

**Catalogue
of earthquakes and tsunamis
in the Mediterranean area
from the 11th to the 15th century**

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Foreword

This monograph is the product of years of research, and I consider it to have great value and to be of particular scientific importance. The sheer breadth of the area investigated — nineteen different countries are involved and the time span from the 11th to the 15th century called for a number of long and complex research projects funded by the *Istituto Nazionale di Geofisica e Vulcanologia* (INGV) starting from 1994, the year of publication of the previous volume (*Catalogue of ancient earthquakes in the Mediterranean area up to the 10th century*), up until 1999. All the work of reviewing, supplementing and updating, together with computerised cartography, has been carried out independently by the *Storia Geofisica Ambiente* (SGA) team, who gave continuity to the research pursued during those years.

These two catalogues make a contribution of international importance to the seismology of the Mediterranean area, and in some respects carry forward a trend that has become increasingly marked over the past decade. Increasingly earth science studies have been crossing national boundaries: it is beginning to be realised that certain great environmental catastrophes cannot be understood without referring to the whole of the geographical area affected — as has been dramatically illustrated by the hugely disastrous tsunami of 26 December 2004 in the Indian Ocean. The fact that geodynamic phenomena take no account of national boundaries is of vital importance when dealing with extreme natural events in history, for the fragmented nature of their effects means that they must all be studied and interpreted in strict relation to their cultural, social and economic context.

The authors have in some ways anticipated the heightened interest in tsunamis following the disaster of 26 December 2004 by focusing on them both in this volume and the previous one. As can be seen from tsunamis like the ones occurring in 1202 and 1303, the Mediterranean is also the scenario for phenomena whose effects may now be offset thanks to research and modern technology. To those who witnessed them in centuries past, such events must have seemed terrifying, inescapable, and largely inexplicable. As this new catalogue demonstrates, historical research can throw crucial fresh light on these phenomena. We now know that great earthquakes and great tsunamis are likely but rare events in the Mediterranean area, and for this reason that we must push our investigations very far back in time.

This volume draws to a close a research cycle whose unitary nature is a consequence of the very history of the Mediterranean area in the centuries being examined: the 15th century was chosen as an important historical and cultural watershed (in 1453 the fall of Constantinople saw the end of the Byzantine Empire). The considerable seismic and volcanic activity of those five centuries was accompanied by a substantial loss of historical information, leading to real difficulties in studying and understanding the dynamics involved. This catalogue lies chronologically in between two quite different ages: at one extreme we have the beginning of modern times — and hence of more readily available data — while at the other we look back to the early Middle Ages and the ancient world, the latter being the subject of archaeoseismological and palaeoseismological investigations. So here we have some important pieces to fit into the jigsaw, and I certainly hope the catalogue will encourage the scientific community to make use of the data provided and also to embark on new research.

Enzo Boschi

*President of the
Istituto Nazionale di Geofisica e Vulcanologia*

Preface

The many years of research that underpin this catalogue began immediately after the publication of the first volume in 1994 (*Catalogue of ancient earthquakes in the Mediterranean area up to the 10th century*). Thus the time range of this second volume naturally follows on from the first one, covering the period from the 11th century until the end of the 15th. The fall of Constantinople in 1453 and the Turkish occupation constitute an important turning point in the history of the Mediterranean, affecting source types and the way information circulated. Our intensive research lasted a number of years, leading to results that were ready for publication in the year 2000. However, when the *Istituto Nazionale di Geofisica* took on a new institutional form in 1999, adding *Vulcanologia* to its name, different publishing policies were put in place at INGV, which meant that publication plans for this catalogue were halted from 2001 to mid-2004. During those years, however, the authors of the catalogue continued to update their bibliography and track down new editions of sources. Manuscript research and new source editions also continued without interruption, leading to additional information and the new interpretation of some major earthquakes, which became the subject of a number of specific publications (e.g. the Syrian earthquakes of 1138, 1156-1157, 1170, that of 1117 in Italy, as well as a score of earthquakes unknown to current catalogues).

It is true that this catalogue is being published a good deal later than planned, and that it has undergone certain modifications. We decided, for example, not to publish the long and complex introduction that had been planned, or our iconographical research, but the delay has nevertheless produced some rather positive results: it has enabled us to carry out a more thorough review of our results and to examine certain matters in greater depth. The cartography has also improved in certain respects, and now appears in a new guise.

Although this complex and stratified catalogue covers an area now occupied by 19 countries, it can never be claimed that the work is complete. The levels of knowledge provided here are indeed different for different seismic events and tsunamis: in some cases the data make it possible to provide fairly detailed scenarios of effects, while in others it is not even possible to calculate the parameters. In the latter cases, at least the established chronological indicators remain, and may allow scholars to embark on new research. So this is an open-ended work, in two ways at least:

- i) all the historical data that we have worked on and interpreted are presented in the original languages;
- ii) the updating of our knowledge base to 2004 may well foster the advancement of other research work.

In general we have tried to stick to what we consider to be one of the basic principles of historical seismology, namely clear and controlled decision-making in the process of assessing historical earthquakes. We have also aimed to stir up an interest in historical seismological research as a valuable aid to seismological and palaeoseismological analyses. Medieval historians interested in the Mediterranean area can make good use of the information about the history of territories and environments which they approach from different standpoints. The persistence and destructive force of earthquakes and the impact of tsunamis have left deep scars in the cultures and economies of medieval Mediterranean societies.

Historical sources and works used

The texts of historical sources are provided in this catalogue in their original languages. There sources are in several different languages (Greek, Latin, Arabic, Hebrew, Armenian, Syriac, Italian, French, German etc.). In order to understand seismic acti-

vity in the Mediterranean area in medieval times, primary evidence is obviously not enough on its own, though we think it an essential part of a catalogue. Such information also has to be put into its context and related to other aspects of historical demography, and the sites mentioned in the sources have to be located. In our opinion, that is the only way that assessments of earthquake effects can have a meaning and a consistency where there is a dearth of information. All the data in this catalogue have been subjected to *ex novo* analysis and interpretation, involving a close dialogue with other studies in seismological literature.

Although the results obtained cannot, strictly speaking, be described as definitive owing to the nature of the research involved, we have thought fit to give scholars and researchers the benefit of such advances as we have made. In addition, the catalogue makes it possible to systematise a tradition of catalogues and studies that is very frequently confusing, and far from faultless.

The basic sources have been identified by means of dedicated research work carried out by a work group set up for the purpose. The researchers and experts have worked on specific projects, carried out at different stages, with a view to locating, selecting and translating the historical sources. We have not only paid attention to the sources, but also to analysing the existing knowledge. In the case of many large earthquakes, there is a history of their interpretation that can be found in the scientific literature, but so scattered it has nearly always been ignored. We have taken these histories into account, hopefully with due clarity, in order to show how the interpretations of an earthquake substantially reflect the underlying level of historical understanding. The fact is that by honing our historical knowledge, whether through textual or non-textual evidence (population rates, types of building, particular political or military situations, etc.) it is nearly always possible to achieve new levels of interpretation.

The events described

This catalogue contains information, with different levels of analysis, relating to 383 earthquakes, 22 tsunamis, and 102 environmental effects. The seismic effects located are 1344 and concern towns, villages, and castles in the Mediterranean area, situated within 19 present-day Countries.

We have tried to make every entry as complete as possible, as concerns the historical sources selected. Within the heading for each individual entry, the reader can review the texts that have been used to analyse the event, ranging from historical sources to the relevant literature, historiography and catalogues.

For a summary assessment of the earthquakes and tsunamis analysed in this catalogue, the reader should refer to the general maps and parametric catalogues included at the end of the volume. For an overall picture of the density of seismic events across the centuries, regardless of the countries where the effects were felt, see the graph at the beginning of the *Short Catalogue* (p.827).

The catalogue team

The authors of this catalogue have enjoyed the collaboration of text scholars and researchers working in oriental languages. The task of selecting the sources began in 1992; some of our researchers are now established lecturers at Italian universities, but when they were helping on this project they were mostly post-graduates or researchers. Since it was impossible to adopt a systematic approach for all language areas, we set up some basic research projects which gradually developed over time, partly in relation to the allocation of funds for the various projects involved in the INGV research plans. It should be said that this catalogue developed "along the margins" of other research that was at the time reckoned to be more urgent or more important.

The work's complexity, the time required to carry out research and transcribe and interpret the sources as they became identified (often a tortuous and difficult matter),

the identification of the relevant scientific literature and catalogues, and the careful evaluation of the seismological results obtained, meant that the task of compiling the catalogue was a very lengthy one. Inevitably there were changes of collaborators in some language areas: but such changes were offset, so to speak, by the fact that we ourselves carried on with the incessant checking of the philological and codicological literature, the manuscripts and new editions of sources. During its long period of preparation, this catalogue has been like a "laboratory" where we have endlessly tried to improve its every aspect, deal with uncertainties, solve problems. On the one hand, the amount of time needed has allowed us to produce results that are original and, we hope, not too short-lived, but it has also meant that we actually ran the risk of losing sight of a comprehensive single approach to the sources, so we were obliged to reopen certain areas of study more than once, thereby going well beyond the remit of the current projects carried out on behalf of INGV. It is with a certain degree of satisfaction therefore, that we now present all this information — the fruit of over a decade of intense teamwork. We have decided not to give our collaborators' current academic qualifications, because in many cases that would mean misrepresenting the original nature of the group, which at the time consisted of talented young researchers who worked with us enthusiastically as well as confidently, especially in the years between 1992 and 2000. We list them below by language and theme:

<i>Antonio Rigo</i>	(University of Venice) carried out a critical review of the Byzantine sources already recorded by SGA researchers, and added to them;	GREEK
<i>Roberta Scopece</i>	carried out systematic research into the Greek codices at the Biblioteca Apostolica Vaticana;	
<i>Adalberto Magnelli</i>	(Italian School of Archaeology at Athens and University of Florence) carried out a complex piece of research into Byzantine inscription sources.	
<i>Leonardo Capezzone</i>	(Università La Sapienza, Rome) and	ARABIC
<i>Roberta Denaro</i>	(Università di Messina): selected and transcribed the texts of published Arabic sources;	
<i>Nouha Stéphan</i>	transcribed manuscript Arabic texts in the Bibliothèque Nationale de France.	
<i>Claude Detienne</i>	(University of Louvain) and	SYRIAC
<i>Gianfrancesco Lusini</i>	(Università Orientale of Naples) supplemented and reviewed the Syriac sources already recorded by SGA researchers.	
<i>Giusto Traina</i>	(University of Lecce) and	ARMENIAN
<i>Igor Dorfmann-Lazarev</i>	(Université Paul Valéry, Montpellier) selected and translated Armenian texts and inscriptions.	
<i>Federico Maruzzi</i>	(Università Suor Orsola Benincasa, Naples) selected and translated the texts from the <i>Recueil des Historiens des Croisades – Historiens Occidentaux</i> .	LATIN CRUSADE CHRONICLES
<i>Nadia Zeldes</i>	(Jewish National and University Library of Jerusalem) transcribed and translated published and manuscript Hebrew sources.	HEBREW

In the case of earthquakes in Italy, we reviewed, deepened and added to all the earlier studies, most of which published in the *Catalogue of Strong Italian Earthquakes from 461 B.C. to 1997* (Boschi *et al.* 2000, and further releases on the web site <http://storing.ingv.it/cft/>). The results presented here are thus an update to the above-mentioned catalogue.

In addition, the following researchers played an important part in our working group:

- Cecilia Ciuccarelli* helped us with the final draft and the editing of the catalogue. She took part in several discussions as we sought to solve the many problems presented by the text;
- Dante Mariotti* located the most difficult place names, and collaborated with us in estimating the parameters;
- Filippo Bernardini* collaborated with us at an early stage in classifying the seismic effects; he also developed some of the seismotectonic aspects for the 12th century earthquakes in Syria (see Guidoboni *et al.* 2004);
- Maria Giovanna Bianchi* produced the large-scale maps of urban effects, the graphs and the digitalisation of the illustrations; she also collaborated in the final editing stage;
- Maria Luisa De Simone* dealt with the index of names and places;
- Brian Phillips* translated the texts and sources into English with the skill and accuracy that typify his work.

CARTOGRAPHY The thematic cartography was done by *Gabriele Tarabusi* using MapInfo Professional (www.mapinfo.com) software. The relief cartographic bases have been made by *Marco Gualdrini* (GEOgrafica, Faenza), using *Visual Nature Studio 2.5* software (3dNature LLC, www.3dnature.com), on the base of the geo-referenced terrain altimetric data. The general cartographic base of the Mediterranean is derived from the GTOPO30 Digital Elevation Model (U.S. Geological Survey EROS Data Center) resampled at the resolution of 500 m × 500 m in x and y. For the detail of the Italian territory a cartographic base elaborated from the Digital Terrain Model of the INGV was used: the cell size of the grid is 250 m × 250 m. The various ground models have been depicted in planimetric views with shaded-relief techniques using multiple lights, to improve the graphic quality of the three-dimensional relief.

Earthquakes in the Sea of Marmara were reviewed and examined as part of the RELIEF (*Reliable Information on Earthquake Faulting*) European project "I.1.1. Seismic Risks" EVG1-CT-2002-00069, responsible for INGV dr Daniela Pantosti.

The contributions to this Catalogue have entailed coordination with various work groups at different stages. Wide-ranging and decisive though these have often been, it is the authors who take full responsibility for any errors or omissions in the data presented here.



V
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cui
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neq
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totu

nito similis omnium rerum

CATALOGUE

Legend

ENTRIES

DATES Dating systems are indicated whenever the sources only give the year.

- H. Hegira
- A. e. Armenian era
- B. s. Byzantine style
- I. s. Incarnation style
- S. e. Seleucid era
- / separates two alternative dates or periods of years
- joins the beginning and end of a chronological period

PLACE NAMES Ancient names are preserved (the names cited by the historical sources are kept; modern equivalents are used in the list of parameters; see also the table concerned; the present-day nations to which they belong are also specified.

REFERENCES

- sources 1 Authoritative contemporary texts which can be defined as "direct sources", using that expression in its specifically historiographical sense. This category may include later texts, if they make use of earlier lost traditions and add important details.
- sources 2 Authoritative, but not contemporary texts, which derive from an earlier textual tradition ("indirect sources"). This category makes it possible to evaluate the tradition and fame of an earthquake in later centuries. A source in "sources 2" does not necessarily depend on one from "sources 1". There may be intermediate sources or parallel traditions which have been lost or are not always known.
- inscriptions Texts written on durable materials; ■ indicates the explicit and direct evidence of an earthquake; □ indicates the indirect or deduced evidence of an earthquake.
- literature Scientific studies and references, arranged in chronological order, which directly or indirectly relate to the earthquake in question. In particular cases, studies are used to obtain more accurate datings, locations, or features of the economic and demographic situation in the affected area. Seismological, palaeoseismological and geological articles about the area in question are not included unless they are strictly correlated to the particular earthquake concerned.
- historiography Historical studies, ranging from antiquarian and erudite historiography (16th – 18th centuries) to the most recent local histories. The works cited either provide evidence of a particular earthquake tradition within a historical context, or local place-name information, or information about the history of buildings and monuments.
- catalogues d. Descriptive catalogues, i.e. catalogues containing qualitative data or descriptions of effects, and/or comments on the sources utilised and/or the text of the sources themselves. Such studies vary greatly in quality: the category includes both pre-modern and more recent catalogues. Arranged in chronological order.
 - * Indicates that a catalogue is not only descriptive but includes parameters as well.
- catalogues p. Parametric catalogues only; post-1960s, arranged in chronological order. These are recent works of historical seismology.
- catalogues Ts Tsunami catalogues.

ABBREVIATIONS

- ? indicates uncertainty
- [...] textual matter omitted
- ms., mss. manuscript, manuscripts
- fol., fols. page, pages of a manuscript
- cod. codex

PARAMETERS

- ▲ indicates the recurrent part of the entry where the parameters are to be found
- △ indicates the omission of parameters owing to a lack of basic information
- ★ epicentre: calculated only when at least four of the classified points are available with intensity grades. The epicentre is computed by using the method of Gasperini *et al.* (1999) and Gasperini and Ferrari (2000); see also web site: <http://ibogfs.df.unibo.it/user2/paolo/www/boxer/boxer.html>
- ★ hypothetical epicentre: only indicated in a few special cases (see text)
- UT Universal Time
- Sites number of localities to which an intensity grade has been attributed
- EE location of environmental effects
- ER volcanic eruption
- Ts tsunami
- lat. latitude in degrees and minutes
- long. longitude in degrees and minutes
- The place names are those currently in use; the countries to which these places belong are indicated only when the area of effects involves more than one country.
- Generically indicates an area or a region; we have used this symbol so as not to disperse the information, which might be subject to further research.
- MCS Mercalli Cancani Sieberg scale: it has been adopted as more appropriately "calibrated" for historical earthquakes in the Mediterranean area. See Ferrari and Guidoboni (2000) and the analyses carried out by Sieberg (1932c). The MCS scale has twelve degrees. We have added the following elements:
- F felt
- NF not felt
- NC not classified
- Furthermore, when the damage is only recalled by historical sources for a single monumental building (churches, cathedrals, castles and palaces) this is classified by means of letters to indicate that the degree attributed is different from that required by the scale (all the buildings at a site taken together). In these cases, the intensity given is to be understood as an assumed value for that site, and relates to the following rough classification:
- A (IX) collapse and/or extensive damage to load-bearing walls;
- B (VIII) collapse limited to the top of the building (lantern, cupola, gable, towers, bell-towers);
- C (VII-VIII) partial collapse of the roof, vaults, apsidal vault, etc.;
- D (VI-VII) falling eaves, cracking, or general indications of damage to the building which has not prevented it from being used.
- I macroseismic intensity
- Io epicentral intensity; this has been determined with the aim of using this parameter as a homogeneous tool for the measurement of the earthquake size
- Imax maximum intensity (in the *Short Catalogue*)
- Me equivalent magnitude value, calculated using the method of Gasperini *et al.* (1999) and Gasperini and Ferrari (2000); see also web site: <http://ibogfs.df.unibo.it/user2/paolo/www/boxer/boxer.html>; in the case of a few earthquakes, the experimental version made available by P.Gasperini has been used.

SYMBOLS and
ABBREVIATIONS

PLACE NAMES





INTENSITY
and
MAGNITUDE









ABBREVIATIONS Present-day States; for the areas of current government instability we have followed the United Nations nomenclature.

A	Austria	HR	Croatia
AL	Albania	I	Italy
AM	Armenia	IL	Israel
AZ	Azerbaijan	IR	Iran
CY	Cyprus	IRQ	Iraq
CZ	Czech Republic	MA	Morocco
D	Germany	RL	Lebanon
DZ	Algeria	SA	Saudi Arabia
E	Spain	SCG	Serbia and Montenegro
ET	Egypt	SYR	Syria
F	France	TN	Tunisia
GR	Greece	TR	Turkey
GS	Gaza Strip	WB	West Bank
HKJ	Jordan		

MAPS

PLACE NAMES Ancient names are preserved in order to facilitate reference to the source texts.

- SYMBOLS
-  calculated epicentre
 -  hypothetical epicentre
 -  local effects, when the epicentre cannot be calculated
 -  archaeological site or site now deserted

- ENVIRONMENTAL EFFECTS
-  tsunami
 -  landslide
 -  ground breakage, fissures
 -  clouding of springs
 -  changes in the flow of springs, appearance or disappearance of spring
 -  changes in water chemistry
 -  exhalation or emission of gases
 -  overflow, watercourse changes

Ancient and modern place names

The ancient names of sites are listed in alphabetical order, followed by the modern name, and by the State to which the locality currently belongs. Any name variants are in brackets. Arabic and Armenian names have been simplified by omitting diacritical signs. Sites which have kept their ancient name are not listed.

- A**cre: Akko, Israel
Adalia: Antalya, Turkey
Afamiyah (Apamea): Qalat al Madiq, Syria
Aila (Aylat): Elat, Israel
Akhlal: Akhlal'yan, Armenia
Akhlal (Xlat'): Ahlat, Turkey
Al-Ruha (Edessa): Urfa, Turkey
Ani: near Ocakli, Turkey
Antimachia: Andimakhia, Greece
Apamea (Afamiyah): Qalat al Madiq, Syria
Arces: Ercis, Turkey
Archis ('Arqa): Mathanat ad Dulbah, Lebanon
Arima: Qalat al Uraymah, Syria
Ark'akalin: Peri Kalesi, Turkey
'Arqa (Archis): Mathanat ad Dulbah, Lebanon
Ascalon: Ashqelon, Israel
Atharib (Cerepum): Al Atarib, Syria
Aurana (Urana): Vrana, Croatia
Aylat (Aila): Elat, Israel
'Ayntab: Gaziantep, Turkey
Balatunus: Qalat al-Mahalibah, Syria
Bar Sauma: Borsum Kalesi, Turkey
Basra (Busra): Al Basrah, Iraq
Beroia: Veroia, Greece
Biza'ah: Bzaa, Syria
Borgo San Sepolcro: Sansepolcro, Italy
Brusa (Prusa): Bursa, Turkey
Busra (Basra): Al Basrah, Iraq
Busra: Busra ash Sham, Syria
Balis: Maskanah, Syria
Calino: Kalimnos, Greece
Callinicus (Raqqah): Ar-Raqqah, Syria
Candia: Iraklion, Greece
Castelluccio Acquaborrana: Castelmauro, Italy
Cefalo: Kefalos, Greece
Cerepum (Atharib): Al Atarib, Syria
Cerines: Kyrenia, Cyprus
Cesara: Shayzar, Syria
Chastel Blanc: Safita, Syria
Chliara: near Kirkagaç, Turkey
Chora: Hösköy, Turkey
Constantinople: Istanbul, Turkey
Corone: Koroni, Greece
Cotrone: Croton, Italy
Crac des Chevaliers (Hisn al-Akrad):
 Qalat al Hisn, Syria
Cyzicus: near Erdek, Turkey
Damietta: Dumyat, Egypt
Delnk'ar (Lambrun): Camliyayla, Turkey
Dulcigno: Ulcinj, Serbia and Montenegro
Dyrrachium: Durrës, Albania
Edessa (Al-Ruha): Urfa, Turkey
Emesa: Hims, Syria
Erznka: Erzincan, Turkey
Fossaceca: Fossalto, Italy
Gabala (Gabulum): Jablah, Syria
Gabulum (Gabala): Jablah, Syria
Galaxidi: Galaxidhion, Greece
Galenolimen (Galimi): Çınarlı, Turkey
Galimi (Galenolimen): Çınarlı, Turkey
Gallipolis: Gelibolu, Turkey
Ganos: Gaziköy, Turkey
Ganzak: Ganca, Azerbaijan
Ghundjara: Cankiri, Turkey
Gibelacar: Akkar al Atiqah, Lebanon
Hagar Suglan: Sivlan Kalesi, Turkey
Hama (Hamat): Hamah, Syria
Hamat (Hama): Hamah, Syria
Hamus: Çardak, Turkey
Hisn al-Akrad (Crac des Chevaliers):
 Qalat al Hisn, Syria
Humana: Numana, Italy
Iadera: Zadar, Croatia
Kelargom: near Horomosvank', Turkey
Keysun: Cakirhuyuk, Turkey
Kufa: Al Kufah, Iraq
Lambrun (Delnk'ar): Camliyayla, Turkey
Lango: Kos (island), Greece
Laodicea: Al Ladhiqiya, Syria
Lepanto: Nafpaktos, Greece

Lero: Leros, Greece
 Lopadium: Uluabat, Turkey
 Lydda: Lod, Israel
 Lysimachia: Orta Köy, Turkey
Madytus: Eceabat, Turkey
 Mamistra: Yakapinar, Turkey
 Mansur: Adiyaman, Turkey
 Mar'ash (Maresia, Mariscum): Maras, Turkey
 Maresia (Mar'ash, Mariscum): Maras, Turkey
 Margat: Al Marqab, Syria
 Mariscum (Mar'ash, Maresia): Maras, Turkey
 Mayafariqin: Silvan, Turkey
 Melitene: near Malatya, Turkey
 Modone: Methoni, Greece
 Mohac: Modica, Italy
 Mola: Formia, Italy
 Myriophytus: Murefte, Turkey
Nablus: Nablus, Israel
 Narangia: Kos (city), Greece
 Nea Phocaea: Yenifoça, Turkey
 Negroponte: Euboea, Greece
 Nicea: Iznik, Turkey
 Nisibin (Nisibis): Nusaybin, Turkey
 Nisibis (Nisibin): Nusaybin, Turkey
 Noraduz: Noratus, Armenia
Palmyra: Tudmur, Syria
 Panium: Barbaros, Turkey
 Pergamum: Bergama, Turkey
 Pescolamazza: Pesco Sannita, Italy
 Pettorano: Pettoranello del Molise, Italy
 Philadelphia: Alasehir, Turkey
 Pili: Pylon, Greece
 Prusa (Brusa): Bursa, Turkey
Ragusa: Dubrovnik, Croatia
 Raqqa (Callinicus): Ar-Raqqah, Syria
 Resina: Ercolano, Italy
 Rhaedestus: Tekirdag, Turkey
 Ripalimosano: Ripalimosani, Italy
 Rocca di Bantra: Rocca d'Evandro, Italy
 Roccavalleoscura: Rocca Pia, Italy
Safad: Zefat, Israel
 Saline: Larnaca, Cyprus
 Salona: Amfissa, Greece
 Samosata (Sumaysat): Samsat, Turkey
 San Germano: Cassino, Italy
 Santa Maura: Lefkas, Greece
 Santorini: Thera, Greece
 Sarbanda (Sarvandik'ar): Savuran Kalesi, Turkey
 Sarvandik'ar (Sarbanda): Savuran Kalesi,
 Turkey
 Sebaste: Niksar, Turkey
 Shatax: Çatak, Turkey
 Shubak: Ash Shawbak, Jordan
 Sidon: Sayda, Lebanon
 Solun: Thessaloniki, Greece
 Stauròs: Beylerbeyi, Turkey
 Sumaysat (Samosata): Samsat, Turkey
Tenedos: Bozcaada, Turkey
 Tortosa: Tartus, Syria
 Traetto: Minturno, Italy
 Trihalet: Akçakoyunlu, Turkey
 Tzouroulos: Corlu, Turkey
Urana (Aurana): Vrana, Croatia
Vitrinitsa: Tolofon, Greece
 Vodena: Édhessa, Greece
 Vostitsa: Aigion, Greece
Xlat' (Akhlat): Ahlat, Turkey
Zacynthus: Zakynthos, Greece
 Zakholi: Evrostina, Greece
 Zaradna: Zardana, Syria

< 001 > 1002 November 10 – 1003 October 29 [393 H.] Syria

source Ibn Taghribirdi, *al-Nujum*, IV, p.307
literature Taher (1979); Poirier *et al.* (1980)
catalogues p. Ergin *et al.* (1967); Poirier and Taher (1980); al-Hakeem (1988)

Between 10 November 1002 and 29 October 1003, a strong earthquake struck the Syrian territories and nearby coastal regions, causing severe damage in an unspecified number of places, and killing many people. The earthquake is recorded by Ibn Taghribirdi, a late but reliable Arab historian of the 15th century:

“In that year [393 hegira = 10 November 1002 – 29 October 1003], the earth shook in the Syrian territories, in the principal towns and along the coast; and there were many victims in the ruins”.

١ وفيها زلزلت الشام والمواصم والشغور فمات تحت الهدم خلق كثير.

^ There are no elements with which to indicate the parameters.

< 002 > 1003 March 21 – 1004 March 19 [452 A. e.] Edessa area
[central and southern Turkey]

sources 1 Matth. Edess., *Chron.*, 1.35; Sam. An., *Comp.*, p.104
source 2 Smbat, *Ann.*, p.22
historiography Röhricht (1898); Kostaneanc' (1902); Yeomans (1991)
literature Abich (1882)
catalogues d. Step'anyan (1964); Zeyt'unyan (1991)
catalogues p. Ergin *et al.* (1967)

In the year 452 of the Armenian era (21 March 1003 – 19 March 1004), a strong earthquake struck the principality of Edessa (present-day Urfa), which lay in what is now central and southern Turkey. The sources do not provide details of the damage caused, but we are told that there were many victims.

The principal source is Matthew of Edessa, who had personal experience of events in the crusader principality of Edessa in the early 12th century, and compiled a chronicle covering the period 952-1132.

Matthew of Edessa's chronicle records:

“During the reign of emperor Basil II the Greek [976-1025], and in the year 452 of the Armenian era [21 March 1003 – 19 March 1004], a certain fiery star arose in the heavens, as an omen of the wrath of God towards all living creatures and also a sign of the end of the world. There was a violent earthquake throughout the whole land, to such an extent that many thought the day of the end of the world had arrived. As at the time of the flood, all living creatures shook and trembled, and many fell down and died from fear of the intensity of this wrath”.

Դարձեալ ՚ի յաւուրս վապի Յուսաց Թագաւորին և ՚ի շայոց Թուականութեանն ՆՃԲ, ամի ելանէր աստղ մի ՚ի տեսիլ հրոյ Երեւեալ ՚ի երկինս, նշան բարկութեան արարածոց և կատարածի աշխարհի: Եւ եղեւ շարժ սաստիկ ընդ ամենայն երկիր, մինչեւ կարծել բազմաց՝ Լիթե հեաս օրն վերջին և կատապաց աշխարհի, և որպէս առ ջրհեղեղաւ՝ երեւեալ դողաց ամենայն արարած. յահէ և բարբառայ բարկութեանն ոչ ժամանէին յոստովանութեան և հաղորդութեան:

This passage from Matthew of Edessa does not justify placing the earthquake at the beginning of the Armenian year, as Ergin *et al.* (1967, p.16, no.121) seem to suggest by dating it to 1003. Matthew's information only gives us chronological limits (the Armenian year 452) within which the earthquake occurred. That it struck the region of Edessa is very likely, as Abich (1882, p.436) pointed out.

Matthew's reference to a comet being seen in the same year as the earthquake is confirmed in an authoritative study by Yeomans (1991). He points out that between December 1003 and January 1004 a comet was indeed observed both in Asia and Europe.

The earthquake is recorded by later authors at a variety of dates. The Armenian chronicler Samuel of Ani (1113-66) records:

"1007. There came a star of fiery aspect and with it an earthquake".

ն.է. ել ասող մի ի տեսիլ հրոյ՝ որոյ հետ եղև շարժ սաստիկ.

Smbat (1208-1276), an Armenian historian from Cilicia who usually takes Matthew of Edessa as his source, gives a later date, namely the Armenian year 457 [19 March 1008 – 18 March 1009], and he does not tell us where the earthquake occurred.

Step'anyan (1964, p.49ff.) thought Matthew of Edessa and Samuel of Ani were referring to two different earthquakes. Zeyt'unyan (1991, p.52) is mistaken in suggesting that the earthquake occurred at Constantinople. His mistake derives from the fact that he took as his source the work of Smbat, who records the earthquake as occurring during the reign of Basil in Byzantium (as indeed Matthew of Edessa had done before him), but without indicating a location.

△ There are no elements with which to indicate the parameters.

< 003 > **1010 January Constantinople [north-western Turkey]**

< 004 > **1010 March 9 Constantinople**

sources 1 Attal., *Hist.*, p.90; Scyl., *Synopsis*, pp.347-8

sources 2 Cedren., *Synopsis*, II, pp.456-7; Glyk., *Ann.*, p.587

literature Janin (1969); Müller-Wiener (1977); Ducellier (1980)

catalogues d. Bonito (1691); von Hoff (1840); Perrey (1850); Mallet (1853); Dück (1904); Downey (1955); Galanopoulos (1955); Grumel (1958); Ambraseys and Finkel (1991); *Papazachos and Papazachou (1997)

catalogues p. Ergin *et al.* (1967); Shebalin *et al.* (1974)

In January 1010, there was a strong earthquake at Constantinople, followed by a series of minor shocks lasting until 9 March of that year, when another violent earthquake struck the city. This second powerful shock caused the collapse of the domes of the church of Forty Martyrs and that of All Saints, both of which were restored by the emperor Basil II (976-1025). This seismic sequence was interpreted as a forewarning of later political instability in Italy, and it led Basil II to appoint a single catapan there. Information about these earthquakes is to be found in Scylitzes, a Byzantine historian who lived in the second half of the 11th century:

"And in the month of January in the same [eighth] indiction [1 September 1009 – 31 August 1010] there was a terrifying earthquake, and the earth continued being shaken until 9 March. On that date, at the tenth hour of the day, there was a thunderous noise and a terrible earthquake both in the capital and the *themata*; and the domes of the church of the Forty Martyrs and of that of All Saints collapsed, and the emperor rebuilt them immediately. This was a forewarning of the coming rebellion in Italy".

καὶ Ἰαννουαρίῳ μηνὶ τῆς αὐτῆς ἐπινημήσεως γέγονε σεισμὸς φρικωδέστατος, καὶ διεκράτησε κλονουμένη ἡ γῆ μέχρι τῆς ἐννάτης τοῦ Μαρτίου μηνός. ἐν ταύτῃ δὲ περὶ δεκάτην ὥραν τῆς ἡμέρας γέγονε βρασμὸς καὶ κλόνος φρικτὸς κατὰ τε τὴν βασιλίδα καὶ ἐν τοῖς θέμασι, καὶ πεπτώκασιν αἱ σφαῖραι τοῦ ναοῦ τῶν ἁγίων τεσσαράκοντα καὶ τῶν ἁγίων πάντων. ἃς ὁ βασιλεὺς εὐθὺς ἀνεκτίησατο. ταῦτα δὲ προεμήνυε τὴν μετὰ ταῦτα γενομένην ἐν Ἰταλίᾳ στάσιν.

The same item of information is taken up by Cedrenus (late 11th – early 12th century) and, in a slightly abbreviated, form, by Glycas (12th century).

There may be a reference to these earthquakes of 1010 in Attaliates, an 11th century Byzantine historian, according to whom, at the time of the seismic sequence of September 1063 – September 1065, elderly people in Constantinople recalled a “great earthquake” involving very strong earthquakes, which had lasted for forty days. If we assume that the January earthquake occurred towards the end of the month, then there would be about forty days between the first shock and that of 9 March. Attaliates writes:

“For two years after that time, sporadic shocks occurred on various occasions, and men were greatly amazed by them. Certain elderly people recalled that two of these earthquakes resembled the “great” earthquake; some said the latter had been more powerful, while others thought the former to have been greater. They said, in fact, that the earlier shocks had been by no means briefer, lasting for forty days”.

Ἀπὸ τότε δὲ καὶ μέχρις ἐνιαυτῶν δύο σποράδες ἐπεφοίτων σεισμοὶ κατὰ διαφοροῦς καιροῦς. καὶ τὸ θάμβος μέγιστον ὅσον περιεγίνετο τοῖς βροτοῖς. ἦσαν γάρ τινες ἔξωροι, οἱ παρεοικότας σεισμοὺς τῷ μεγίστῳ δύο ἀνέφερον, οἱ μὲν τοῦτον οἱ δ' ἐκείνους κατὰ σύγκρισιν ὑπεραίροντες. καὶ παρηκολουθωκέναι τότε δι' ἡμερῶν τεσσαράκοντα καὶ μὴ πλείω βραχεῖς τινὰς προσεπέφερον.

As regards buildings in Constantinople damaged by the earthquake shocks, we can specify that the church of All Saints was close to that of the Holy Apostles (Janin 1969, pp.389-90; Müller-Wiener 1977, p.405). There were various churches in Constantinople dedicated to the Forty Martyrs (Janin 1969, pp.482-6). The building in question is likely to have been that near the Chalkoun Pylon (πλησίον τοῦ Χαλκοῦ Τετραπύλου): see Müller-Wiener (1977, p.191). The earthquake may also have affected other buildings, such as the church of St. Polyeuctes, near that of the Holy Apostles (Müller-Wiener 1977, pp.190-1). The areas generically described as *themata* cannot be identified, because the term *thema* is used to indicate a territorial unit administered by a *strategos*. Scylitzes' expression may therefore refer to territory anywhere in the Byzantine empire, from southern Italy to Armenia.

Galanopoulos (1955, p.101) maintains, without explanation, that the earthquake occurred at Gallipoli (Gelibolu). Ambraseys and Finkel (1991, p.536), date the sequence to 1011 on the authority of Cedrenus alone. The information about Gallipoli which Papazachos and Papazachou (1997, p.190) associate with the earthquakes of 1010 is in fact to be related to the earthquake of 1354: Nicephorus Gregoras, being a 14th century source, obviously cannot have had personal experience of an earthquake occurring in the 11th century.



1010 01 –

localities	lat.	long.	I
Istanbul	41 02	28 57	V

1010 03 09

localities	lat.	long.	I
Istanbul	41 02	28 57	VII

< 005 > **1011 Erzinka [eastern Turkey]**

- sources 1 Mich. Syr. Arm., *Chron.*, pp.400ff.; Mxit' Ayriv., *Hist.*, p.57
inscription Alishan (1881, pp.32ff.)
sources 2 *Chron. min. Arm.*, II.24, p.502; colophon in Hakobyan (1956, p.503, no.6)
historiography Hakobyan (1956); Duce'llier (1980)
catalogues d. Kostancanc' (1902); Step'anyan (1964); Zeyt'unyan (1991); Guidoboni and Traina (1995)
catalogues p. Ergin *et al.* (1967); Karapetian (1991); Shebalin and Tatevossian (1997); Berberian (1997)

In the year 1011, the Armenian city of Erzinka (now Erzincan, in Turkey), was struck by an earthquake described as "dreadful", preceded by a disastrous flooding of the river Euphrates. We do not know what effect the earthquake had, though it probably aggravated the damage caused by the preceding flood. Mxit'ar Ayrivanec'i is mistaken in reporting widespread total collapses. He is in fact attributing to this earthquake the effects both of the flood and of the later earthquake at Erzinka in 1045 (see the entry concerned). This is the first of a series of earthquakes at the Armenian city of Erzinka recorded in some of the seismological as well as the historical and antiquarian literature. The principal report of the earthquake is to be found in the Armenian translation by Isox (13th century) of the reliable chronicle of Michael the Syrian (1126-1199):

"During the reign of Ablabas [Abu 'l-Abbas] over the Tacikk' [Arabs and Turks], Eznkay was engulfed by the waters, and the only house left was that of an upright and merciful man called Kirakos. And in the same year there was a dreadful earthquake, at the time of the vigil [before the fast]".

Իսկ զթագաւորութիւնն Տաճկաց ունէր Ապլապաս՝ յորում աւուր բնկղմեցաւ ջրոց եզնկայն, և մնաց տուն մի. ուղղափառի և ողորմածի առն, որում անունն էր Կիրակոս: Եւ ՚ի նոյն ամի եղև շարժ անագին ՚ի պահք առաջաւորաց:

Mxit'ar Ayrivanec'i (13th century), an Armenian historian from Yerevan, records:

"Violent earthquake, at the time of the vigil [before the fast]. Eznkay was entirely swallowed up, and only the house of Kirakos the Merciful was left standing. Many churches and fortresses were destroyed".

Շարժ սաստիկ յառաջաւորին. բնկղմեցաւ եզնկայ ողջոյն, և մնաց միայն տունն Կիրակոսի ողորմածին: Բազում եկեղեցիք և բերդք տապալեցան:

Mxit'ar derived his account partly from Michael the Syrian, but his text is very compressed and consequently ambiguous. Mxit'ar is the only author cited by Step'anyan (1964, p.50), who proposes 1011-1012 as the date of the earthquake. An anonymous minor chronicle (*Chron. min. Arm.*, II. 24, p.502.17) gives the date as 565 (1016), but the event in question would seem to be the Erzincan earthquake of 1011, as proposed by Hakobyan (1956, p.503, no.6), who also cites a colophon in Yerevan ms. 8481, fol.198r. which gives the same year 565. Zeyt'unyan (1991, p.54) suggested the date 1016 for this event.

▲ 1011 --

localities	lat.	long.	i
Erzincan	39 44	39 30	VI

< 006 > **1013 March 18 - 1014 March 17 [462 A. e.] Halbat [Armenia]**

- inscriptions Alishan (1881, pp.32-3); Khatchatrian (1974, p.47)
historiography Cuneo (1988)
catalogues d. Zeyt'unyan (1991); Guidoboni and Traina (1995)
catalogues p. Berberian (1997)

In the year 462 of the Armenian era (18 March 1013 – 17 March 1014), a violent earthquake caused damage in the area of Ani, one of Armenia's ancient capitals (now in Turkey). It destroyed the church of the Holy Cross at Halbat, and was probably also responsible for severe damage at an unidentified village which must have been close to the monastery of Horomosvank' near Ani, called K'elargom in the sources.

The principal sources for the earthquake are two inscriptions:

■ 1 – Halbat: inscription in the church of the Holy Cross. The inscription was published in French translation by Khatchatrian (1974, p.47), and records the rebuilding of the church three years after the earthquake:

"In 465 [17 March 1016 – 16 March 1017] I, Honovar, son of Mukan, by the grace of God have restored the holy cathedral which was reduced to ruins in a violent earthquake [...]"

□ 2 – monastery of Horomosvank': inscription in the church of Surb Minas. The inscription was transcribed by Alishan (1881, p.32ff.), and although not explicitly mentioning the earthquake, it seems to be referring to it, as Zeyt'unyan (1991, p.53) maintains. The inscription was put in place by Bishop Anania in the year 462 (18 March 1013 – 17 March 1014), and states:

"Seeking refuge in divine forgiveness, I released [the people] from their taxes with great effort, and I took the territory, and the whole of K'elargom was in the holy pact, for the place became a refuge in time of flight, and many others took advantage of the wood and the forage".

...ի ներելն Աստուծոյ ապաւինելով ազատեցի ժեճաւ ջանիւ զհարկ եւ զթաստակ առի եւ զբեղարագոմն իւր գոյիլ ի սուրբ ուխտս վասն ապաւինի տեղի իննելոյ ի փախտեան ժամանակի եւ այլ բազում ինչ աւգտի փայտի եւ խոտի...

The exemptions granted by the bishop probably stemmed from damage suffered by the local population in the earthquake.

The place-name K'elargom has not been identified on the ground, but would seem to refer to a village or small district situated in the vicinity of the monastery. Built between the 10th and 11th century, the monastery "of the Romans" (*Horomosvank'*), was a huge complex situated on the outskirts of the Armenian capital of Ani (Cuneo, 1988, pp.673-9).

▲ 1013 03 18 – 1014 03 17 [462 A. e.]

localities	lat.	long.	I	localities	lat.	long.	I
Halbat ARM	41 06	44 43	B(VIII)	K'elargom TR	40 33	43 37	VII-VIII?

< 007 > 1022 August? Melitene area? [south-eastern Turkey]

source Mich. Syr., 13.5, *Chron.*, IV, p.557

This earthquake is unknown to the seismic catalogue tradition.

Michael the Syrian, a 12th century monk, mentions a violent earthquake in the period 1 October 1021 – 30 September 1022 (probably in August 1022); but he does not explicitly identify its location. Since he was a native of Melitene, which stood near present-day Malatya (south-eastern Turkey), became archimandrite at the monastery of Bar Sauma, which was situated near Melitene, it seems reasonable to suppose that the earthquake struck the Melitene area.

He writes:

"In the year thirteen hundred and thirty-three [of the Greeks, 1 October 1021 – 30 September 1022; error in the manuscript: 1133], there was a violent earthquake".

... րեւո ընդ իւր ընդ իւր ընդ իւր ընդ իւր

101-1023

The likelihood that it occurred in August can be deduced from his reference to prodigies later in his narrative:

"On the same day, in the month of *Ab* [August], a stormy wind blew and buildings were overturned. In the region of Melitene grain and straw were lifted into the air and fell down into the Euphrates".

△ There are no elements with which to indicate the parameters.

< 008 > **1024 March 15 - 1025 March 3** [415 H.] **Andalusia [southern Spain]**

source Ibn Abi Zar', *al-Anis*, I, pp.144-5

literature Taher (1979)

catalogues p. Poirier and Taher (1980)

Between 15 March 1024 and 3 March 1025, the region of Andalusia in southern Spain was struck by an earthquake which caused extensive destruction.

The earthquake is recorded by Ibn Abi Zar', a 14th century Arab historian:

"[415 H. = 15 March 1024 - 3 March 1025] There was a strong earthquake in Andalusia which caused the mountains and the earth to shake. It was so violent that houses were destroyed".

كانت الزلزلة العظيمة ببلاد الأندلس التي هدمت الجبال واضطربت بها الأرض وهدمت الديار من شدتها.

△ There are no elements with which to indicate the parameters.

< 009 > **1026 December 4** **Constantinople [north-western Turkey]**

source al-Antaki, *Dhayl*, p.250

literature Taher (1979)

This earthquake is unknown to the seismic catalogue tradition.

On 4 December 1026, a strong earthquake struck Constantinople, causing many buildings to collapse. The earthquake is recorded by the contemporary Arab historian al-Antaki, but not by Byzantine sources. Their silence, and especially that of Scylitzes, is difficult to explain, since he accurately records various events of the period. On the information available to us, the omission is inexplicable, but there are no grounds for doubting the reliability of al-Antaki, who records:

"In the second year of the reign of Constantine, there was a tremendous earthquake at Constantinople on the 4th day of the month of *Canun I* in the year 417 [4 December 1026]. Many buildings collapsed".

في السنة الثانية من ملك قسطنطين حدثت بمدينة القسطنطينية زلزلة مهولة في اليوم الرابع من كانون الاول الموافق لسنة سبع عشرة وأربعمئة وسقط منها أبنية كثيرة.

▲ 1026 12 04

localities	lat.	long.	I
Istanbul	41 02	28 57	VIII

< 010 > **1032 August 13** **Constantinople [north-western Turkey]**

sources 1 Scyl., *Synopsis*, p.386; Zon., *Epit.*, 17.12.16, III, pp.580-1

source 2 Cedren., *Synopsis*, II, p.500

historiography Mango (1962); Janin (1969); Müller-Wiener (1977); Ducellier (1980)
catalogues d. Bonito (1691); von Hoff (1840); Perrey (1850); Mallet (1853); Dück (1904); Grumel (1958);
Ambraseys and Finkel (1991)
catalogues p. Ergin *et al.* (1967)

Constantinople was struck by a strong earthquake on 13 August 1032 at about 17.45 UT (the first hour of the night). The leper hospital of St.Zoticus and the aqueduct of Valens were both damaged and later restored by the emperor Romanus III Argyrus (1028-1034).

Information about this earthquake comes from two Byzantine historians: Scylitzes (second half of the 11th century) and Zonaras (12th century). Scylitzes simply records: "On 13 August, a Sunday, at the first hour of the night, in the year 6540 [1 September 1031 – 31 August 1032], there was a great earthquake".

Τῆ δὲ τρισκαίδεκάτῃ τοῦ Αὐγούστου μηνός, ἡμέρα κυριακῆ, ὥρα πρώτη τῆς νυκτός, ἐν ἔτει τῷ ἑξακισχιλιοστῷ πεντακοσιοστῷ σαρακοστῷ, γέγονε σεισμός μέγας.

13 August was indeed a Sunday in 1032. This same information is repeated, almost word for word, by Cedrenus (late 11th – early 12th century).

As Ducellier (1980, p.105, note 10) has rightly pointed out, we also have to take into consideration the text of Zonaras — an author who usually makes use of Scylitzes for this period, but who in this particular case adds important items of information concerning disasters which occurred during the reign of the emperor Romanus III Argyrus (1028-1034):

"Some earthquake shocks occurred, which damaged hospices and refuges on opposite shores at Byzantium which had for a long time provided shelter for people whose bodies were crippled with epilepsy and leprosy. The emperor rebuilt them, also dealing with damage to the aqueduct which supplied the Great City".

σεισμῶν δὲ γενομένων ξενῶντες τε κακῶς διετέθησαν καὶ οἱ ἀντιπορθμοὶ τῆς Βυζαντιδος ἀνδρώνες, οἱ διαιτητήριον ἔκπλαται τοῖς τὰ σώματα λελωθημένοις ἐκ τῆς νόσου τῆς ἱεράς καὶ τοῖς λελεπρωμένοις τετάχεται. ἀλλὰ καὶ τούτους ὁ βασιλεὺς ἀνεκαίνισε καὶ τοῦ τὸ ὕδωρ εἰς μεγαλόπολιν εἰσαγόντος ὄλκου διαρρηχθέντος ἐπεμελήσατο.

There may well be a reference to this earthquake in an inscription (quoted in Janin 1964, p.268), which is now lost but was on a tower in the walls of Theodosius II by the Sea of Marmara. But a careful reexamination and reinterpretation of the text shows that it goes back even further. The text reads:

"The great despot of all the Romans, Romanus greater than the greatest, raised this new tower from its foundations".

Πᾶσι Ῥωμαίοις μέγας δεσπότης [ἀν]ήγειρε Ῥωμανὸς νέον ὁ παμμέγιστος [τόν]δε πύργον ἐκ βάθρων.

Foss (1984, pp.80-1) has in fact shown that the inscription refers to Romanus II (959-963), who reconquered Crete in 961, thereby acquiring the title of "greater than the greatest" (παμμέγιστος).

The earthquake may have damaged the eastern arcade of St.Sophia, which was restored by the emperor Romanus III, as we learn from an inscription (Mango 1962, pp.69-70).

Zonaras records that the earthquake damaged "the hospices and refuges" of Galata: this is a reference to the famous leper hospital of St.Zoticus (Janin 1969, pp.556-7).

The aqueduct of Valens had already been restored a few years earlier by Basil II in 1019 (Janin 1964, p.199; Müller-Wiener 1977, p.274).

Perrey (1850, p.15), Mallet (1853, p.18), Dück (1904, p.132) and Ergin *et al.* (1967, p.16 no.124) date this earthquake to 1031.

▲ 1032 08 13 17:45 UT

localities	lat.	long.	I
Istanbul	41 02	28 57	VI-VII

< 011 > **1033 March 6 Constantinople? [north-western Turkey]**

source 1 Scyl., *Synopsis*, p.386

source 2 Cedren., *Synopsis*, II, p.500

historiography Ducellier (1980)

catalogues d. Bonito (1691); Perrey (1850); Mallet (1853); Grumel (1958)

catalogues p. Ergin *et al.* (1967)

On 6 March 1033 at about 7:15 UT (the third hour of the day) an earthquake shock was felt in Constantinople, but its effects are not specified.

Information about the earthquake is to be found in Scylitzes, a Byzantine historian who lived in the second half of the 11th century.

He simply records in general terms:

"On 6 March [1033], at the third hour of the day, there was an earthquake".

Μαρτίου δὲ ἕκτη, ἡμέρᾳ τρίτῃ, γέγονε σεισμός.

The same item of information is repeated by Cedrenus (late 11th – early 12th century). According to Grumel (1958, p.480), this is a reference to an earthquake which probably occurred at Constantinople. Perrey (1850, p.15), Mallet (1853, p.18) and Ergin *et al.* (1967, p.16, no.125) date the earthquake to 1032.

Scylitzes's brief comment does not allow us to be absolutely sure that Constantinople was affected.

▲ 1033 03 06 7:15 UT

localities	lat.	long.	I
Istanbul	41 02	28 57	F

< 012 > **1033 December 5 Israeli-Palestinian area > tsunami, subsidence <**

sources 1 Salomon ben Zemar, Letter probably to Ephraim ben Shmaria, in Mann (1920), republished in Gil (1983, II, no.209, pp.382-4); al-Antaki, *Dhayl*, p.272; Scyl., *Synopsis*, p.389; Bar Hebr., *Chron.*, p.216; Ibn al-Athir, *al-Kamil*, IX, p.438; Ibn al-Jawzi, *al-Muntazam*, VIII, pp.77; Ibn Shakir al-Kutubi, *Uyun*, XIII, p.113; al-Ulaimi, *al-Uns*, p.270; Sawirus, *Hist.*, II/2, p.157

sources 2 Cedren., *Synopsis*, II, p.503; al-Suyuti, *Kashf*, p.32

literature Taher (1979)

catalogues d. Bonito (1691); von Hoff (1840); Perrey (1850); Mallet (1853); Sieberg (1932a); Grumel (1958); *Ben-Menahem (1979; 1991); *Ambrascys *et al.* (1994); Amiran *et al.* (1994)

catalogues p. Ergin *et al.* (1967); Poirier and Taher (1980); Bektur and Alpay (1988); al-Hakcem (1988)

catalogues Ts Soloviev *et al.* (2000)

Before sunset on 5 December 1033, there was a destructive earthquake in Palestine, causing widespread collapses at various places along the coast and inland as far as Jerusalem. The localities which suffered most damage were Ramla, Nablus (Nabulus), Jericho, Balas and Acre (now Akko). Many houses collapsed at Ramla (between one third and half of its buildings, depending on the source), as well as part of the town

walls; and there were many victims. The mosque suffered cracks (though some sources report that it collapsed). The surviving population, including the governor, abandoned Ramla until the shocks ceased 8 days later, camping out in the countryside. As far as Nablus, Jericho and Balas are concerned, we are told that half or all houses collapsed, and that there were many victims (300 at Nablus, according to a 12th century Arab source). Equally serious damage was caused in some villages near Nablus which the sources do not further identify. At Hebron, part of the Mosque of Abraham collapsed. In the coastal area, there was extensive destruction at Acre, where many houses collapsed (half the built-up area, according to some sources). According to al-Suyuti (15th century), the earthquake caused the village of Badan to subside, thereby killing all the villagers and their cattle.

There was serious and widespread damage at Jerusalem: part of the city walls and some churches and convents in the area were damaged, as well as the prayer niche (*mihrab*) of David. A *mihrab* is a niche indicating the direction for prayer, and is in the wall facing those gathered for prayer: a kind of tiny apse. As for the Mosque of the Rock (or Mosque of Omar), the contemporary historian al-Antaki records that it partially collapsed, whereas the 12th century Arab historian Ibn al-Jawzi specifically denies that it was damaged. Tiberias and its villages were also struck (but we do not know exactly how they were affected). There was minor damage at a few other places in Palestine: a minaret completely collapsed at Ascalon (present-day Ashqelon), and it is recorded that the upper part of a minaret collapsed at Gaza.

The earthquake was felt from Egypt to the Negev desert, and from the mountains of Galilee to Syria in the north.

The earthquake also had substantial environmental effects: the sources record a tsunami on the coast of Palestine, causing the water in the port of Acre to recede for about an hour. Evidence of tsunami effects is confined to Acre, because it was a city able to produce written evidence, but it is reasonable to suppose that the tsunami affected the whole coast.

There were fresh shocks during the night of 5 December, on the following day and during subsequent nights.

The most reliable dating for the earthquake is provided by a contemporary Hebrew source — the closest in time to the earthquake — which records it as having occurred on 5 December 1033 (12 *Tevet*). The dates given by other sources clash: the Persian traveller Nasir-i Khusrau (Mann 1920, I), who visited Ramla 13 years after the earthquake, claims that it occurred on 10 December 1033 (15 *Muharram*), whereas an Arabic source gives the date as 4 January 1034 (10 *Safar*).

This seismic event is recorded in various Hebrew, Arab and Byzantine sources of the same period or later. The most important source is a letter in Hebrew written by an eye-witness who was at Ramla at the time. Those who have published the text do not agree as to the identity of the writer: Mann (1920) thought it was Salomon ben Yehuda, but when Gil (1983) republished the letter, he identified the author as Salomon ben Zemah. The letter is unsigned and incomplete at the beginning, and was probably sent to Ephraim ben Shmaria, a friend of the writer, who lived in Egypt. The letter pays particular attention to describing earthquake effects at Ramla and the flight of its inhabitants from the town. It also provides a general description of the localities and areas struck by the earthquake.

The text of the letter is as follows:

"[...] they went out from their houses into the streets because they saw the walls bending and yet intact, and the beams become separated from the walls and then revert to their former position. Strong buildings collapsed and new houses were pulled down. Many died in the ruins, for they could not escape. All went out from their dwellings, leaving everything behind. Wherever they turned they beheld God's powerful deeds. Walls crashed together and collapsed. Those that remained were

shaky and rent. Nobody resided within them, for their owners feared they might fall down on top of them even before daybreak. Even to describe a part of the happenings, the hand would weary. Also the mind is distraught from what the eye saw and the ear heard. The verse has been fulfilled, "Behold the Lord empties out the land and lays it waste, distorts its face and scatters its inhabitants". He that is prudent will understand. For all were alike, like people like priest, like servant like master, when they left their places and sought refuge to save their lives. Many resigned themselves to the (Divine) judgment, reciting several verses (from Jer. 10.10, Ps. 104. 32, Job 9.6, Amos 9.5, Hos. 4.3, Nah. 1.6). This event took place on Thursday, 12 *Tevet*, suddenly before sunset, affecting not only Ramla but the whole of Filastin, from fortified city to open village, all the fortresses of Egypt [i.e. subject to Fatimid rule] from the sea to Fort Dan [Baniyas], all the cities of the south (Negev) and from the Mount to Jerusalem (and its surroundings), to Shehem [Nablus] and its villages, Tiberias and its villages, the Galilean mountains and the whole of Palestine'. Those that travelled on the high roads relate the mighty acts of the living God. They say "We have seen the mountains shake, leap like stags, their stones broken into pieces, the hillocks swaying to and fro, and the trees bending down". In some places the waters in the cisterns reached the brim. The tongue is inadequate for the tale. Thanks to God's mercy it happened before the day was gone, when people could see and warn each other, for had it been in the night when everybody was asleep, only a few would have been saved. But His mercies are many and his kindnesses numerous. Though He passed judgment, He will not utterly destroy. He, moreover, in His goodness brought out thick clouds and heavy rain-drops fell. Two great rainbows appeared. One of them split into two and fire was visible from the south west. Thereupon the earthquake took place, the like of which there had not been since early times. On that night (the earth) shook again. All were in the streets, men, women, and children, imploring God, the Lord of the spirits, to quieten the earth and set it at rest and save both man and animal. On Friday, as well as on the following night, the shocks recurred. All were terrified and fear-stricken. Earth and its inhabitants were molten (in fear). They all wept and cried with a loud voice, O merciful One, have mercy and withdraw the intended punishment. Do not enter upon judgment. In anger remember to be merciful and pay no heed to (our) former sins. All are trembling, sitting on the ground, startled every moment, shaking and swaying to and fro. For eight days the mind has not been satisfied and the soul is not at rest'.

'What could the writer (of this letter) do (but) address the people to declare a fast, summon a solemn assembly, go out to the field, the cemetery, in fasting, weeping and lamentation, and recite "Tear your hearts, and not your garments, and return to the Lord your God, etc. Come, let us return to God, etc. And let us ask for mercy. Who knows, (perhaps) He will retract and repent, etc. Perhaps He will go back from His fierce anger, so that we perish not". (God) magnified the miracle in that for all the days which the people spent in the streets and in the open, no rain fell. Also, the governor of the city, with the men in the Caliph's employ, pitched tents for themselves outside the town, and are still there. May the Lord, the God of the universe, look down mercifully upon his world, have pity on (His) creatures, save man and animal, and have compassion on babes and sucklings and those who know not how (to distinguish) between right and wrong, so that we perish not. May He deliver you from this and the like, protect you from all harsh judgments, hide you in his tabernacle on the day of evil, and shelter you in the protection of His wings. May He exalt you and may your good acts, kindnesses, and righteous deeds stand you in good stead. May he make you dwell securely and safe from evil fear, and may you be at peace, your houses and all that belongs to you be at peace. Receive ye peace from the Lord of Peace". [trans. based on that in Mann 1920].

יצאו מן הבתים לרחובות כי ראו הבתים הכתלים מטים ועומדים והקורות יוצאות נפרדות מן הקירות ושבות חוזרות והבינינין[ו] המחוזקות בנפלות והדירות החדשות נהרסות ורבים מתו תחת המפלות כי לא היה להם מגוש הגה והנה יצאו הכל מדירותיהם על פניהם והניחו כל אשר להם [ונמלטו] בנפשותיהם ואל כל אשר היו פונים היו רואים גבורות אל הכתלים היו מנגזים זה את זה [ונפלים ואשר נשארו כולם רעועים מבוקעים אין יושב כי מיראים בעליהם פן יפלו עליהם עד היום ואם לכתוב מקצת הנחיה תלאה היד מלכתוב גם הדעת נטרפה מאשר העין ראתה והאזן שמעה ונתקיים האמור הנה יי' בוקק הארץ ובול[קה] ועויה פניה והפיץ יושביה [ישעיה כד, א] והמשכיל יבין כי הרעו ונשתחו הכל כעם ככהן כעבד כאדוניו מצאתם מארמוניהם מבקשים מגוש לנפשותיהם ורבים מצדיק הדין ואומרים יי' אים אמת הוא אם חיים ומלך עולם וג' המרגין [לאר]ץ ותסער [ירמיה י, י] וג' המרגין ארץ ממקומה וג' [איוב ט, ו] הנוגע בארץ ותמוג [עמוס ט, ה] ואומלל כל יושב בה וג' [הושע ד, ג] לפני זעמו מי יעמוד [וג'] [נחום א, ו] והיה הדבר הזה ביום חמישי בשנים עשר יום לחודש טבת טרם בוא השמש פתע פתאום ברמלה כן בכל ארץ פלשתים כן מעיר מבצר עד כופר הפרזי [שמואל א, ו, יח] כן בכל מבצרי חוף הים עד מבצר ח[י]פה ובכל ערי הנגב והקר עד ירושלים וכל עריה עד שכם וכל כפריה [ועד ט] בריה וכל בנות[י]ה הר הגליל וכל ארץ הצבי ואשר היו מתהלכים בדרכים יגידו גבורות אל חיים יאמרו ראינו ההרים רועשים כאילים רוקדים אבניהם מתפ/צצות והגבעות מתנדדות והאילנות מתכופפות עד מימי הבורות במקומות עלו עד פיותיהם תקצר הלשון לספר ולולי רחמי אלהינו אשר רחם ברוב חסדיו והיה הדבר הזה טרם פנות היום והכל רואים זה את זה ומוהרים זה לזה לא היה לילה והיו הכל ישנים על מטותיהם לא היו נמלטים כי אם שרידים אבל רזמיו רבים וחסדיו עצומים ואם [ג]זר כלה לא יעשה גם טובו אשר הגדיל כי לפני היות הרעש ה[ע]לה עבים מוהשכים והגשימו טיפים עבים ונראו שתי קשתות גדולות ונראה כי האחת נחצת ונראתה אש ממערב נגבה בשעה ההיא היה הרעש אשר לא נראה כמוהו מימים קדומים ובלילה ההוא שוב נדה והכל בהוצות אנשים ונשים וטף צועקים אל אלהי הרוחות להשקוט הארץ להרגיעה להושיע אדם ובהמה עוד כערב שבת נדה עוד בלילי שבת והכל נבהלים אחוהי רעד נמוגים ארץ וכל יושביה [תהלים עה, ד] בוכים צועקים קול גדול רחום רחם ועל הרעה הנחם ואל תבוא במשפט ברוגו רחם [חבקוק ג, ב] תזכור ואל תזכור עונות ראשונים [תהלים עט, ח] הכל חרדות לובשים על הארץ יושבים לרגעים חורדים נעים נודדים זה שמונה ימים אין נחת רוח ואין נפש שוקטת ואשר יכול הכותב לעשות כי דבר אל העם לקדש צום לקראת עצרה ולצאת אל השדה אל בית הקברות בצום וככי ומספד ולאמר קדעו לבבכם ואל בגדיכם ושובו אל יי' א[לוה]יכם וג' [יואל כ, יג] לכו ונשובה אל יי' וג' [הושע ו, א] ונבקש רחמים מי יודיע ישוב ונחם וג' [יונה ג, ט] אולי ישוב מחרון אפו ולא נאבד והנס הגדול כי כל הימים אשר היו העם מושלכים בהוצות גם ברחובות לא ירדו גשמים גם מושל העיר עם עושי מלאכת המלך תקעו להם אהלים חוץ למדינה ועד עתה ה[ם] שם [אלהי עולם יי' ישקף ברחמיו על עולמו וירחם יצורים ויושיע אדם ובהמה ויחוס עוללים ויונקים ועל אשר לא ידעו בין ימינם לשמאלם ולא נאבד ויצילכם מזאת ומכיוצא ב[זה] ויסתירכם מכל גזירות קשות ויצפין אתכם בסכה ביום רעה ויסתירכם בסתר פניך] [תהלים לא, כא] ירומכם ויעמיד לכם מעשיכם הטובים וחסדיכם וצדקותיכם ויושיבכם בטח [ושאנן] מפחד רעה [משלי א, לג] ואתם שלום ובתי[כם] שלום וכל אשר לכם שלום [שמואל א, כה, ו] ותשאו שלום מאדון השלום

There is another contemporary report in al-Antaki:

"In that same year, al-Zahir began rebuilding the walls of Jerusalem the Noble, after rebuilding those of Ramla. Those who were entrusted with this work demolished many churches outside the city and took their stone. They were preparing to destroy the church of Sahyun (Sion), as well as other churches, so that they could take away the stone for the walls, when a terrible earthquake struck the area, such as had never been seen or heard of before, late on Thursday 10 *Safar* in the year 425 [H. = 4 January 1034]. Half the houses in Ramla collapsed, as well as various parts of the walls. There were many victims. Riha (Jericho) and its inhabitants were swallowed up, and the same thing happened at Nablus and nearby villages. Part of the great mosque of Jerusalem collapsed, as well as convents and churches in its province. Houses collapsed at Acre as well. There were a great many victims. The sea water receded from the port for an hour, and then returned to its place".

وشرح الظاهر في هذه السنة في بناء سور مدينة القدس الشريف بعد بناء سور الرملة وخرّب المتولون لعمله كنائس كثيرة في ظاهر المدينة واخذت حجارها وعولوا على نقض كنيسة صهيون وكنائس غيرها أيضا ليحملوا حجارتها إلى السور فحدث في البلد زلزلة مهولة لم تشاهد ولا سمع بمثلا آخر نهار الخميس لعشر خلون من صفر سنة خمس وعشرين وأربعمائة وسقط منها نصف ابنية مدينة الرملة وعدة مواضع من سورها وهلك من الناس فيها ما يعظم مقداراه وانقلبت مدينة ريبا على اهلها وكذلك نابلس وقرى قريبة منها وسقطت قطعة من جامع بيت المقدس وديارة وكنائس في عملها وسقط أيضا ابنية في مدينة عكا ومات فيها جماعة وغاب ماء البحر من ميناها ساعة ثم رجع الى حاله.

Ibn al-Jawzi, a 12th century Arab historian and jurist, provides detailed information

about seismic effects:

"There was an earthquake at Ramla. The inhabitants abandoned the town with their children, wives and slaves, and spent eight days outside [the walls]. The earthquake destroyed a third of the town, reduced the congregational mosque to ruins, and killed a large proportion of the populace. The earthquake then reached Nablus, where it destroyed half the houses, killing three hundred people. A nearby village was swallowed up by the earth with its people and animals; and other villages suffered the same fate. Part of the city walls of Jerusalem collapsed; a large piece fell off the prayer niche (*mihrab*) of David (peace be upon him); and the Mosque of Abraham (peace be upon him) [at Hebron] was partly destroyed. The Mosque of the Rock was not damaged. The minaret collapsed at the congregational mosque in Ascalon; and the same thing happened to the top of the minaret in Gaza. At this same time, plague was spreading in Baghdad".

وكانت بالرملة زلازل خرج الناس منها بأولادهم وحریمهم وعبیدهم الى ظاهر البلد فأقاموا ثمانية أيام وهدمت تلك الزلزلة ثلث البلد تقديرا وقطعت المسجد الجامع تقطيعا وأهلكت من الناس قوما وتعدت نابلس فسقط نصف بنيانها وتلف ثلاثمائة نفس من سكانها وقلبت قرية بازائها فساحت بأهلها وغنمها وخسف بقري أخر وسقط بعض حائط بيت المقدس ووقع من محراب داود عليه السلام قطعة كبيرة ومن مسجد إبراهيم عليه السلام قطعة الا أن الحجر سلمت وسقط منارة المسجد الجامع بعسقلان ورأس منارة غزة واتفق في هذا الوقت كثرة الموتان ببنداد.

A briefer report is provided by Ibn al-Athir (1160-1231), an Arab historian. He concerns himself principally with earthquake effects at Ramla:

"In that year [425 H.], there were many earthquakes in Egypt and the Syrian territories. Ramla was particularly affected; the inhabitants abandoned their homes for many days. About a third of its dwellings were destroyed, and many people perished in the ruins".

وفيها كثرت الزلازل بمصر والشام وكان اكثرها بالرملة فان أهلها فارقوا منازلهم عدة أيام وانهدم منها نحو ثلثها وهناك تحت الهدم خلق كثير.

More detailed information is provided by Bar Hebraeus, a 13th century Syrian historian: "And in the year four hundred and twenty-five of the Arabs, which is the year thirteen hundred and forty-five of the Greeks (1033-1034) ... [there follows a description of storms near Nisibis] and there was an earthquake in Egypt and in Palestine, and men went forth from their houses and remained under the heavens for eight days. And one half of the city of Balash [i. e. a town in Syria called Balis or, in Greek, Barbalissus] fell down. And the earth swallowed up many villages in Syria with their inhabitants. And portions of the walls of the Temple in Jerusalem fell down, and a minaret of the Arabs in Ascalon, and the top of a minaret in Gaza, and a half of the city of Akko. And the sea retreated three parasangs, and men went into it to collect fish and shell-fish; but the waters returned and drowned some of them". [Budge's transl.]

وحدث في سنة الف واربعمائة وخمسة وعشرين من الهجرة النبوية زلزال عظيم في مصر والشام والجزيرة العربية فهدمت بالرملة ثلث البلد وأهلكت من الناس قوما وتعدت نابلس فسقط نصف بنيانها وتلف ثلاثمائة نفس من سكانها وقلبت قرية بازائها فساحت بأهلها وغنمها وخسف بقري أخر وسقط بعض حائط بيت المقدس ووقع من محراب داود عليه السلام قطعة كبيرة ومن مسجد إبراهيم عليه السلام قطعة الا أن الحجر سلمت وسقط منارة المسجد الجامع بعسقلان ورأس منارة غزة واتفق في هذا الوقت كثرة الموتان ببنداد.

Information about this earthquake, some of it very detailed, can also be found in the work of al-Suyuti and al-Ulaimi, two 15th century Arab historians (the latter lived from 1456 to 1522 and was a native of Jerusalem).

Al-Suyuti records:

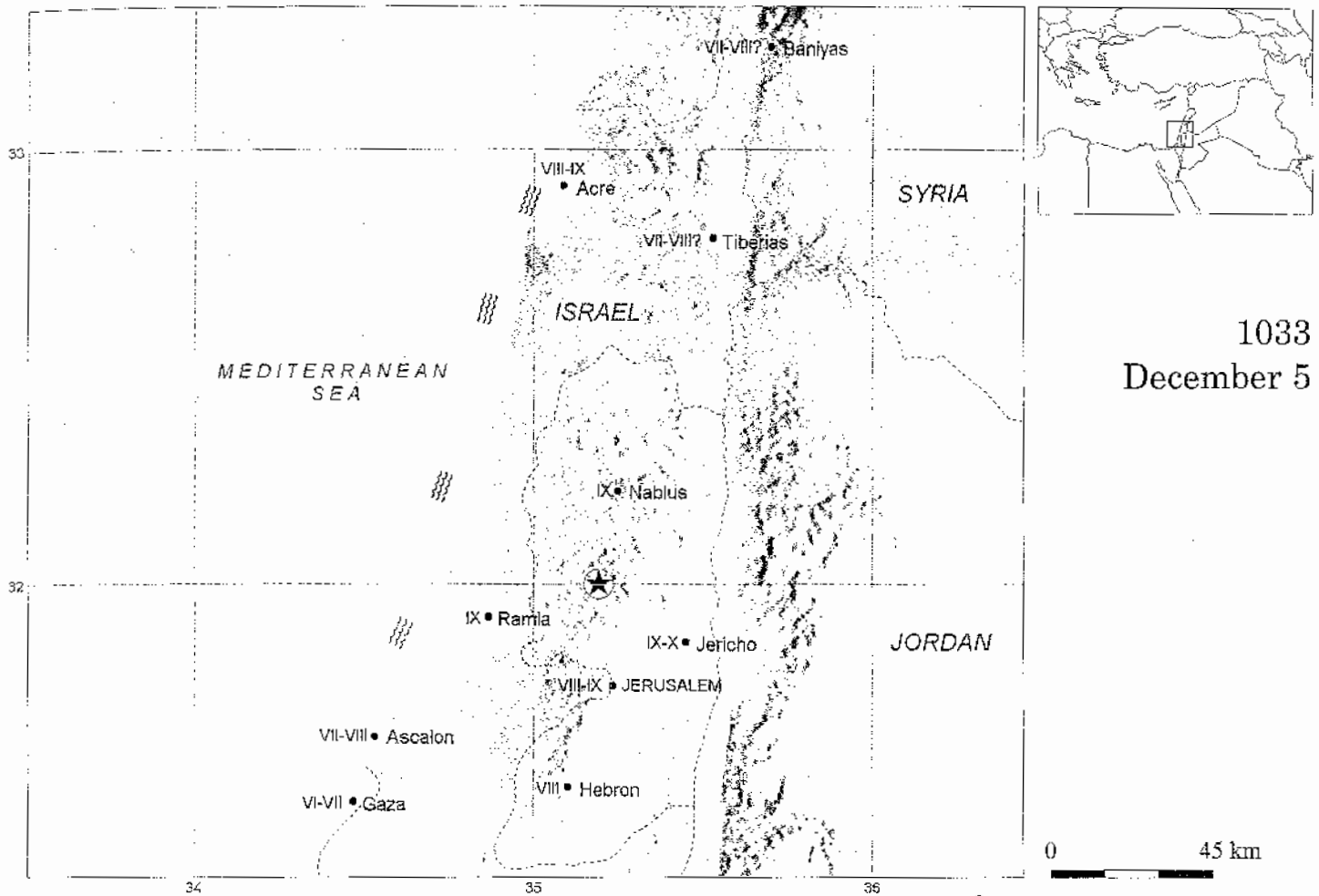


fig. 2

"In the year 425 (H. = 26 November 1033 – 15 November 1034), there were numerous earthquakes in Egypt and the Syrian territories, causing a great deal of destruction, and a large number of victims perished in the ruins. One third of Ramla was destroyed and the mosque was razed to the ground; the townspeople left the town and spent eight days outside. When everything was calm, they went back. Part of the walls of Jerusalem collapsed, part of the prayer niche (*mihrab*) of David fell down, as did part of the mosque of Abraham. The minaret at Ju'lan (Ascalon) collapsed, and part of that in Gaza. Half the buildings in Nablus were razed to the ground, and at the village of Badan, subsidence swallowed up the inhabitants with their herds of cows".

وفي سنة خمس وعشرين واربعمائة كثرت الزلازل بمصر والشام فهدمت شيئا كثيرا ومات تحت الردم خلق كثير وانهدم من الرملة ثلثها وتقطع جامعها تقطيعا وخرج اهلها فاقاموا ظاهرها ثمانية ايام ثم سكن الحال فعادوا اليها وسقط حائط بيت المقدس ووقع من محراب داود قطعة ومن مسجد ابراهيم قطعة وسقطت منارة جعلان ورأس منارة غزة وسقط نصف بنيان نابلس وخسف بقرية البادان واهلها وبقرها

Al-Suyuti's narrative largely coincides with that of his historian contemporary al-Ulaimi:

"In the year 425 (H. =1033-1034) there were numerous earthquakes in Egypt and the Syrian territories, causing the destruction of many houses, and many victims perished in the ruins. One third of Ramla was razed to the ground and its mosque was cracked. The inhabitants left the town and spent eight days outside; then all became

calm and they went back. Part of the walls of Jerusalem collapsed and much of the niche (*mihrab*) of David; the same thing happened to the Mosque of Abraham [at Hebron]”.

وفي سنة خمس وعشرين واربعمئة كثرت الزلازل بمصر والشام نهدت اشياء كثيرة ومات تحت الردم خلق كثير وانهدم من الرملة ثلثها وتقطع جامعها تقطعا وخرج اهلها منها فاقاموا بظاهرها ثمانية ايام ثم سكن الحال فعادوا اليها. وسقط بعض حيطان بيت المقدس ووقع من محراب داود قطعة كبيرة ومن مسجد ابراهيم الخليل.

The 11th century historian Scylitzes, who is also Cedrenus' source, collected together very brief items of information, and also provides a different date for the earthquake from that recorded in all the other sources:

“In this year 6542 [1 September 1033 – 31 August 1034], on 17 February, the towns of Syria suffered severe damage in an earthquake”.

Τούτω τῷ εφμβ' ἔτει, ἑπτακαθεκάτ η Φεβρουαρίου μηνός, σεισμοῦ γεγονότος κακῶς ἔπαθον αἱ ἐν Συρίᾳ πόλεις.

Finally, the 14th century Coptic historian Sawirus ibn al-Muqaffa' emphasised the environmental effects of the earthquake in his narrative:

“In these days a prodigious event occurred in Palestine: two mountains in the province of Banyas struck against each other, and their clash produced flames which burned many trees. Much of the sea receded so far that people could gather fish from the sea bed, since it was uncovered; and some people found objects of lead and iron and other objects, and the sea returned to its original position”.

وظهر في تلك الايام بارض فلسطين اعجوبة وهو ان جبلين في اعمال بانياس التقيا وخرج من بينهما نار عند التقايهما احرقت اشجار كثيرة ونشف من البحر قطعة كبيرة حتى كانوا الناس ياخذون السمك من على الارض التي انكشفت ووجدوا فيها رصاص وحديد واشيا كثيرة ثم ان البحر عاد لما كان عليه. البحر عاد لما كان عليه.

There are discrepancies in present-day catalogues as to the date of the earthquake: al-Hakeem (1988, p.21, no.119) dates it to January; Perrey (1850, p.15) and Bektur and Alpay (1988, p.40, no.78) wrongly date it to 17 February. Perrey (who made particular use of Byzantine historiographers) also confuses this earthquake with one he dates to 6 March 1032 [but it actually occurred in 1033], basing himself on von Hoff (1840, p.207).

▲ 1033 12 05 at night		★ = 32 00 35 12		I ₀ = IX		M _e = 6.0		Sites: 11		EE: 1		Ts	
localities	lat.	long.	I	localities	lat.	long.	I						
Jericho WB	31 52	35 27	IX-X	Hebron WB	31 32	35 06	VIII						
Balas	—	—	IX?	Ashqelon IL	31 39	34 32	VII-VIII						
Nabulus WB	32 13	35 15	IX	Baniyas SYR	33 14	35 42	VII-VIII?						
Ramla IL	31 56	34 52	IX	Tiberias IL	32 48	35 32	VII-VIII?						
Akko IL	32 55	35 04	VIII-IX Ts	Gaza CS	31 30	34 28	VI-VII						
Jerusalem	31 46	35 14	VIII-IX	Badan ET	30 28	33 59	EE						

< 013 > **1034 September 1 – 1035 August 31 [6543 B. s.]**
Northern Anatolia [Turkey] > subsidence <

source 1 Scyl., *Synopsis*, p.398

sources 2 Cedren., *Synopsis*, II, pp.513-4; Glyc., *Ann.*, p.588

historiography Foss (1977); Ducellier (1980)

catalogues d. Bonito (1691); Perrey (1850); Dück (1904); Grumel (1958)

catalogues p. Ergin *et al.* (1967); Shebalin *et al.* (1974)

Between 1 September 1034 and 31 August 1035 an earthquake occurred in the Bucellarian *thema* (northern Anatolia) causing five unidentified villages to be swallowed up by the earth. The Bucellarian *thema* covered an area situated in present-day northern Anatolia, including Ancyra (present-day Ankara) and, further to the north, Claudiopolis and the land as far as Heraclea Pontica on the shores of the Black Sea. The term *thema* describes a territorial unit administered by a *strategos*.

Information about this earthquake is to be found in Scylitzes, a Byzantine historian who lived in the second half of the 11th century:

"At that time [year of the world 6543 = 1 September 1034 – 31 August 1035] an earthquake caused subsidence in the Bucellarian [*thema*], and five villages were completely swallowed up".

κατὰ τοῦτον τὸν χρόνον σεισμοῦ γεγονότος χάσματα γέγονεν ἐν Βουκελλαρίοις, καὶ κοιπετόθησαν ὀλόκληρα χωρία πέντε.

The same item of information is taken up by Cedrenus (late 11th – early 12th century) and Glycas (12th century).

It is not clear on what basis Foss (1977, p.82) claims: "Ankara seems not to have been affected". Perrey (1850, p.15) and Shebalin *et al.* (1974, sheet 9) date this earthquake to 1037, confusing it with the one which occurred on 18 December 1036. Ergin *et al.* (1967, p.16, nos.126-7) list two separate earthquakes occurring at Constantinople in 1033 and 1034 respectively.

△ There are no elements with which to indicate the parameters.

< 014 > **1036 March 12 – 1037 March 11** [485 A. c.] **Cilicia?**
[central and southern Turkey] > tsunami, landslides <

source Matth. Edess., *Chron.*, 1.64
historiography Canard and Berberian (1973)
literature comets: Oppolzer (1887)

This earthquake is unknown to the seismic catalogue tradition.

The Armenian chronicler Matthew of Edessa records that in the year 485 of the Armenian era (12 March 1036 – 11 March 1037), there was a strong earthquake, preceded by a solar eclipse. It can be placed no more locally than in Cilicia, a region of central and southern Turkey facing the Gulf of Iskenderun, whose hinterland partly coincides with the ancient territory of the principality of Edessa. While there is no record of damage, the earthquake had substantial effects on the environment: mountains were severely shaken, and there were probably some landslides. Matthew also records a strong tsunami in relation to the earthquake:

"The darkness and gloom grew intense, all creatures cried out together, and all the mountains and hills resounded. The mountains and all the rocks were shaken [to their foundations] and trembled, the vast Mediterranean sea billowed back and forth, and all mankind mourned and wept. When men saw all this, they were paralysed with horror as though struck dead".

Եւ սաստկացաւ խաւարն եւ մութն, եւ կոշեաց առ հաւասարակ մեանյն արարածն, և հնչեցին ամենայն լեռինք և բլուրք, և գողաց սասանելով լեռինք և ամենայն ապառաժք, և երերալով ծփայր համատարած մեծ ծովն Ոկիիանոս, և սուգ առեալ լայր զամենայն որգիս մարդկան: Եւ եղել ՚ի տեսեալն զայս ամենայն որսիւոց մարդկան, ահաբեկեալ լինէին յերկիւղէն որպէս մեռեալ:

What Matthew has to say about the date of the earthquake is problematical, because there were no solar eclipses in the area in the year he indicates. However, two partial

1036-1037

solar eclipses were visible in Cilicia and Armenia, one before and one after 1036-1037, that is to say, on 29 June 1033 and 22 November 1044 (Oppolzer, 1887, chart 107). Later sources give alternative dates for the earthquake: while Samuel of Ani gives 484 [13 March 1035 – 12 March 1036], Aristakes of Lastivert gives a more likely date: the month of *Areg* 482 [10 August – 8 September 1033]; cf. Canard and Berberian (1973, p.38, no.1). It may well be the case, therefore, that Matthew has associated two events which in fact occurred several years apart. Although the chronicler Smbat often takes his information from Matthew, he does not record this earthquake.

△ There are no elements with which to indicate the parameters.

< 015 > **1036 December 18 Constantinople [north-western Turkey]**

source 1 Scyl., *Synopsis*, p.399

source 2 Cedren., *Synopsis*, II, p.515

historiography Ducellier (1980)

catalogues d. Bonito (1691); von Hoff (1840); Perrey (1850); Mallet (1853); Downey (1955); Grumel (1958); Ambraseys and Finkel (1991)

catalogues p. Ergin *et al.* (1967); Shebalin *et al.* (1974)

On 18 December 1036 at about 19:30 UT (the fourth hour of the night), Constantinople was struck by three earthquake shocks: two minor and one stronger. No details of effects are reported. Information about these shocks is to be found in Scylitzes, a Byzantine historian who lived in the second half of the 11th century:

“In the month of December in the fifth indiction, in the year 6545 [1 September 1036 – 31 August 1037], on the eighteenth day, at about the fourth hour of the night, there were three earthquake shocks, two small and one large”.

Δεκεμβρίῳ δὲ μηνί, ἰνδικτιῶνος πέμπτης, ἔτους ρσμε', κατὰ τὴν ὀκτώκαιδεκάτην τοῦ μηνός, παρὶ τετάρτην ὥραν τῆς νυκτός, γέγονασι σεισμοὶ τρεῖς, δύο μικροὶ καὶ εἷς μέγας.

The same item of information is taken up by Cedrenus (late 11th – early 12th century), but he wrongly dates the event to the fifteenth indiction.

The incorrect date of 1037 goes back at least to Perrey (1850, p.15) and Mallet (1853, p.19), who actually confuse this earthquake with that of 1035-36, as do Shebalin *et al.* (1974, sheet 9). Dück (1904, p.132), Downey (1955, p.600), Ergin *et al.* (1967, p.16, no.128) and Ambraseys and Finkel (1991, p.536), refer solely to the text of Cedrenus and date the earthquake to 1037.

▲ 1036 12 18 19:30 UT

localities	lat.	long.	I
Istanbul	41 02	28 57	V

< 016 > **1037 November 2 – 1038 January Constantinople? [north-western Turkey]**

source 1 Scyl., *Synopsis*, p.402

source 2 Cedren., *Synopsis*, II, p.518

catalogues d. Bonito (1691); von Hoff (1840); Perrey (1850); Mallet (1853); Dück (1904); Downey (1955); Grumel (1958); *Papazachos and Papazachou (1997)

catalogues p. Ergin *et al.* (1967)

On 2 November 1037 at about 13:00 UT (the tenth hour of the day), an earthquake was

felt — presumably at Constantinople — but its effects are not specified. The shocks lasted for three months. Information about these earthquakes is to be found in Scylitzes, a Byzantine historian who lived in the second half of the 11th century: “In the year 6546, in the sixth indiction [1 September 1037 – 31 August 1038], on 2 November, there was an earthquake at about the tenth hour of the day, and the earth continued to shake until the end of the month of January”.

Τῷ δὲ κ' φμς' ἔτει, ἰνδικτιῶνος ἕκτης, Νοεμβρίου δευτέρᾳ, γέγονε σεισμός περὶ ὥραν δεκάτην τῆς ἡμέρας, καὶ διετέλεσεν ἡ γῆ σειομένη ἄχρι ὅλου τοῦ Ἰάνουαριου μηνός.

The same item of information is taken up by Cedrenus (late 11th – early 12th century). Von Hoff (1840, p.208) dates the earthquake to 6 November 1038, and confidently situates it at Constantinople; Perrey (1850, p.15) and Mallet (1853, p.19) date it to 1038. Grumel (1958, p.480) thought it struck Thrace, Macedonia and Thessaly; but in fact it was famine which affected these regions, as mentioned immediately afterwards by Scylitzes (p.402.3-4). In Dück (1904, p.132), Downey (1955, p.600) and Papazachos and Papazachou (1997, p.190) the earthquake is dated to 2 November 1038; in Ergin *et al.* (1967, p.16, no.129) it is dated to 1038/39.

▲ 1037 11 02 13:00 UT
localities **lat.** **long.** **I**
 Istanbul 41 02 28 57 F

< 017 > **1038 September 1 – 1039 August 31** [6547 B. s.]
Constantinople? [north-western Turkey]

source 1 Scyl., *Synopsis*, p.405
 source 2 Cedren., *Synopsis*, II; pp.521-2
 historiography Ducellier (1980)
 catalogues d. Perrey (1850); Mallet (1853); Downey (1955); Grumel (1958)
 catalogues p. Ergin *et al.* (1967)

Between 1 September 1038 and 31 August 1039 there were frequent shocks — presumably at Constantinople. Information about these shocks can be found in Scylitzes, a Byzantine historian who lived in the second half of the 11th century: “And at this time [6547 year of the world – Byzantine style] there were also frequent shocks and severe flooding”.

κατὰ τοῦτον τὸν χρόνον καὶ σεισμοὶ γέγονασι συνεχεῖς καὶ ὄμβρων ἐπικλυσὶς σφοδρά.
 This piece of information is repeated word for word by Cedrenus. Mallet (1853, p.19), relying on Baronius, said that the earthquake was “not mentioned by the Byzantine writers”.

▲ 1038 09 01 – 1039 08 31 [6547 B. s.]
localities **lat.** **long.** **I**
 Istanbul 41 02 28 57 F

< 018 > **1040 February 2** **Smyrna** [western Turkey]

source 1 Scyl., *Synopsis*, pp.405, 408
 sources 2 Cedren., *Synopsis*, II, pp.522, 525-6; Glyc., *Ann.*, p.589
 historiography Ducellier (1980)
 catalogues d. Bonito (1691); Seyfart (1756); von Hoff (1840); Perrey (1850); Mallet (1853); Downey (1955);

Galanopoulos (1955); Grumel (1958); *Papazachos and Papazachou (1997)
 catalogues p. Ergin *et al.* (1967); Papadopoulos and Chalkis (1984)

On 2 February 1040 a strong earthquake struck Smyrna, causing the collapse of the principal buildings and killing a number of people. Other unspecified cities also suffered damage. The earthquake was probably felt at Constantinople.

Information about this earthquake is to be found in Scylitzes, a Byzantine historian who lived in the second half of the 11th century:

“On 2 February, in the eighth indiction, in the year 6548 [1 September 1039 – 31 August 1040], there was a terrifying earthquake, and other places and cities were also damaged. There was a pitiful spectacle at Smyrna, where the most beautiful buildings collapsed and many citizens perished”.

Φεβρουαρίου δὲ μηνὸς δευτέρου, ἰνδικτικῶνος ὀγδότης, ἔτους αὐτῆς, γέγονε σεισμὸς φρικώδης, καὶ ἔπαθον μὲν καὶ ἄλλοι τόποι καὶ πόλεις, ἐγένετο δὲ ἡ Σμύρνα ἐλεεινὸν θέαμα, καταπερσόντων τῶν καλλίστων οἰκοδομημάτων αὐτῆς καὶ πολλοὺς τῶν οἰκητόρων ἀναλωσάντων.

The same item of information is taken up by Cedrenus (late 11th – early 12th century). One can deduce from the context that the earthquake was also felt at Constantinople. In a later passage in his work, where he is concerned with predictions, Scylitzes refers once again to earthquake shocks:

“God often caused the earth to shake, and inhabited lands were a prey to terrible and frightening things; comets appeared in the sky, and there were winds and driving rain in the air, while on the land there were loud noises and shocks. I suppose that this was a prediction of the future deposition of tyrants, which had not yet occurred”.

ἔσαιε δὲ καὶ συνεχῶς ὁ θεὸς, καὶ δαίματα καὶ φόβητρα κατεῖχον τὴν οἰκουμένην, ἐν οὐρανῷ κομητῶν ἐπιτολαί, ἐν ἀέρι ἄνεμοι καὶ ὄμβροι ῥαγδαῖοι, ἐν γῆ δὲ βρασμοὶ καὶ κλόνοι. ταῦτα δὲ προεμήνυον, οἶμαι, τὴν μέλλουσαν ὅσον οὐδέπω γενέσθαι καταστροφὴν τῶν τυράννων.

Scylitzes (followed by Cedrenus and Glycas) was referring here to the family of the emperors of Paphlagonia and the death of Michael V Calaphates, who was deposed and blinded on 20 April 1042. His reign (December 1041 – April 1042) was subsequently considered to have been blighted by earthquakes.

Ducellier (1980, p.107) gives the date as 2 January 1040; Downey (1955, p.600) gives February 1041; Galanopoulos (1955, p.107), Papadopoulos and Chalkis (1984, p.311 table I) and Papazachos and Papazachou (1997, p.190) date the event to 2 February 1039; Ergin *et al.* (1967, p.16, no.130) give the year as 1040, without indicating day or month.

▲ 1040 02 02

localities	lat.	long.	I	localities	lat.	long.	I
Smyrna	38 25	27 09	IX	Istanbul	41 02	28 57	F?

< 019 > 1041 June 10 Constantinople? [north-western Turkey]

source 1 Scyl., *Synopsis*, p.414

source 2 Cedren., *Synopsis*, II, p.532

historiography Ducellier (1980)

catalogues d. Bonito (1691); von Hoff (1840); Perrey (1850); Mallet (1853); Dück (1904); Downey (1955); Grumel (1958)

catalogues p. Ergin *et al.* (1967)

On 10 June 1041 at about 17:45 UT (the twelfth hour of the day) there was an earthquake, presumably at Constantinople, whose effects are not specified.

Information about this earthquake is to be found in Scylitzes, a Byzantine historian who lived in the second half of the 11th century:

"In that year [6549 year of the world], in the ninth indiction [1 September 1040 – 31 August 1041], on 10 June, at about the twelfth hour of the day, there was an earthquake".

Τούτω τῷ ἔτει, ἰνδικτιῶνος ἐννάτης, Ἰουνίου δεκάτη, περὶ ὥραν τῆς ἡμέρας δωδεκάτην γέγονε σεισμός.

The same item of information is taken up by Cedrenus (late 11th – early 12th century). Downey (1955, p.600) wrongly dates it to June 1042.

▲ 1041 06 10 17:45 UT

localities	lat.	long.	I
Istanbul	41 02	28 57	F

< 020 > 1041 December – 1042 April Constantinople? [north-western Turkey]

source 1 Scyl., *Synopsis*, p.417

source 2 Cedren., *Synopsis*, II, p.535

catalogues d. Bonito (1691); Perrey (1850); Mallet (1853)

Between December 1041 and April 1042, a series of shocks was felt, presumably at Constantinople. Their effects are not specified and the epicentral area is not known.

Information about these shocks is to be found in Scylitzes, a Byzantine historian who lived in the second half of the 11th century:

"Furthermore, the earth shook throughout the four months of his [Michael V's] reign".

ἐκλονεῖτο δὲ καὶ ἡ γῆ παρ' ὅλους τοὺς τέσσαρας μῆνας τῆς βασιλείας αὐτοῦ.

The same item of information is taken up by Cedrenus (late 11th – early 12th century). The historical reference is to the brief reign of Michael V Calaphates (December 1041 – April 1042), who was deposed and blinded on 20 April 1042.

Bonito (1691, p.435) dates this seismic sequence to 1043.

▲ 1041 12 – 1042 04

localities	lat.	long.	I
Istanbul	41 02	28 57	F

< 021 > 1042 August 21 – 1043 August 9 [434 H.] Palmyra [central Syria]

source al-Suyuti, *Kashf*, p.32

literature Taher (1979)

catalogues d. Sieberg (1932a); *Ben-Menahem (1979); *Ambraseys and Melville (1982)

catalogues p. Poirier and Taher (1980); Bektur and Alpay (1988); al-Hakeem (1988)

The little information we have about a destructive earthquake in northern Lebanon and central Syria between 21 August 1042 and 9 August 1043 comes from a brief mention by the 15th century Arab historian al-Suyuti, who records:

"The earth shook at Palmyra [Tadmur] and Ba'albek. Most of the inhabitants of Palmyra died in the ruins".

وزلزت تدمر وبعليك ومات تحت الهدم معظم أهل تدمر.

1041-1042

▲ 1042 08 21 – 1043 08 09 [434 H.]

localities	lat.	long.	I	localities	lat.	long.	I
Tadmur SYR	34 33	38 17	IX	Baalbek RL	34 20	36 12	V

< 022 > **1045 February 1 Melitene area? [south-eastern Turkey]**
 > landslides? <

source Mich. Syr., 15.1, *Chron.*, IV, pp.571-2

This earthquake is unknown to the seismic catalogue tradition. Michael the Syrian, a 12th century monk, mentions that there was an earthquake, which he describes as "severe and terrible", in February 1045; but he does not explicitly identify its location. Since he was a native of Melitene, which stood near present-day Malatya (south-eastern Turkey), became archimandrite at the monastery of Bar Sauma, which was situated near Melitene, it seems reasonable to suppose that the earthquake struck the Melitene area. He writes:

"In the year thirteen hundred and fifty-six [of the Greeks, 1 October 1044 – 30 September 1045] ... and in the same year, there was a severe and terrible earthquake, on Friday of the week of the Ninevites; and many places were reduced to ruins".

ܡܘܨ ܩܠܘܬܐ ܩܒܝ ܩܠܝ ܥܘܕ ܩܘܡ ܩܘܒܘܨ ܥܘܕ ܩܘܒܐ ... ܩܘܒܐ ܩܘܒܐ
 ܩܘܒܐ ܩܘܒܐ ܩܘܒܐ ܩܘܒܐ ܩܘܒܐ ܩܘܒܐ ܩܘܒܐ ܩܘܒܐ ܩܘܒܐ ܩܘܒܐ ܩܘܒܐ

The week of the Ninevites was the tenth week before Easter, and included three days of fasting.

^ There are no elements with which to indicate the parameters.

< 023 > **1045 summer Erzuka [eastern Turkey]** > fissures <

sources 1 Matth. Edess., *Chron.*, 1.67; Mich. Syr., 15.1, *Chron.*, IV, p.572;
Chron. min. Arm., 1.27.4, p.391

sources 2 Smbat, *Ann.*, p.42; an unpublished *Notula* in Zeyt'unyan (1991, pp.59-60); Ar. Tabr., *Book*, p.468

historiography Incicean (1822); Dulaurier (1858); Cuneo (1988)

literature Abich (1882); Taher (1979)

catalogues d. Kostaneanc' (1902); Grumel (1958); Step'anyan (1964); Zeyt'unyan (1991);
 Karapetian (1991); Guidoboni and Traina (1995)

catalogues p. Ergin *et al.* (1967); Poirier and Taher (1980); al-Hakeem (1988); Shebalin and Tatevossian (1997); Berberian (1997)

In the summer of 1045, there was a destructive earthquake at Erzuka (now Erzincan, in Turkey) and its district, causing the total destruction of the city and of many churches in its territory. The principal earthquake was followed by numerous strongly felt aftershocks lasting for almost a year, probably until 6 March 1046. The earthquake also caused deep fissures. The principal source for the earthquake is the reliable 12th century chronicle of Matthew of Edessa, on which the work of later authors is based. Matthew reports:

"In the year 494 of the Armenian era [10 March 1045 – 9 March 1046], the violent wrath of God fell upon all creatures. For the Lord God looked upon his creatures with anger, and a fearful and horrible earthquake took place. The whole universe trembled according to the words of the prophet who said: 'Who looks at the earth and causes it to tremble?' [*Psalms*. 114:7]. At that time the whole of creation shook in this same manner. In the district of Ekcleac' many churches were shaken and collapsed in ruins.

The town of Erznga was completely demolished. The earth was torn open, and men and women sank into deep abysses, and for many days the sounds of their screams issued forth from these places. It was summertime, and day after day during that period there was shaking of the earth [some texts read "heaven", but four readings have "earth", which seems to make more sense]. We are incapable of describing the wrath and turmoil which God brought upon all of us living creatures because of our sins".

Դարձեալ ՚ի Թուականութեանն Հայոց յամի ՆՂԴ, եղև մեծասաստ բարկութիւն Աստուծոյ ՚ի վերայ արարածոցս: Քանզի հայեցաւ տէր Աստուած բարկութեամբ յարարածս իւր, և եղև շարժ ահաւոր և սաստիկ, և դողացաւ հասարակ ամենայն տիեզերք ըստ բանի մարգարէին որ ասէ "Ո՞ հայի յերկիր, և տայ դողալ ամա": Այսպիսի նմանութեամբ շարժեցաւ ամենայն արարածք, և բազում եկեղեցիք խախտեալ փլաւ ՚ի հիմանց ՚ի յեկեղեաց գաւառին. և պատառեցաւ երկիրն և արք և կանայք ընկղմեցան ՚ի խորս անդնորց, և զաւուրս բազումս գայր ճայն աղաղակի նոցա ՚ի խորաց անդնորց. և էր յամառնային ժամանակին և աւուր աւուր շարժէր երկին յամին յայնմիկ, որ ոչ բաւեմք պատմել վասն բարկութեանն և խռովութեանն զոր էար Աստուած ՚ի վերայ արարածոցն վասն մեղաց մերոց. և յամառնային ժամանակին խաւար եւ մութն լինէր ՚ի վերայ երկրի, մինչև արեգակն և լուսինն ՚ի կերպս արեան երեւէին, և յորժամ ելանէր ՚ի կամարն՝ յիստակ էր:):

Matthew of Edessa's chapter ends with the mention of an eclipse which also occurred during the summer of 1045. The earthquake is listed by Taher (1979, p.38, 128), Poirier and Taher (1980) and al-Hakeem (1988, p.21, no.122), who dates the earthquake to 1046, however. But it cannot have occurred at the beginning of the year, for one can hardly interpret the vague expression:

Դարձեալ ՚ի Թուականութեանն Հայոց յամի ՆՂԴ

in this sense, as did Dulaurier (1858, p.79), for it literally means "passing from the year 494 of the Armenians".

Smbat (13th century, p.42) bases himself on these sources. There is also an unpublished *Notula* in Yerevan ms. 2890, fols.61r-63v., mentioned by Zeyt'unian (1991, p.59ff.), which apparently attests an earthquake in Armenia in 1049.

The account by Arakel of Tabriz (17th century, p.468.9-14), freely summarises what we already know from Matthew of Edessa, and does not report any further details, except for the observation:

"The light changed in colour to red and the earth appeared enveloped in darkness".

և փոխեցաւ գոյն լուսանորաց ի կարմրութիւն, և մառախուղն պատեալ էր գերեսս երկրի.

This cannot be a mere literary conceit, especially in view of the extremely terse nature of the context in the source. It may be therefore be assumed that Arakel was reporting an observation of a red colour in the sky, probably resulting from ionisation, as frequently occurs during powerful seismic events. An Armenian chronographic *Notula* (Yerevan ms. 3854, fol.206v.; 4231, fol.71r.; *Chron. min. Arm.*, I.27.4, p.391), reports:

"In 494 [10 March 1045 – 9 March 1046] Halbat was built and an earthquake occurred".

Նղէ շինեցաւ Հաղբատ և շարժն եկն

For the site of Halbat, see Cuneo (1988, pp.302-310). This was probably one of the oldest and most extensive monastic centres in Armenia.

Grumel (1958, p.480) gave wrong chronological information on the basis of Arakel, dating the event to the Armenian year 495, which he then calculates to correspond to 1043-1044. This earthquake is already known to seismological as well as historical and antiquarian literature. Step'anyan (1964, p.51ff.) records earthquakes at Ani and

Erzincan at roughly the same period, though basing himself on secondary sources (cf. Karapetian, 1991, no.25).

▲ 1045 summer

localities	lat.	long.	I	localities	lat.	long.	I
Erzincan TR	39 44	39 30	XI	Ekeleac'	— —	— —	VIII-IX

< 024 > 1046 July 8 – 1047 June 27 [438 H.] Diyarbakir [eastern Turkey]

sources Ibn Taghribirdi, *al-Nujum*, V, p.41; al-Suyuti, *Kashf*, p.32
 catalogues p. Poirior and Taher (1980)

Between 8 July 1046 and 27 June 1047, a strong earthquake struck central and southern Turkey, with destructive effects at Diyarbakir and Ahlat, where there were widespread complete collapses and many victims. Sources for this earthquake are the 15th century Arab historians Ibn Taghribirdi and al-Suyuti. The former records that in the year 438 (H. = 1046-1047)

“an earthquake shook Akhlat and Diyarbakir and caused the collapse of the citadels and fortresses, killing many people”.

وفيها زلزلت اخلاط وديار بكر زلازل هدمت القلاع والحصون وقتلت خلقا كثيرا.

Similar information is to be found in al-Suyuti, who records:

“In the year 438 (H. = 1046-1047), there were earthquakes at Akhlat and Diyar Bakir. They razed the fortresses and citadels to the ground and killed many people”.

وفي سنة ثمان وثلاثين واربعمئة زلزلت اخلاط وديار بكر زلازل هدمت القلاع والحصون وقتلت خلقا.

▲ 1046 07 08 -- 1047 06 27 [438 H.]

localities	lat.	long.	I	localities	lat.	long.	I
Ahlat	38 45	42 29	IX	Diyarbakir	37 55	40 14	IX

< 025 > 1046 November 9 Middle Adige Valley [northern Italy]

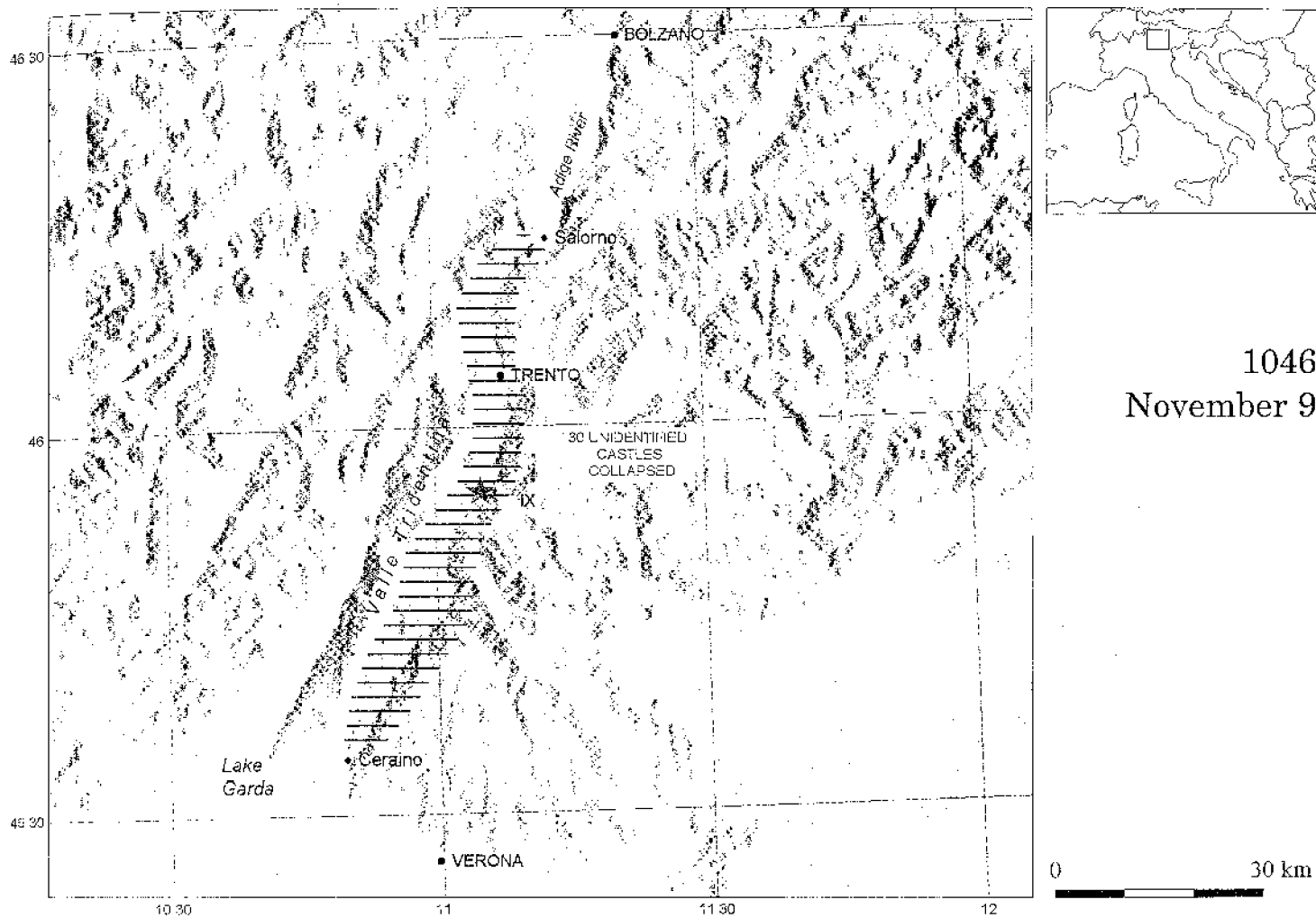
▷ rockfalls, blocking of the river Adige ◁

sources *Ann. Corb.*, p.39; *Ann. S.Emm. Ratisp.*, p.571; *Ann. Ratisp.*, p.584
 literature Leydecker and Brüning (1988)
 catalogues d. Alexandre (1990); SGA [2002]

This earthquake is unknown to the Italian seismic catalogue tradition, but is mentioned in Alexandre's catalogue (1990). Within the Italian sphere, it appears only in the SGA Report [2002].

Information about this earthquake is to be found in three 11th – 12th century Benedictine annals from Germany. Alexandre (1990) gives the earthquake effects an intensity of IX-X degrees on the MSK scale, but does not state whether this intensity is epicentral or a maximum. It was, at any rate, a seismic event of considerable destructive power, and therefore of great interest for the seismicity of the area.

On 9 November 1046, an earthquake struck the “*valle Tridentina*”: this term in 11th century indicates not so much the general Trento area (as Alexandre 1990 seems to suggest on his map on p.223) but rather a quite specific part of the Adige Valley, namely the area between Salorno (about half way between Trento and Bolzano) and the famous Ceraino defile, about 30 km north of Verona (see fig. 3).



1046
November 9

fig. 3 Here we see the area known in the Middle Ages as the *Valle tridentina*, that is to say the valley of the river Adige from Salerno to the Ceraino defile. We can be sure that there was serious damage here, involving the destruction of 30 castles not quoted in contemporary sources.

In this area more than thirty castles (fortified settlements) collapsed in ruins (*ruerint*), killing their inhabitants in some unspecified cases. The earthquake also brought about mountain rockfalls, which blocked the river "Tar" for more than ten days. Neither Leydecker and Brüning (1988) nor Alexandre (1990) identify the river Tar. Alexandre (1990) thinks it might be the *Isarcus* (Eisack), which flows through Bressanone. But in our opinion it is the river Adige (the ancient river *Althesis*). Indeed, the Latin text makes better sense if we keep German terminology in mind, for in that language *Tal* means *Valley*. Whoever wrote the report very probably had a greater command of German than of Latin, and may well simply have meant "the river in the valley". The source in question is the *Annales Corbeienses*, compiled between 822 and 1117 in the Benedictine monastery of St. Peter at Corvey (in the diocese of Paderborn in present-day Germany).

The text is as follows:

"1046. On the fifth day before the Ides of November [9 November], there was such a great earthquake in the *valle Tridentina* that more than thirty castles collapsed, some of them on top of people, and because of the earthquake, rocks came down from the mountains. Because of the rockfalls from the mountains, the river Tar was

blocked for more than ten days, and not a drop of water flowed along its bed”.

1046. *Terre motus 5 Idus Novembris in Tridentina valle nimius, adeo ut ultra 30 castella, aliqua etiam supra homines, ruerint montes terre motu subsederint. Tar insuper fluuius, montibus cadentibus interclusus, plus 10 dies nec unam guttam ad alveum dimisit.*

Two other Benedictine annals, written at Ratisbon (Regensburg in present-day Germany) simply give the earthquake a date, which agrees with that in the above source. The brief *Annales S.Emmerammi Ratisponensis*, dating to the first half of the 11th century, record:

“1046. [...] There was a great earthquake on the fifth day before the Ides of November [9 November].

1046. [...] *Terrae motus factus est magnus 5. Idus Novembris.*

Up to the year 1130, the *Annales Ratisponenses* derive in part from lost Ratisbon annals; they wrongly date the earthquake to 1045:

“1045. There was an earthquake on the fifth day before the Ides of November [9 November]”.

1045. *Terremotus quinto Idus Novembris.*

On the basis of these last two annals, Alexandre (1990) suggests, though with some uncertainty, that the earthquake was felt at Ratisbon. However, without excluding that possibility, we think it more likely that the Ratisbon annals acquired their information via the “network” linking Benedictine monasteries, without necessarily having felt the earthquake *in situ*. For the principal road link between Germany and Italy in the Middle Ages was indeed the *Valle Tridentina* (as shown on our map). There were numerous castles on hilltops along this valley, placed there to provide military control over access to the minor valleys. These castles were sometimes quite small, and had been built by officials (*ministeriales*) of the bishop of Trento.

We thus believe that passing monks may have seen the ruins, and interpreted them in terms of that religious sentiment which allowed them to see “signs of the times” in very distant phenomena, and to keep their memory alive for a long time by recording them in their annals. For this particular cultural attitude, see also the cases of the earthquakes of 1117 and 1169, and especially the chart showing how far the ‘fame’ of these events extended, for that was obviously quite different from what happened in the case of local effects.

▲	1046 11 09	Io = IX?		
	localities	lat.	long.	I
■	Middle Adige Valley	45 54	11 01	IX

< 026 > **1048 June 16 – 1049 June 4 [440 H.] Orihuela [southern Spain]**
> **cracks in the ground, disappearance of springs,**
< **changes in the chemical content of spring water** <

source al-Udhri, in Bretón González and Espinar Moreno (1996, p.60)
literature Bretón González and Espinar Moreno (1996)
catalogue p. Martínez Solares and Mezcua (2002)

In the year 440 of the Hegira (16 June 1048 – 4 June 1049) a year-long earthquake sequence struck the area between Orihuela and Murcia in southern Spain. There were repeated shocks even within a single day, causing the collapse of houses, minarets and

taller buildings. The mosque and its minaret collapsed at Orihuela; the exact effects at Murcia are unknown. There were also substantial environmental effects throughout the earthquake area, for cracks appeared in the ground, many springs disappeared and others acquired a different smell.

The source is the contemporary Arab geographer al-Udhri, who was born in the province of Almeria (southern Spain) in 1003 and died in 1085. The text is given in Spanish translation in Bretón González and Espinar Moreno (1996, p.60):

“Report of the earthquakes which occurred in the region of the towns of Murcia and Orihuela. That is to say, the earthquakes occurred in the central area of the region of Tudmir, at the town of Orihuela and the town of Murcia and (in the land) between the two. This was after the year 440 of the Hegira [16 June 1048 – 4 June 1049]. It lasted for about a year, and was felt several times a day, every day, without a single day or night being excepted. It reached the extent that houses collapsed and minarets were destroyed, as well as every tall building. The principal mosque of Orihuela collapsed, together with its minaret. Cracks opened up in the ground in every area of the region. Many springs disappeared into the earth, and others gave off unpleasant odours.”

▲ 1048 06 16 – 1049 06 04 [440 H.]

localities	lat.	long.	I	localities	lat.	long.	I
Orihuela	38 05	-00 57	VII-VIII	Murcia	37 59	-01 08	VI-VII?

< 027 > **1050 August 5 Ghundjara [northern Turkey]**
▷ landslide, light phenomena, obstruction of watercourses,
watercourses bursting their banks <

source Yaqut, *Mu'jam*, I, p.385

literature Taher (1979)

catalogues p. Poirier and Taher (1980); al-Hakeem (1988)

On 5 August 1050, there was a destructive earthquake in the Antioch hinterland, causing houses to collapse at Ghundjara (Çankiri) and provoking a landslide in the vicinity, which buried a church and a fortress. The landslide also obstructed a watercourse, causing it to burst its banks and hence have destructive effects in about seventy localities.

This seems to be a plausible interpretation of what Yaqut, the Arab source for the earthquake, has to say about it. He records that where the landslide occurred, a spring appeared, giving rise to a torrential stream which destroyed 70 localities. The night before the earthquake, an intense light phenomenon had been seen by a great many people at Antioch. The earthquake is recorded in the *Mu'jam al-buldan*, a valuable geographical work by the Arab traveller and geographer Yaqut (1179-1229). Yaqut learned of the earthquake from a message sent by Ibn Butlan to Abu 'l-Husayn Hilal ibn al-Muhsin al-Sabi in Baghdad after 440 H., to inform him of his expedition from Aleppo to Antioch:

“On the night of Monday 5 *Ab* in the above-mentioned year, many people in and outside Antioch seemed to see the heavens open, and from the opening came forth a shining and dazzling light, which was immediately extinguished. In the morning, everyone was talking about the phenomenon. News subsequently arrived that in the early hours of [that same] Monday, a terrible earthquake had struck the town of Ghunjara, in Byzantine territory, 19 days' march from Antioch. The earthquake had lasted for the whole day, causing its houses to collapse. In one place outside the town, there was a landslide: a church and a solid fortress disappeared without trace there. At the place

where the landslide occurred, a spring of boiling water gushed forth. The torrent which it produced swept away 70 villages. The populace fled from those villages, finding safety in the mountains and high places. The water remained on the ground for seven days, encircling the town over a radius equivalent to two days' march; then [the earth] absorbed it, leaving a residue of dirt".

وشاهد غير واحد في داخل انطاكية وخارجها في ليلة الاثنين الخامس من شهر آب من السنة المقدم ذكرها في السماء شبه كوة ينور فيها نور ساطع لامع ثم انطفأ وأصبح الناس يتحدثون بذلك وتوالت الأخبار بعد ذلك بأنه كان في أول نهار يوم الاثنين في مدينة غنجره وهي داخل بلاد الروم على تسعة عشر يوماً من انطاكية زلزلة مهولة تناهت في ذلك اليوم وسقط منها أبنية كثيرة وخسف موضع في ظاهرها وكانا هناك كنيسة كبيرة وحصن لطيف غابا حتى لم يبق لها أثر ونبع من ذلك الخسف ماء حار شديد الحرارة كثير المنبع التدفق وغرق منه سبعون ضيعة وتهارب خلق كثير من تلك الضياع الى روؤس الجبال والمواقع المرتفعة العالية فسلموا وبقي ذلك الماء على وجه الأرض سبعة أيام وانبسط حول هذه المدينة مسافة يومين ثم نضب وصار موضعه وحلاً.

▲ 1050 08 05

localities	lat.	long.	I	localities	lat.	long.	I
Çankiri	40 35	33 37	IX	Antioch	36 14	36 07	NF

< 028 > **1063 July 30 – August 27** [*Sha'ban* 455 H.] **Tripoli [Lebanon]**

sources Ibn al-Jawzi, *al-Muntazam*, VIII, p.231; Ibn al-Athir, *al-Kamil*, X, p.30; Ibn Kathir, *al-Bidaya*, XI, p.89

literature Taher (1979); Poirier *et al.* (1980)

catalogues d. von Hoff (1840); Perrey (1850); Mallet (1853); Sieberg (1932a); *Ben-Menahem (1979); Amiran *et al.* (1994)

catalogues p. Poirier and Taher (1980); al-Hakeem (1988)

In 1063, in the month of *Sha'ban* (30 July – 27 August), strong earthquakes struck the coastal region stretching from present-day Turkey in the north to Lebanon in the south: at Tripoli (or Tarabulus), in Lebanon, the city walls collapsed; there was also damage at Antioch (Antakya), now in Turkey, Laodicea (now Al-Ladhiqiya), on the coast of Syria, and Tyre (or Sur), in southern Lebanon. The sources also say that the damage zone extended from part of what was then Byzantine territory to "various places in the Syrian territories", but they do not name the places affected. The principal source for this earthquake is Ibn al-Jawzi, a 12th century Arab jurist and historian, who wrote:

"In the month of *Sha'ban*, there were earthquakes at Antioch, Laodicea, in part of Byzantine territory, at Tripoli, at Sur, and at various places in the Syrian territories. The walls of Tripoli collapsed".

وفي شهر شعبان كانت زلزلة عظيمة بأنطاكية واللاذقية وقطعة من بلاد الروم وطرابلس وصور وأماكن من الشام ووقع سور طرابلس.

Brief reports can be found in Arab historians of later centuries. Ibn al-Athir, an Arab historian who lived in the late 12th and early 13th century, simply writes: "there was a tremendous earthquake in the Syrian territories".

كانت بالشام زلزلة عظيمة.

Finally, Ibn Kathir, a 14th century Arab historian, records: "an earthquake struck [...] the Syrian province".

كانت بواسط وأرض الشام زلزلة.

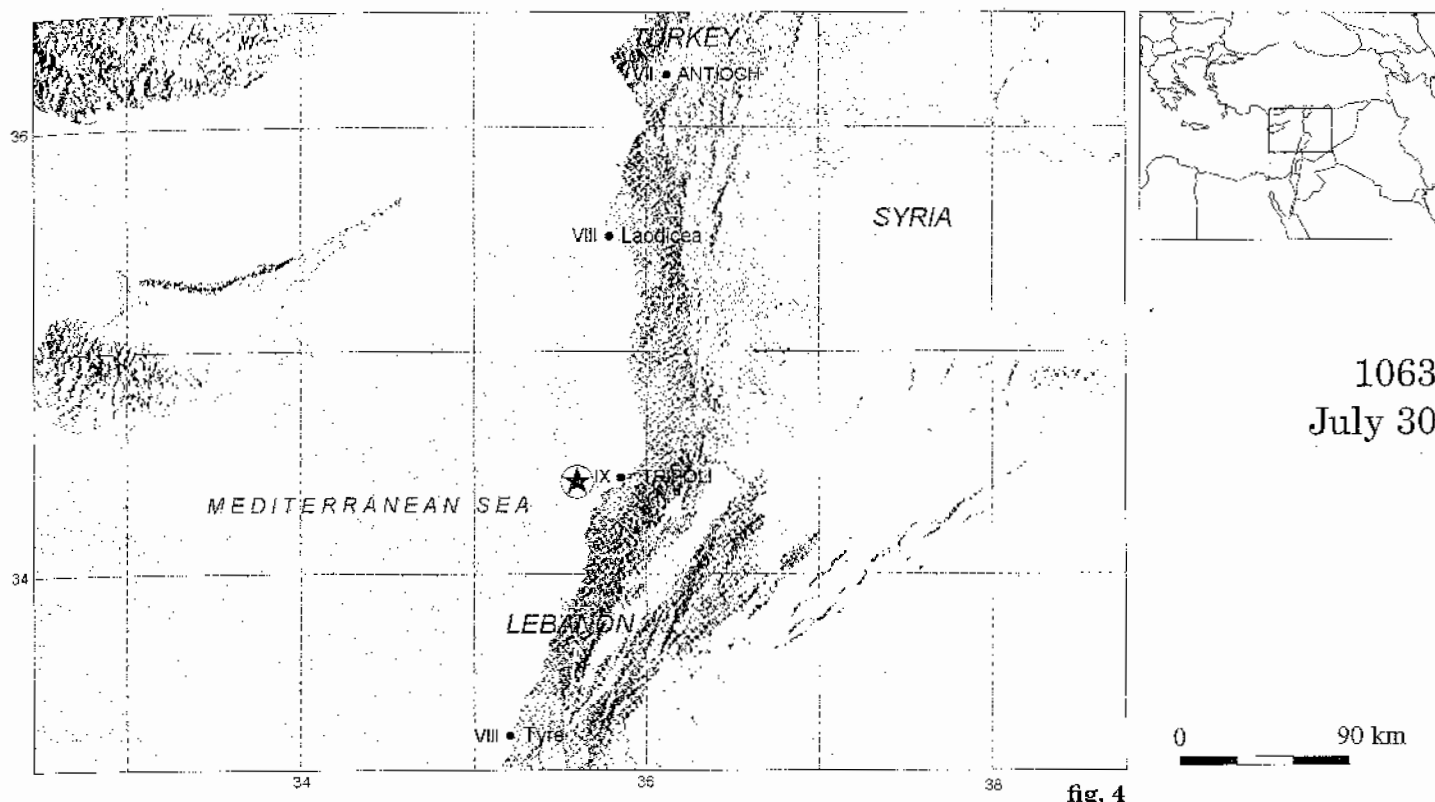


fig. 4

▲ 1063 07 30 - 08 27 ⊛ = 34 24 35 36 I₀ = VIII Me = 5.6 Sites: 4

localities	lat.	long.	I	localities	lat.	long.	I
Tripoli RL	34 26	35 51	IX	Tyre RL	33 16	35 11	VIII
Al-Ladhiqiya SYR	35 31	35 47	VIII	Antioch TR	36 14	36 07	VII

< 029 > **1063 September 23 Sea of Marmara [Turkey]**

sources 1 Attal., *Hist.*, pp.87-8, 89-90; *Chron. min. Byz.*, 3.7, in Schreiner (1975, p.51), previously in Lampros (1910, p.131, no.11); Psell., *Discourse*, in Spadaro (1977-78, pp.92-8) and in Gautier (1978, pp.145-51); Psell., *Epist.* no.79, in Sathas (1876, pp.312-3)

sources 2 Zon., *Epit.*, 18.9.11-12, III, pp.679-80; *Scyl. Cont.*, II, pp.657-8; Glyc., *Ann.*, pp.605-6; Ephr., *Chronogr.*, 3334-8; Maurop., pp.165-8; Planudes, *Epist.* 55

historiography Wendel (1940); Schreiner (1977); Spadaro (1977-78); Gautier (1978); Ducollier (1980); Dagron (1981); Saradi-Mendelovici (1990)

catalogues d. Bonito (1691); Seyfart (1756); von Hoff (1840); Perrey (1850); Mallet (1853); Dück (1904); Downey (1955); Galanopoulos (1955); Grumel (1958); Ambraseys and Finkel (1991); *Papazachos and Papazachou (1997); Guidoboni *et al.* [2004]

catalogues p. Ergin *et al.* (1967); Shebalin *et al.* (1974)

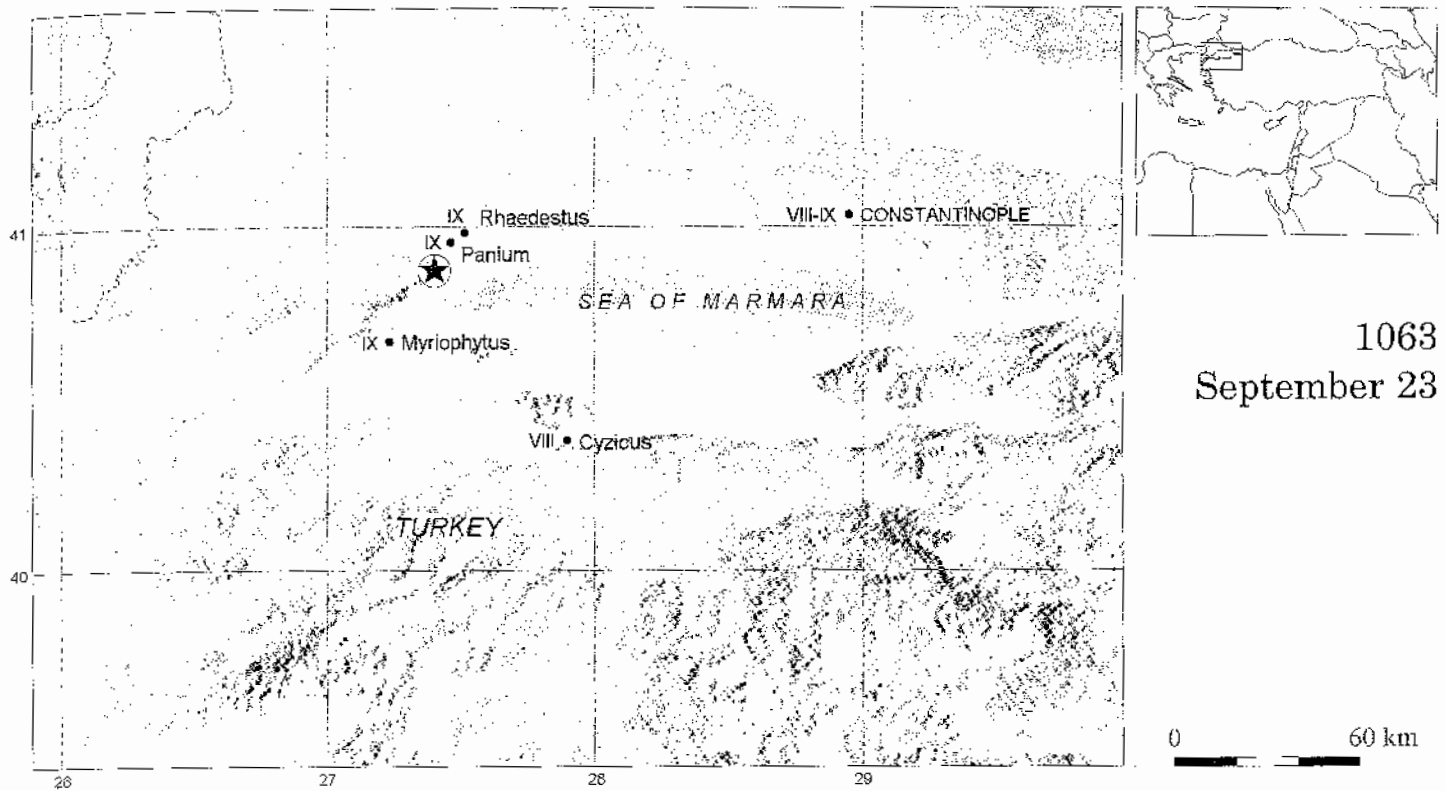
On 23 September 1063 at night, a strong earthquake struck the towns on the coast of the Sea of Marmara. Rhaedestus (Tekirdag) and Panium (Barbaros) in southern Thrace were affected, and especially Myriophytus (Mürefte), where many houses collapsed, and a great many people were killed. At Cyzicus (near Erdek), on the southern shore of the Sea of Marmara, part of the Greek temple collapsed — probably the temple built by the emperor Hadrian (117-138). Many houses in Constantinople collapsed, few remaining undamaged. Some churches collapsed partly or entirely, and some columns split open.

The earthquake effects were aggravated by the fact that the first shock was immediately followed by a further series of three. During that same night, there were another 10 or 12 shocks, but their effects were much less than in the case of the first.

Information about this earthquake is to be found in Attaliates, an 11th century Byzantine historian, who lived at the time of the event:

"Before that year [1064-65], in the month of September, that is to say in the second indiction [1 September 1063 – 31 August 1064], during the 23rd day of that month, towards the second watch of the night, a very strong earthquake occurred, more dreadful than any previous one, and it began in western regions. It was so powerful that it knocked down many houses, leaving only a few undamaged. Not even churches remained untouched by the violence of the earthquake, for they too collapsed in part or even entirely. And columns were split open as though by blows with an axe. It did not cease after the first shock, as is usually the case, for there were three powerful shocks in succession. This caused great wailing and fear such as had never been felt by human beings before, and as they came out of their houses they raised their cries to God with the usual invocations. Women who lived in their own rooms were so struck with terror that they abandoned all sense of shame and came out into open spaces with loud cries. Then, that same night, the earth shook ten or twelve more times, but the effects were much less than in the case of the earthquake which had preceded them. And if they had been as great as that which occurred in the morning, nothing would have prevented them from reducing to ruins every property encountered in their path, and all the inhabitants would have met a very painful death [at this point there is a brief diversion about naturalists' opinions as to the causes of earthquakes]. In the regions of Macedonia, seaside towns suffered more than others that night. I am referring to Rhaedestus, Panium and Myriophytus itself, where, in some quarters which felt the earthquake, many houses were razed to the ground and many people were killed. In the Hellespont, Cyzicus was struck: its Greek temple was shaken, and much of it collapsed. Its beautiful and enormous marbles were a marvel to behold, not only for their solidity, but for the harmony of their shapes, their construction, and their height and breadth".

πρὸ δὲ τούτου τοῦ ἔτους, κατὰ τὸν Σεπτέμβριον μῆνα δηλαδὴ τῆς δευτέρας ἐπιμεμήσεως, εἰκοστὴν καὶ τρίτην ἄγοντος τοῦ αὐτοῦ μηνός, περὶ δευτέραν νυκτὸς φυλακὴν γέγονεν ἄθρόον σεισμός τῶν πώποτε γενομένων ἐκπληκτικώτερος, ἐκ τῶν ἑσπερίων μερῶν ἀρξάμενος. τοσοῦτος δὲ ἦν τὸ μέγεθος ὡς καὶ οἰκίας ἀνατρέψαι πολλὰς, ὀλίγας δὲ ἀνυβρίστους καταλιπεῖν. οὐδὲ ναοὶ τῆς τούτου σφοδρότητος ἀθιγαῖς μεμενήκασιν ἀλλὰ καὶ αὐτοὶ κατὰ τινα μέρη, ἔστι δ' οἷς καὶ τὰ πλεῖστα περιεράγησαν καὶ κίονες ὥσπερ τισὶ λαξευτηρίοις περιεδρύφθησαν. οὐ γὰρ ἀπαξ προσβαλὼν, ὡς τὰ πολλὰ εἰώθει, ἐλώφησεν, ἀλλὰ μετὰ σφοδρότητος κινήσεις τρεῖς προσεχῶς ἐτελέσθησαν, ἀφ' ὧν κωκυτὸς μέγιστος καὶ φόβος ὅσος οὐδέπω τοῖς ἀνθρώποις ἐπέπεσε, καὶ τῶν οἰκιῶν ἐξίοντες τὸ σύνθηες ἐπιφώνημα πρὸς θεὸν ἀνεβόων, καὶ γυναῖκες θαλαμειόμεναι, τῷ φόβῳ κατασεισθῆναι, τὴν αἰδῶ περιῖλον καὶ τοῖς ὑπαίθροις ἐφίσταντο, τὴν αὐτὴν ἐπαφιεῖσαι φωνήν. εἶτα τῆς νυκτὸς ἐκείνης ἄχρι τῶν δέκα καὶ δώδεκα τρόμοι τῆς γῆς ἠκολούθησαν, τῶν προηγησαμένων πολλῶ τῷ περίοντι ἐλάττωτες· ἢ γὰρ ἂν, εἰ τοῖς πρώην ἐξίσωνται, οὐδὲν ἦν τὸ κωλύσον μὴ οὐχὶ πᾶσαν ὁμοῦ τὴν κτῆσιν δι' ἧς ἐπεπόλασε καὶ ἦν ἐπῆλθεν, ἐκ βάρων αὐτῶν ἀνατραπῆναι καὶ εἰς οὐδὲν χρησιμεῦσαι, καὶ παγγενεῖ τοὺς οἰκῆτορας πάντας οἰκτίστου θανάτου γεύσασθαι [...]. Ἐν δὲ τοῖς Μακεδονικοῖς μέρεσιν αἱ παράλιοι πόλεις κατ' ἐκείνην τὴν νύκτα μᾶλλον τῶν ἄλλων πεπόνθησαν, Ραιδεστός τε θῆμι καὶ Πάνιον καὶ αὐτὸ Μυριόφυτον, ὡς καὶ μέρη τυχὸν ἐξ αὐτῆς ὑποβάθρας ἀνατραπῆναι καὶ πλεῖστας οἰκίας, καὶ φόνον ἐπιγενέσθαι πολλοῖς. ἐν δὲ τῷ Ἑλλησπόντῳ ἡ Κύζικος, ὅποτε καὶ τὸ ἐν αὐτῇ Ἑλληνικὸν ἱερὸν κατεσεισθη καὶ τῷ πλεῖστῳ μέρει κατέπεσε, μέγιστον ὄν χρῆμα πρὸς θεῶν δι' ὀχυρότητα καὶ λίθου τοῦ καλλίστου τε



1063
September 23

fig. 5

καὶ μεγίστου τεχνικωτάτην ἁρμονίαν τε καὶ ἀνοικοδομὴν καὶ ὕψους καὶ μεγέθους διάρκειαν.

As regards the geographical regions referred to by Attaliates, it must be pointed out that at that time the term Macedonia referred to a region immediately to the west of Thrace; the term Hellespont referred to a much greater area than the traditional strait connecting the Sea of Marmara and the Mediterranean, and included the city of Cyzicus.

Similar information to that provided by Attaliates is to be found in the *continuatio* by Scylitzes, and in Glycas.

Much briefer information is to be found in the chronicle in manuscript Athos Ivron 92 at fol.369 (Schreiner 1975, p.51):

"During the reign of Constantine [X] Ducas [1059-1067], there was a great earthquake on 23 September which caused the collapse of many houses and churches, and it was at the time when the Greek temple at Cyzicus also collapsed, and the great church at Nicea".

ἐπὶ τῆς βασιλείας Κωνσταντίνου τοῦ Δούκα ἐγένετο σεισμός μέγας κατὰ τὴν εἰκοστὴν τρίτην τοῦ Σεπτεμβρίου μηνός, ὑφ' οὗ πολλὰ οἰκίαι καὶ ναοὶ κατέπεσον, ὅτε καὶ τὸ κατὰ τὴν Κύζικον ἑλληνικὸν κατέπεσε τέμενος καὶ ὁ ἐν Νικαίᾳ μέγιστος ναός.

The collapse of the "great" church at Nicea is in fact to be related to a different earthquake, which occurred in September 1065, as we are told by Attaliates, who lived at the time. Zonaras (12th century), like the preceding source, associated the information about Nicea with the earthquake of 23 September 1063.

Michael Psellus, a contemporary historian and rhetorician, composed a brief discourse, preserved in a 13th century ms. (Paris. Gr. 1182, fols.93r-95v, published by Spadaro 1977-78), which was originally delivered in connection with the 1063 earthquake:

"On the earthquake which occurred on 23 September, [the feast] of the Precursor".

Εἰς τὸν σεισμὸν τὸν γενόμενον τῇ εἰκοστῇ τρίτῃ τοῦ Σεπτεμβρίου μηνὸς τοῦ Προδρομοῦ.

This discourse by Psellus, which was delivered to celebrate the feast of the Precursor (i.e. St. John the Baptist) on 24 September, is a rhetorical disquisition (ὕπόθεσις) on the causes of earthquakes in general, and contains references to the theories of the ancient philosophers (Dagron 1981, p.102), but it does not contain specific information about this earthquake, because it was written, as Spadaro (1977-78, p.85) points out, with the "aim not of informing, but of consoling and warning".

In an unattributed letter of 1064 (Sathas 1876), Psellus speaks highly of the metropolitan of Cyzicus (Romanus?), whose diocese had been struck by a violent earthquake the year before. He writes:

"This once famous metropolis is, so to speak, a forgotten ruin, because of troubles brought on by the years. Last year, God shook it so violently that it had to drink divine wrath to the dregs".

Ἦν μὲν γὰρ καὶ πάλαι ἡ θρυλλουμένη αὕτη μητρόπολις ἐκλειμμένη, ἰνούτως εἶπω, ὑπὸ τῆς ἀνωμαλίας τῶν χρόνων ἐρείπιον· κατασεισάντος δὲ οὕτω πέρυσι τοῦ Θεοῦ, τὸ πᾶν αὕτη τοῦ τρυγίου τῆς τοῦ Θεοῦ ὀργῆς ὑπεδέξατο.

It was because he was so impressed by this earthquake that John Mauropus wrote a homily on "the fears which beset us and the divine signs which have been seen". The ruins of Cyzicus were described by the Byzantine scholar Maximus Planudes (c.1255 – c.1305), in a letter (*Epist.* 55) written after 1294 (see Wendel 1940, pp.432-5 for the chronology). There is an echo of the destruction involved, deriving from historiographical sources, in the verse chronicle of Ephraim, a Byzantine poet who lived in the late 13th and early 14th century. To a considerable degree, the earthquake catalogue tradition wrongly dates this earthquake to 1064: Bonito (1691, pp.437-40), Seyfart (1756, p.19), von Hoff (1840, p.210), Perrey (1850, p.15), Mallet (1853, p.20); Downey (1955, p.600) all do so, whereas Shebalin *et al.* (1974, sheet 9), also give the dates 1063 or 1065 as alternatives. Ergin *et al.* (1967, p.16, no.133), give the date 1063, but also 23 September 1064 as an alternative; Dück (1904, p.133) dates it to 1065.

▲ 1063 09 23 at night ★ = 40 52 27 24 I₀ = IX Me = 6.0 Sites: 5

localities	lat.	long.	I	localities	lat.	long.	I
Müreſte	40 40	27 15	IX	Istanbul	41 02	28 57	VIII-IX
Barbaros	40 57	27 28	IX	Cyzicus	40 23	27 54	VIII
Tekirdag	40 59	27 31	IX				

< 030 > 1063 September – c. 1065 September Constantinople [north-western Turkey]

source 1 Attal., *Hist.*, p.90

source 2 Psell., *Discourse*, in Spadaro (1977-78, pp.92-8)

historiography Dagron (1981)

catalogues d. Bonito (1691); Perrey (1850); Mallet (1853); Grumel (1958)

Immediately after recording the earthquake of 23 September 1063, Attaliates (11th century, a contemporary of the event) states that in the two following years at Constantinople there were more sporadic shocks. The unusual length of this seismic sequence caused great amazement amongst the inhabitants of the city, who could not recall a similar occurrence in the past. Attaliates writes:

"For two years after that time, sporadic shocks occurred on various occasions, and men

were greatly amazed by them. Certain elderly people recalled that two of these earthquakes resembled the "great" earthquake; some said the latter had been more powerful, while others thought the former to have been greater. They said, in fact, that the earlier shocks had been by no means briefer, lasting for forty days. In the case of the one which lasted two years, however, the earth had shaken, and no-one could recall a similar event, nor could one be found in any historical narrative".

Ἀπὸ τότε δὲ καὶ μέχρις ἐνιαυτῶν δύο σποράδες ἐπεφοίτων σεισμοὶ κατὰ διαφορὰς καιρῶν. καὶ τὸ θάμβος μέγιστον ὅσον περιεγίνετο τοῖς βροτοῖς. ἦσαν γὰρ τινες ἔξωροι, οἱ παρεοικίτας σεισμοῦς τῷ μεγίστῳ δύο ἀνέφερον, οἱ μὲν τοῦτον οἱ δ' ἐκείνους κατὰ σύγκρισιν ὑπεραίροντες. καὶ παρηκολουθηκέναι τότε δι' ἡμερῶν τεσσαράκοντα καὶ μὴ πλείω βραχεῖς τινὰς προσεπέφερον. τὸ δὲ διὰ διετούς χρόνους κλονεῖσθαι τὴν γῆν πᾶσιν ἀμνημόνευτον ἦν καὶ μηδ' ἱστορίᾳ περιληπτὸν [...].

Michael Psellus seems to be referring to a long series of shocks when, at the end of his discourse on the earthquake of 23 September 1063, he writes that the wrath of God seemed to be slowly dying away, the shocks now being less violent than before.

It is not easy to identify the forty-day seismic sequence which formed part of a "great earthquake" recalled by the elderly of Constantinople. Perhaps this is a reference to the sequence of shocks which occurred between January and 9 March 1010.

△ There are no elements with which to indicate the parameters.

< 031 > **1065 March 27 Brescia [northern Italy]**

sources 1 Arnulf Mbl., *Liber*, p.191; *Ann. August.*, p.128

sources 2 *Ann. Brix.* (cod. B), p.812; Malvezzi, *Chron.*, col.873

historiography Capriolo (1585); Sigonio (1591); Codagli (1592); Calcho (1644); Faino (1658); Calvi (1676-77); Tatti (1683); Tovazzi (ed. 1986); Odorici (1856); Giulini (1854-57); Nardini (1982)

literature *comets*: Ho Peng Yoke (1962); Maffei (1987); Yeomans (1991)

catalogues d. Perrey (1848); Mallet (1853); Mercalli (1883); Baratta (1901); Milne (1911); Alexandre (1990); *Boschi *et al.* (1995, 1997, 2000)

catalogues p. Giorgetti and Iaccarino (1971); Carrozzo *et al.* (1973); Postpischl (1985); CPTI (1999)

On Easter Day, 27 March 1065, Brescia was struck by two strong earthquakes. The city walls collapsed, and some of the inhabitants fled into the fields in terror. The earthquakes were also felt in Milan.

Arnulf was an eminent 11th century Milanese historian, responsible for a *Liber gestorum recentium* in which, after recording passing comets, he reports prolonged seismic activity culminating in two earthquakes on Easter Day 1065, one in the morning and one in the evening:

"At this time, as Spring was waning, within the space of a single month, fiery comets were seen to spread their sinister light in the sky; and there were also frequent earthquakes in the world, to the extent that on the very day of the Resurrection of Our Lord [27 March] two occurred: one in the morning and the other in the evening".

His diebus declinante iam vere mensis unius spatio dirum sparsere iubar, ardentem in celo comete, frequentes quoque terre motus mundo fuere, adeo, ut die ipso resurrectionis dominice bis feret, mane scilicet et vespere.

Since Arnulf's work deals with contemporary events affecting Milan, his evidence has been interpreted as applying to that city. The astronomical phenomena he mentions in fact relate to one of the most spectacular appearances of Halley's comet. As numer-

ous Eastern and Western sources confirm, it was visible for more than two months, from April to early June 1066 (Ho Peng Yoke 1962; Maffei 1987; Yeomans 1991). This is one of a number of cases in Arnulf's chronicle where he does not adhere strictly to chronological order, with the result that the sighting of the comet in 1066 is recorded before the earthquake of 1065.

As far as Brescia is concerned, late but reliable evidence is provided by Giacomo Malvezzi (late 14th - early 15th c.), a doctor whose *Chronicon Brixianum*, compiled from 1412 onwards, records a violent earthquake which damaged a large part of the city walls, and caused the terrified inhabitants to flee into the fields.

There may also be a reference to this earthquake in the *Annales Brixianenses* written in the abbey of S. Pietro in Brescia in the 13th century, where we read:

"1051. Great earthquake in Italy and at Brigania [probably Brescia]".

1051. terremotus magnus per Italiam et Briganium.

The information derives from earlier brief annals of Brescia, though with a few errors of transmission which may explain both the altered date — 1051 instead of 1065 — and the misreading of the city's name: *Brigania* for *Brixia*.

As regards the chronology of the earthquake, it has to be pointed out that Malvezzi dates it to 11 April 1064. Easter Day was indeed 11 April in 1064, but therefore did not coincide with "the day of the Incarnation" [the feast of the Annunciation], 25 March. The date 27 March 1065 is hence much more likely, since it is given by Arnulf and explicitly confirmed by the *Annales Augustani*, a contemporary chronicle compiled by various canons of Augsburg cathedral:

"1065. A great earthquake in Italy on the day of the Resurrection of Our Lord, the sixth day before the Calends of April [27 March]".

1065. In Italia terrae motus magnus resurrectione Domini 6 Kalendas Aprilis.

In 1065, the feast of the Annunciation and Easter were so close (25 and 27 March) that it was easy for the two to be merged in Malvezzi's record, which was accepted by the historiographical tradition. According to Alexandre (1990, p.141), the earthquake mentioned in the *Annales Corbeienses* as having destroyed much of the city of Nicea in 1065 should really be identified as the Brescia earthquake; but it must be pointed out that, contrary to what Alexandre tells us, the Byzantine sources — Attaliates in particular — provide a detailed account of an earthquake at Nicea in the year 1065.

▲ 1065 03 27 at morning

localities	lat.	long.	I	localities	lat.	long.	I
Brescia	45 33	10 13	VIII	Milan	45 28	9 11	F

< 032 > **c.1065 September Nicea [north-western Turkey]**

sources 1 Attal., *Hist.*, pp.90-1; *Chron. min. Byz.*, 3.7, in Schreiner (1975, p.51)

sources 2 Psell., in Würthle (1917); Zon., *Epit.*, 18.9.12, III, p.680; *Scyl. Cont.*, II, pp.657-8; *Glyc. Ann.*, p.606; Ephr., *Chronogr.*, 3339-40

historiography Janin (1975)

catalogues d. Bonito (1691)

Seismic catalogues associate this event with that of 23 September 1063 (see the entry concerned).

After recording the long two-year seismic sequence following the earthquake of 23 September 1063, Attaliates (11th century, a contemporary of the event) records that about September 1065 there was a fresh earthquake, stronger than those of the two

previous years but weaker than that of 23 September 1063. This one struck Nicca (Iznik). The church of St.Sophia collapsed, as did that of the Holy Fathers, as well as the walls and private houses. This shock brought to an end the seismic sequence which had begun on 23 September 1063. Attaliates writes:

"And two years later there was an earthquake more violent than the frequent shocks which followed, but weaker than the tremendous one of the morning [of 23 September 1063]. Nicca in Bithynia suffered a disaster, and the death and destruction were almost total. Thus some of the greatest and most outstanding churches collapsed in ruins because of the shocks: the one founded in the name of Divine Wisdom [St.Sophia] and consecrated to the metropolis, and that of the Holy Fathers, where the most holy and orthodox Fathers confirmed the council against Arius, and where Orthodoxy was set out in all its purity and shone more brightly than the sun. The same fate was suffered by the city walls and secular buildings. After that day, the shaking ceased".

μετὰ δὲ τὴν διετίαν, σεισμοῦ γενομένου μείζονος μὲν τῶν μετὰ ταῦτα συχνῶν, ἐλάττινος δὲ τοῦ πρώην μέγιστου, πέπονθε πῶσιν ἢ κατὰ Βιθυνίαν Νίκαια καὶ πανωλεθρίαν μικροῦ δεῖν καὶ καταστροφὴν παντελή. οἱ γὰρ ἐπισημότατοι ταύτης ναοὶ καὶ μέγιστοι, ὃ τ' ἐπ' ὀνόματι τῆς τοῦ θεοῦ λόγου σοφίας καθιδρυμένος καὶ καθιερωμένος τῇ μητροπόλει καὶ ὁ τῶν ἁγίων πατέρων, ἔνθα περ ἢ κατὰ τοῦ Ἀρείου σύνοδος τοῖς ὀσιωτάτοις καὶ ὀρθοδόξοις ἐβεβαιώθη πατράσι, καὶ τὸ ὀρθότομον ἐπαρρησιάσθη καὶ τηλαυγέστερον ἡλίου διέλαμψε, συνταραχθέντες κατηδαφίσθησαν καὶ τὰ τεῖχη τῆς ὁμοίας τύχης σὺν τοῖς πολιτικοῖς οἰκίμασι μετεσχίκασι. καὶ ἀπ' ἐκείνης τῆς ἡμέρας τὰ τοῦ τρόμου κατέληξεν.

Attaliates goes on to provide a religious interpretation of events. There is a reference to this earthquake at Nicca in the chronicle in manuscript Athos Iviron 92 at fol.369 (Schreiner 1975, p.51); though it is the earlier earthquake of 23 September 1063 which is being dealt with:

"During the reign of Constantine [X] Ducas [1059-1067], there was a great earthquake on 23 September which caused many houses and churches to collapse, and this was at the time when the Greek temple at Cyzicus also collapsed and the great church of Nicca".

ἐπὶ τῆς βασιλείας Κωνσταντίνου τοῦ Δούκα ἐγένετο σεισμός μέγας κατὰ τὴν εἰκοστὴν τρίτην τοῦ Σεπτεμβρίου μηνός, ὅθ' οὐ πολλὰ οἰκία καὶ ναοὶ κατέπεσον, ὅτε καὶ τὸ κατὰ τὴν Κύζικον ἑλληνικὸν κατέπεσε τέμενος καὶ ὁ ἐν Νικαίᾳ μέγιστος ναός.

The "great" church of Nicca was that of St.Sophia (Janin 1975, pp.119-20). Michael Psellus wrote a monody on the ruins of St.Sophia, but it does not contain any information about the earthquake (Würthle 1917). Zonaras (12th century) reduced this earthquake and that of 23 September 1063 to a single brief note.

▲ 1065 09 -

localities	lat.	long.	I
Iznik	40 27	29 43	IX

< 033 > 1068 March 18 Aila Israel
 ▷ fissures, formation of new springs <|

< 034 > 1068 May 29 Ramla
 ▷ tsunami, changes in well capacity, Euphrates overflowed <|

source 1 Ibn al-Banna, in Makdisi (1956), pp.239, 240-1, English translation pp.250-1

sources 2 Ibn al-Qalanisi, *Dhayl*, p.94; Ibn al-Jawzi, *al-Muntazam*, VIII, pp.248, 256; Ibn al-Athir,

- al-Kamil*, X, p.39; Brit. Mus., Ms. Or. 50, al-Dhahabi, *Ta'rikh al-Islam*, fol. 4v;
 BNFrance, Ms. Ar. 1506, Sibt Ibn al-Jawzi, *Mir'at al-zaman*, fols. 111v-112r;
 Ibn Taghribirdi, *al-Nujum*, V, p.80; Ibn Kathir, *al-Bidaya*, XII, p.99;
 Ibn Shaddad, *al-A'laq*, p.182; Sawirus, *Hist.*, II/2, p.182; al-Suyuti, *Kashf*, pp.34-5
- literature Taher (1979); Zilberman *et al.* (1998); Klinger *et al.* (2000)
- catalogues d. von Hoff (1840); Perrey (1850); *Ben-Menahem (1979; 1991); *Ambraseys *et al.* (1994);
 Amiran *et al.* (1994)
- catalogues p. Poirier and Taher (1980); al-Hakeem (1988)
- catalogues 1s Soloviev *et al.* (2000)

These two separate earthquakes have been taken to be a single event in the literature. Ambraseys *et al.* (1994) suggest that the effects described in the sources may have been caused by two separate events, but on their map they do not indicate the two areas of effects and the two epicentres.

In actual fact, the analysis of the sources has highlighted the occurrence of two earthquakes: one occurred on 18 March 1068 and the other on 29 March of the same year, the effects of which are not, however, altogether separable, in the sense that some locations may have felt both earthquakes.

Numerous Arabic sources between the 11th and 15th centuries report that on the morning of 18 March 1068 (11 *Jumada* I 460 H.) there was a destructive earthquake in north-west Arabia, and especially in the region of Hejaz, bordering the Red Sea. These texts record that there was also very serious destruction in Palestine, and especially at Ramla. There is a passage in a work by Ibn al-Banna, a contemporary writer who lived at Baghdad, in which he first brings together a description of earthquake effects in both Arabia and Palestine, dating them all to 18 March; but in a later passage effects in Palestine are dated to 29 May 1068 (24 *Rajab* 460 H.), on the basis of news brought by merchants in August 1068. This latter date suggests that there may have been two separate earthquakes with little more than two months between them. Later sources probably interpreted the two events as a single earthquake.

Although we are convinced that the seismic activity recorded by the sources did indeed consist of two separate events, we have nevertheless chosen to gather the descriptions of effects into a single entry, indicating the different affected areas on the map. In the case of some outlying localities — those in Egypt, for example — it is difficult to establish whether they were struck by the first or the second earthquake, and there may be other areas which overlap and so cannot be clearly distinguished.

1068 March 18 Effects of the earthquake

All the buildings in Aila, the present-day town of Elat on the Gulf of Aqaba, were destroyed in the earthquake, and all its inhabitants killed, with the exception of 12 fishermen who were at sea when the earthquake occurred. In the Arabian peninsula, there was slight damage at Medina, where two merlons fell from the Mosque of the Prophet. The earthquake also struck Wadi al-Safra' (Al-Safra'), Al-Marwa, Khaybar, Wadi al-Qura, Taima, Tabuk, Yanbu' al Bahr and Badr, but we do not know exactly what effects there were at these places — except for environmental effects at Taima and Tabuk. There was also serious damage in other unspecified places in the eastern part of the Arabian peninsula. In Egypt, there was damage at Tinnis and Alexandria, and we are also told that one corner of the congregational mosque in Cairo was damaged. In the Euphrates region, the earthquake was felt at Ruhba (Rawah), Baghdad and Kufa (Al-Kufah).

Environmental effects: at a place called Al-Qur, at Tabuk in the Arabian peninsula, three new springs appeared; at Taima the earth opened up, revealing hidden treasure, and a new spring appeared.

According to Ambraseys *et al.* (1994), the earthquake's epicentral area is to be located in the sparsely inhabited region between Aila and Taima.

Effects of the earthquake in Palestine

All the houses in Ramla collapsed, only two buildings and part of the town walls escaping. The mosque was badly damaged. According to the sources, there were 15,000 victims, including about 200 children who perished in the ruins of a school. Of the available sources for this earthquake, only one, namely the 12th-13th century Arab historian Ibn al-Athir, gives a figure of 25,000 victims at Ramla.

At Baniyas, a Syrian town on the frontiers of present-day Israel, Lebanon and Syria, there were many collapses, and about a hundred victims. The same was true of Jerusalem, according to Ibn al-Qalanisi, a reliable 12th century Arab historian from Damascus, whereas the other available contemporary and later sources simply tell us that in Jerusalem, the rock on which stood the Mosque of the Rock (or Mosque of Omar) was displaced and then returned to its previous position.

Environmental effects: the sea withdrew from the Mediterranean coast of Palestine, and then flowed back, engulfing many people. At Ramla, water overflowed from wells. The waters of the Euphrates overflowed its banks

Historical sources

The earthquake is recorded in reliable contemporary and later Arab sources and, for Egypt, in the work of the 14th century Coptic historian Sawirus ibn al-Muqaffa'. The information provided by the Arab historian Ibn al-Banna is of primary importance, and he personally experienced the earthquake at Baghdad, where there was no damage. Ibn al-Banna gathered reliable information for the whole damage zone (except Egypt): "News has arrived that there was a terrible earthquake in the city of the Prophet (Medina) — God's blessing and peace be on him! — on Tuesday, 11 *Jumada I* (18 March), which brought down two merlons from the minaret of the Mosque of the Prophet — peace be on him! The people were greatly disturbed by the earthquake on account of this. They turned to God in penitence for their evil deeds, broke instruments of pleasure, and poured away intoxicants. The governor of the city, known as 'the perfumer of adulterous women' was banished. Death itself is what they encountered. The earthquake then continued its course, overwhelming Wadi al-Safra', Al-Marwa, Khaybar, Wadi al-Qura, Taima, Tabuk and Aila. As for Aila, its inhabitants all perished except for 12 persons who had gone fishing at sea, thus escaping death. As for Taima, it used to have one source of water, God then produced another source in it, the bottom of which fills each year 2,000 dinars. And the earth was laid open disclosing a larger place yielding pure gold and golden jewels. As for Tabuk, God produced near the lotus tree of the Prophet — God's blessing be on him! — (and) his springs of water, in a place known as Al-Qur, three more springs of water, improving their condition. The earthquake then ploughed through ar-Ramla, 15,000 persons perished and nothing was left in it according to reports, except two houses. The Sacred Rock of Jerusalem moved from its usual place, then returned. At this time, the earthquake subsided, after it had passed through Surair, in the Hejaz, and most of the Syrian territories until it arrived at ar-Ramla. The sea [...] the distance of one day's march. The sea surged and caused great damage. It surged again, after people had gone into it gathering what they could find on its floor; none perished except those who were close to the shore. That is what happened. I hope that God will place the Muslims in renewed security. On this very same day, in the month of *Jumada I*, we had in fact experienced a slight earthquake; it was this very same one". (translation by G.Makdisi).

وورد الخبر بان في اليوم ، يوم الثلاثاء الحادي عشر من جمادى الاولى [حدثت] بمدينة النبي - صلى الله عليه وسلم - ورمت بشرافتين من منارة مسجده عليه السلام . وانزعج الناس بها لذلك وتابوا من قبائح الفعال، وكسروا الملاهي، وراقوا الخمر، ونفي امير المدينة المعروف بمحيط العواجر (؟)، ولحقهم امر عظيم، ثم امتدت الى وادي الصفا،

والمروة، وخيبر، ووادي القرى، وتيماء، وتبوك، وأيلة. فاما ايلة فأهلك أهلها الا اثنا عشر نفسا، كانوا خرجوا لصيد السمك على البحر، فسلموا. واما تيماء فكان بها عين واحدة، فحدث الله بها عين اخرى، فيمتلئ بقاعها كل سنة الف دينار. وانشقت الارض عن موضع كبير يستخرج منه الخلاص والذهب المصاغ. واما تبوك فحدث الله فيها، عند سدرة النبي -صلى الله عليه- العين التي له -صلوات الله عليه- في موضع يعرف بالقور ثلاث عيون اخرى، حسنت بها حالهم. ثم اقلبت الرملة، وهلك خمسة عشر الف نفس، ولم يبق بها -على ما حكى- الا داران. وزالت الصخرة المقدسة ببيت المقدس عن مكانها، وانتهت، في تلك الساعة، بعد ان اخذت في سرير الحجاره (٩) واكثر الشام، الى ان انتهت الرملة (...). البحر مسيرة يوم، وصعد البحر فاخرب الدنيا. ثم عاد وقد نزل الناس الى ارضه يلتقطون ويقتبسون، فاهلك منهم الا من كان قريبا من الساحل. هذا ما كان فارجو ان الله يجعل المسلمين في حديث السلامة. وقد كان عندنا في هذا اليوم بعينه، في جمادى الاولى، زلزلة يسيرة، وهي تلك بعينها.

Further on in the same work Ibn al-Banna also reports what he learned from some merchants:

"News reports from merchants arrived on Thursday (5 or 12 *Shawwal*, 7 or 14 August) at the residence of the Shaikh Ajall Ibn Jarada to the effect that there have occurred in Palestine and ar-Ramla, on the 24th of *Rajab* this year (29 May 1068) a terrible earthquake, which destroyed all the dwellings except two. Approximately 15,000 persons perished. The Rock of Jerusalem clove in two, then drew back together, by the will of God — exalted is He above all! The sea sank into the earth for a day and a night, and people entered it, gathering from it, but it turned back upon them and caused a number of them to perish" (translation by G.Makdisi).

شوال، يوم الاحد، عن رؤية وموافقة التقويم، ومضى شهر الصيام كاملا بغير خلف اوله واخره -والحمد لله- ونرجو من الله الكريم قبوله... وورد الخبر في يوم الخميس الى دار الشيخ الاجل ابن جرادة، في كتب من التجار، بانه حدثت بفلسطين والرملة زلزلة عظيمة، في الرابع والعشرين من رجب في هذه السنة، اذهبت جميع دورها الا دارين، وهلك نحو خمسة عشر الف نسمة، وانصدعت الصخرة التي ببيت المقدس بنصفين، ثم التأمت، باذن الله تعالى. وغار البحر يوما وليلة، ونزل الناس اليه يلتقطون منه وعاد عليهم فاهلك جماعة.

The report provided by the 12th century Arab historian Ibn al-Jawzi (248) is more concise. He was from Baghdad like his predecessor Ibn al-Banna, from whom he took his information about the earthquake (Ibn al-Jawzi's report was itself taken up later by the 14th century historian Ibn Kathir, in his *al-Bidaya wa 'l-nihaya fi 'l-ta'rikh* XII, p.99):

"In the month of *Jumada I* [8 March – 6 April 1068] the earth shook in Palestine. The town of Ramla was destroyed; the merlons [of the minaret] of the Mosque of the Prophet — God bless him and give him peace — [at Medina] also collapsed. The earthquake reached the villages of Wadi al-Safra' and Khaybar. The earth split open and treasures came forth. Its effects were also felt at Ruhba and Kufa. Some merchants described the earthquake in a letter, in which they said that the town of Ramla had completely collapsed, with the sole exception of two alleys. There were 15,000 victims [according to the letter]".

في جمادى الاولى كانت زلزلة بأرض فلسطين أهلكت بلد الرملة ورمت شرافتين من مسجد رسول الله صلى الله عليه وسلم ولحقت وادي الصفراء وخيبر وانشقت الأرض عن كنوز من المال وبلغ حسها الى الرحبة والكوفة. وجاء كتاب بعض التجار في هذه الزلزلة ويقول انها خسفت الرملة جميعا حتى لم يسلم منها الا دربان فقط وهلك فيها خمسة عشر ألف نسمة.

Information about the earthquake provided by the 12th century historian Ibn al-Qalanisi, who came from Damascus, is limited to Palestine and Syria:

"On Tuesday 10 of the month of *Jumada I* in that year [460 H.] there was a terrible earthquake in Palestine, which destroyed most of the houses and walls at Ramla, and

badly damaged its congregational mosque. Most inhabitants perished in the ruins. It was said that a schoolteacher was in his classroom with about 200 children, and the classroom roof collapsed on top of them, but no-one went to look for [their bodies] because their families had perished as well. It was also said that because of the intensity of the earthquake, water came out of the wells. At Baniyas about a hundred people perished in the ruins; and the same thing happened at Jerusalem”.

في يوم الثلاثاء العاشر من جمادى الأولى من السنة جاءت زلزلة عظيمة بفلسطين هدمت أكثر دور الرملة وسورها وتضعض جامعها ومات أكثر أهلها تحت الردم وحكى أن معلما كان في مكتبه به تقدير مائتي صبي ووقع المكتب عليهم فما سأل أحد عنهم لهلاك أهاليهم وأن الماء طلع من أفواه الآبار لعظم الزلزلة وهلك في بانياس تحت الردم نحو مائة نفس وكذلك في بيت المقدس.

Ibn al-Athir, an Arab historian from Mosul who was active in the late 12th and early 13th century, recorded information about earthquake effects in Palestine which were subsequently taken up by the 15th century historian Ibn Taghribirdi (*al-Nujum al-zahira*, V, p. 80). The former also mentions Egypt as an area where the earthquake was “very strong”:

“In the month of *Jumada I* there was a very strong earthquake in Palestine and Egypt, which destroyed Ramla. The water in wells rose to the surface, and 25,000 inhabitants perished. In Jerusalem, the rock [of the Mosque of ‘Umar, or perhaps the mosque itself, which was known as the Mosque of the Rock], split open, but by the will of God closed up again. The sea receded from the coast for a distance equal to a day’s journey, and when it came back it struck those who had approached the shore, killing a great many people”.

في جمادى الأولى كانت بفلسطين ومصر زلزلة شديدة خربت الرملة وطلع الماء من رؤوس الآبار وهلك من أهلها خمسة وعشرون ألف نسمة وانشقت الصخرة بالبيت المقدس وعادت بأذن الله تعالى وعاد البحر من الساحل مسيرة يوم فنزل الناس إلى أرضه يلتقطون منه فرجع الماء عليهم فأهلك منهم خلقا كثيرا.

There is a very detailed account of the earthquake in Sibt Ibn al-Jawzi, a famous historian who lived in the late 12th and early 13th century and was the son of Ibn al-Jawzi:

“On Tuesday 11 *Jumada I* [460 H. = 18 March 1068], there was an earthquake in Palestine which lasted for two and a half hours and destroyed the Ramla area. It was felt as far as Ruhba and Kufa, and only two of the main gates at Ramla were undamaged, and 15,000 townspeople were killed. In Ramla, there were two hundred children at school when it collapsed on top of them, and no-one went in search of them because their parents were dead. The rock of [the mosque of] Jerusalem split open, but then closed up again. Others say that it did not split open at all, but moved and then returned to its original position; and the sea receded [to a distance equal to] a day’s walk] and people went down to the sea bed to pick things up, but the sea came back at them and a large number were killed. Baniyas was destroyed, and loud thunder-claps were heard in the sky, and violent sounds which caused people to faint. The earthquake reached the Euphrates, whose waters overflowed its banks. An Alawite at Hejaz [Arabia], has said that in the period in question an earthquake caused the collapse [in Medina] of two merlons [on the minaret] in the Mosque of the Prophet — may the prayer of God and peace be with him — and the towns people were disturbed and thought it an ill omen: so they did penance, practised abstinence, poured away their wines and exiled adulterous women from the town. And the earthquake struck Wadi al-Safra’, Yunbu’, Badr, Khaybar, and Wadi al-Qura and spread throughout the Hejaz; and the earth split open and treasures were revealed, and gold, silver and jewels were found. The *dinar* was equivalent to one *mithqal* and a half by weight and a spring gushed forth [sufficiently violently] to be worth 2,000 *dinars* a year. At Tabuk, three

more springs appeared than had been there before. The earthquake completely destroyed the eastern part of the Hejaz, and it also destroyed Aylat, killing all its inhabitants, with the exception of 12 men who had gone fishing at sea. And a letter from some merchants in the month of *Rajab* [460 H. = 6 May - 4 June 1068] reported that when they arrived at Damascus, they found neither sultan nor market, and the people had taken over the city, and it was impossible to enter or leave. The commander of the army defeated the governor of Damascus, forcing him to withdraw to 'Usqalan, and the people destroyed the palace where he usually dwelt; and the same thing had happened throughout the Syrian territories and the nearby coastal area. And what is amazing is that we have seen that the earthquake affected coastal areas, Jerusalem, the Syrian territories, Medina, Tabuk and Tima, and the whole of the Hejaz and Al-Bilad al-Furatiyya [the Euphrates area]; and it all happened in a single night half way through *Jumada I* [460 H. = 22 March 1068]."

وفي يوم الثلاثاء حادي عشر جمادى الاولى على ساعتين ونصف كانت زلزلة بأرض فلسطين اهلكت بلد الرملة وبلغ حسها الى الرحبة والكوفة ولم يسلم من الرملة الا دربان فقط وهلك فيها خمسة عشر الف نسمة. وكان في مكتب الرملة نحو مائتي صبي فوقع المكتب عليهم فما سأل احد عنهم لموت اهلهم. وانشقت صخرة بيت المقدس ثم عادت وقيل ما انشقت بل زالت من موضعها ثم عادت وغار البحر مسيرة يوم ودخل الناس الى أرضه يلتقطون فرجع عليهم فاهلك منهم خلقا عظيما. وخربت باتياس وسمع من السماء رعود واصوات هائلة غشي على الناس منها- وشقت هذه الزلزلة الفرات ورفعت الماء الى جوانبها. وقال علوي من الحجاز كانت الزلزلة عندنا في الوقت المذكور فرمت بشرافتين من مسجد النبي صلى الله عليه وسلم فانزعج أهل المدينة وقالوا هذا تدبير بافة تصيبنا فتأبوا واقلعوا واراقوا الخمر ونقوا الخواطي من البلد. ولحقت الزلزلة وادي الصفراء وينبع وبدر وخيبر ووادي القرى وعمت الحجاز وانشقت الارض بينها عن كنوز وجدوا فيها الذهب والفضة والمصاغ. ووزن الدينار مثقال ونصف ونبتت فيها عين تشتغل كل سنة ألفا دينار. وظهر بتبوك ثلاثة عيون غير العين التي كانت بها واخذت الزلزلة من شرقي الحجاز جميعه وهلكت أيلة ومن فيها الا اثنا عشر رجلا اتفق انهم كانوا خرجوا الى ساحل البحر يصيدون السمك. وورد من بعض التجار كتاب في رج يقولون وصلنا الى دمشق وليس فيها سلطان ولا بيع ولا شراء وقد غلب أهلها عليها ولا يمكن احد الخروج منها ولا الدخول اليها وانهم امير الجيوش صاحب دمشق الى عسقلان ونقض العامة قصره الذي كان ينزله وجميع الشام والساحل المحيط. والمعجب انهم اعتبروا حال هذه الزلزلة فوجدوا السواحل والقدس والشام والمدينة وتبوك وتيماء والحجاز كله والبلاد الفراتية جميع زلزلت في ليلة واحدة وفي نصف جمادى الاولى.

Ibn Shaddad, an Arab historian from Syria (active in the 14th century) paid particular attention to what happened at Ramla:

"After becoming a city, Ramla was famous for its trade and as a work place; travellers went there and traders settled there, until the day when an earthquake struck, on 10 *Jumada I* in 460 [H. = 17 March 1068]. It destroyed houses and demolished the city walls, reducing it to rubble, and water overflowed from wells. The rock of Jerusalem split open and then came together again. A large proportion of the inhabitants of Ramla made for Aylat, rebuilt it, and turned it into a town".

لم تزل الرملة مذ صارت عامرة الاسواق. ودارة الارزاق. ينتابها السفار. ويحط بها التجار. الى ان جاءتها زلزلة. في العاشر من جمادى الاولى سنة ستين واربعمائة هدمت دورها. وشقت سورها. وعمت الآثار. واطلعت الماء من الآبار. وانشقت منها صخرة بيت المقدس والتأمت. فانتقل اكثر اهل الرملة بعد الى ايليا فعمروها ومصرها.

Al-Dhahabi (1247-1348), a historian and theologian from Damascus, gathered information about the earthquake from the chronicles of Ibn al-Athir, Abu Ya'la ben Qalanisi and Ibn al-Sabuni. He records that:

"In this year [460 H. = 1067-1068], there was a violent earthquake at Ramla which damaged it so badly that water overflowed from wells and, according to Ibn al-Athir, 25,000 inhabitants perished. Abu Ya'la ben Qalanisi records that there were about 200

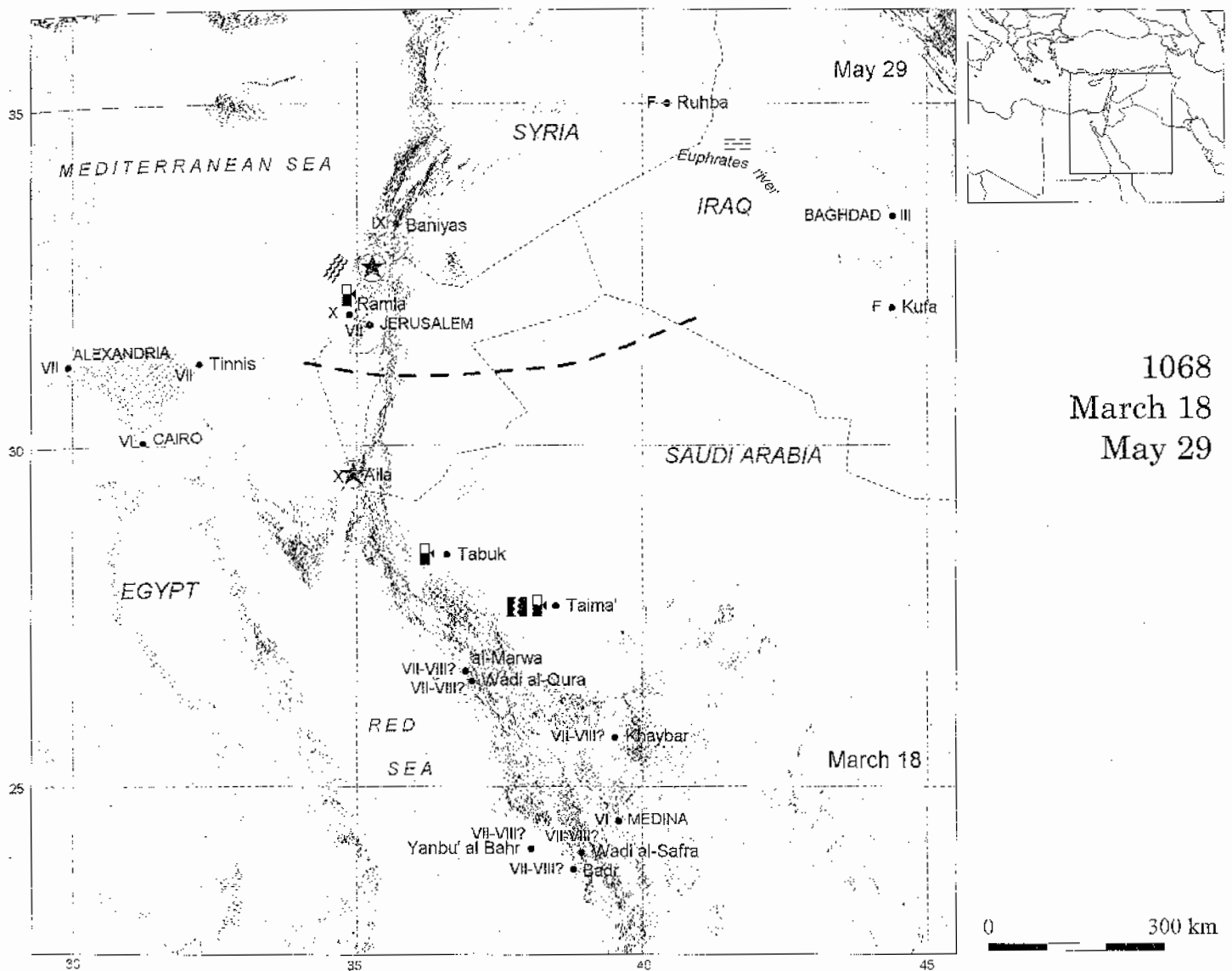


fig. 6 The line indicates the two probable areas of effects.

children in a school at Ramla when it collapsed on top of them, but no-one went to look for them because their families had perished as well, and Baniyas was struck in the same way. Ibn al-Sabuni has said: 'An Alawite who happened to be in the Hejaz, has told how there was an earthquake in the period mentioned, that is to say on Tuesday 11 *Jumada I* [460 H. = 18 March 1068], and how it caused two merlons [on the minaret] to collapse at the Mosque of the Prophet [at Medina] — may the prayer of God and peace be with him — and how the earth split open and gold and silver treasures came forth, and a spring gushed forth, and Aylat was destroyed with its inhabitants, and at Tabuk three springs all appeared at the same time. As for Ibn al-Athir, he has said that the rock of [the mosque of] Jerusalem split open and then came together again thanks to the will of God; and the sea receded from the shore for a distance equal to a day[s walk]; people went down along the sea bed to see what they could find, but the water came back over them and they perished'".

فيها كانت بالرملة الزلزلة الهائلة التي خربتها حتى طلع الماء من رؤوس الابار وهلك

من أهلها كما يقول ابن الاثير خمسة وعشرون ألفا. وقال ابو يعلي ابن القلانسي كان في مكتب الرملة نحو من مائتي صبي فسقط عليهم فما سأل أحد عنهم لموت أهاليهم وضربت بانبياس. وقال ابن الصابوني حدثني علوي كان في الحجاز أن الزلزلة كانت عندهم في الوقت المذكور وهو يوم الثلاثاء حادي عشر جمادى الأولى فرمت بشرافيتين من مسجد النبي صلى الله عليه وسلم وانشقت الارض بينها عن كنوز ذهب وفضة وانفجرت بها عين ماء واهلكت ايلة ومن فيها وظهرت بتبوك ثلاثة عيون وهذا كله في ساعة واحدة. واما ابن الاثير فقال وانشقت صخرة بيت المقدس وعادت باذن الله وأبعد البحر عن ساحله مسيرة يوم فنزل الناس الى أرضه يلتقطون فرجع الماء عليهم فاهلكهم.

While the effects of the earthquake in Egypt are recorded only in a sporadic and summary way in Arab sources, the report by the Coptic historian Sawirus ibn al-Muqaffa' is in that sense more detailed:

"Suddenly there was a violent earthquake at dawn on Tuesday, the second day of Easter [18 March 1068], such that various places were destroyed at Ramla, Tinnis and elsewhere, and at Alexandria. A subsequent epidemic was so severe that only about one hundred inhabitants survived, of the thousands who lived at Tinnis".

فاول ذلك حدوث زلزلة عظيمة ضحي نهار يوم الثلاثاء ثاني الفصح حتى انها اقلبت عدة مواضع بالرملة وتينيس وغيرها و بالاسكندرية وكان بعدها وبأ كثير حتى لم يبق في تينيس من الالوف التي كانوا فيها الا تقدير مائة نفر.

There is another passage (256) in the work of Sawirus ibn al-Muqaffa' where he records an earthquake as having occurred on 18 March in the year 1070, but since the information he provides is exactly the same as that given by Arab sources for the earthquake of 18 March 1068, it is almost certain that he has made a mistake over the date, and that what follows must refer to the 1068 earthquake:

"Amongst the events of that year [462 H.], at the third hour on Tuesday 11 *Jumada I*, corresponding to 18 *Adar* in the Syriac calendar [= 18 March 1070], there was a tremendous earthquake at Ramla and its district. The people fled, and its walls were destroyed. The shocks reached as far as Jerusalem and Tinnis [Tannis?]; Aylat completely collapsed. The sea receded so far during the earthquake that its bed was revealed and people could walk on the bottom until the sea returned to its normal level. One corner of the congregational mosque in Cairo moved. The earthquake was followed by two more shocks within the same period".

فمن الحوادث فيها انه بعد ثلاث ساعات من يوم الثلاثاء الحادي عشر من جمادى الأولى وهو الثامن عشر من آذار زلزلة عظيمة بالرملة وأعمالها فذهب أكثر أهلها وانهدم سورها وعم ذلك بيت المقدس وتينيس وانخسفت أيلة كلها وانجفل البحر في وقت الزلزلة حتى انكشفت أرضه ومشي الناس فيه ثم عاد الى حاله. وتغيرت إحدى زوايا الجامع بمصر وتبع هذه الزلزلة في ساعتها زلزلتان أخريان.

In the seismological literature and catalogues, the discrepancies between the sources as to the number of victims and the date of the earthquake have given rise to some mistakes.

Taher (1979, p.40) quotes Ibn al-Athir inaccurately, recording 25 victims at Ramla (whereas the Arab historian actually wrote "25,000" — a figure which itself clashes with that of 15,000, as generally accepted in Arab historiography). As for dating problems, Ben-Menahem (1979) speaks of an earthquake on 25 February 1070 at Ramla and Cairo; Taher (1979, p.41) does the same for an earthquake at Cairo and Damietta, taking the Muslim date of Tuesday 11 *Jumada I* (18 *Adar*/March) 460 H. as being in the year 1070 on p.41, but in 1169 on p.306. In connection with this earthquake, Taher also suggests (p.41; 128) that "the date corresponds to the year 460", i.e. to the earthquake which he dates to 18 March 1168. This doublet seems to have arisen from an insufficient analysis of the sources. Similarly, al-Hakeem (1988, p.21) gives two separate earthquakes, one in 1068 and the other in 1170 (in fact it was a different event; see below).

▲ 1068 03 18 6:30 UT ☉ = 29 33 34 57 I₀ = IX Me = 8.1 Sites: 13 EE: 2

localities	lat.	long.	I	localities	lat.	long.	I
Elat IL	29 33	34 57	X	Tinnis ET	31 12	32 14	VII
Badr SA	23 47	38 48	VII-VIII?	Cairo ET	30 03	31 15	VI
Al-Marwa SA	26 41	36 55	VII-VIII?	Medina SA	24 30	39 35	VI
Wadi al-Safra' SA	24 02	38 56	VII-VIII?	Al-Kufah IRQ	32 01	44 23	F
Khaybar SA	25 42	39 31	VII-VIII?	Baghdad IRQ	33 20	44 23	III
Yanbu' al Bahr SA	24 05	38 03	VII-VIII?	Tabuk SA	28 23	36 35	EE
Wadi al-Qura SA	26 32	37 01	VII-VIII?	Taima SA	27 38	38 29	EE
Alexandria ET	31 12	29 55	VII				

1068 05 29 ☉ = 32 34 35 17 I₀ = IX Me = 6.0 Sites: 4 EE: 1 Ts

localities	lat.	long.	I	localities	lat.	long.	I
Ramla IL	31 56	34 52	X EE	Jerusalem	31 46	35 14	VII
Baniyas SYR	33 14	35 42	IX	Ruhba SYR	33 03	37 27	F

< 035 > 1079 September 1 Seville [southern Spain]

inscriptions Seville, church of El Salvador, in *RCEA* (VII 1936, pp.205-6, no.2723) and Ciccarello (1996)
catalogues d. von Hoff (1840)

This earthquake is unknown to the seismic catalogue tradition.

During the night of 1 September 1079, an earthquake struck Seville in Spain, causing a minaret to collapse. It was rebuilt within a month, as we can tell from an

■ - inscription, now in the church of El Salvador in Seville:

"(In the name of God the Merciful, the Compassionate) Blessed be God and may he give peace to Muhammad, the seal of His prophets, the best of His intimates, and to his good and virtuous family! al-Mu'tamid 'ala 'l-lah, al-Mu'ayyad bi 'Nasr Allah, Abu 'l-Qasim Muhammad, b. 'Abbad — may God prolong his authority and continue the magnificence of his victory! — ordered the rebuilding of this minaret — may it always be full of the call to Islam — when it was destroyed by the many earthquakes which occurred during the night of Sunday the first of *Rabi I* in the year 472. It was completed, thanks to the aid and support of God, at the end of the said month. May God accept in this his generous works, and for every stone employed here, may it build for him a castle in His Paradise, in His Grace and Goodness! The work of Abu Ibrahim, b. Aflah ar-Rukhkhām ["the marble worker"], in the sight of the trusted *sahib al-ahbas* ["administrator of the mortmain"], the regent, Abu 'Umar Ahmad b. Tayyib — May God grant him success".

بسملة و صلى الله على محمد \ خاتم أنبيائه و خيرة أصفياك و على أهله الطيبين \
الابرار و سلم تسليمًا أمر العتمد على الله \ المؤيد بنصر الله أبو القاسم محمد بن عباد
\ أدام الله تأييد أمره و وصل إعزاز نصره \ بينان أعلى هذا المنار لا زال غزيرا
بدعوة \ الإسلام عند انهدامه لكثير الزلازل \ الكائنة ليلة الأحد مستهل ربيع الأول \
من سنة اثنتين و سبعين و أربع مائة فتم \ بحول الله و تأييده في عقب الشهر
المؤرخ \ قبل الله في كريم مشغلته و بنى له بكل حجر \ بنى فيه قصرًا في جناحه يمنة
و لطفه \ عمل أبي إبراهيم ابن أفلح الرخام على يدي الأمين صاحب الأحباس القيم أبي
عمر أحمد بن طيب وفقه الله

In von Hoff's catalogue (1840, p.211), which does not make use of primary sources, it is simply stated that there was an earthquake in Spain in 1081.

▲ 1079 09 01 at night

localities	lat.	long.	I
Seville	37 23	-05 59	VII

< 036 > 1083 August 18 Maghreb

source Ibn Abi Zar', *al-Anis*, II, p.96
literature Taher (1979)

This earthquake is unknown to the seismic catalogic tradition.

On 18 August 1083, there was a strong earthquake in the Maghreb, causing many deaths, the destruction of many houses, and the collapse of mosques and minarets. The seismic sequence lasted for four months, until the last day of *Jumada II* (13 November). The source for this earthquake is Ibn Abi Zar', a Moroccan Arab historian who was active in the late 13th and early 14th century:

"In the month of *Rabi' II* in that year [476 H.], there was a violent earthquake, the like of which had never been seen in the Maghreb. Houses were destroyed and many people perished in the ruins; mosques and minarets collapsed. The shocks persisted without pause every day and every night from the first day of the month of *Rabi' II* [18 August] until the last day of the month of *Jumada II* [13 November] in the said year".

وفي ربيع الآخر منها كانت الزلزلة العظيمة التي لم ير الناس بالمغرب مثلها. هدم
البنيان ومات فيها خلق كثير تحت الردم ووقع الجوامع والناارات ولم تزل الزلزلة تتعاقب
وتتكرر في كل يوم وليلة من أول يوم ربيع الآخر الى آخر يوم من جمادى الآخرة من
السنة المذكورة.

△ There are no elements with which to indicate the parameters.

< 037 > 1086 April 18 - 1087 April 7 [479 H.] Syria

sources Ibn al-Athir, *al-Kamil*, X, p.105; Abu 'l-Fida, *al-Mukhtasar*, II, p.199; al-Suyuti, *Kashf*, p.36
literature Taher (1979)
catalogues d. von Hoff (1840)
catalogues p. Poirier and Taher (1980); al-Hakcem (1988)

Between 18 April 1086 and 7 April 1087, a violent seismic sequence struck Mesopotamia, Iraq and Syria, as well as other areas not identified by the sources. There is evidence of widespread building collapses in Syria, and in the case of Iraq and Mesopotamia, it is simply stated that houses were temporarily abandoned by their inhabitants. A series of events was probably involved. The sources for this earthquake are the Arab historian Ibn al-Athir (1160-1233), the Syrian prince Abu 'l-Fida, an Arab who was active as a historian and geographer in the late 13th and early 14th century, and the Arab polygraph al-Suyuti (1445-1505), a native of Cairo. Ibn al-Athir tells us:

"In that year [479 H. = 18 April 1086 - 7 April 1087] there were earthquakes in Iraq, Mesopotamia, the Syrian territories and many other provinces. People abandoned their homes and fled into the desert, returning when calm returned".

فيها كانت زلازل بالعراق والجزيرة والشام وكثير من البلاد فخربت كثيرا من البلاد
وفارق الناس مساكنهم الى الصحراء فلما سكنت عادوا.

Abu 'l-Fida simply records that in the year 479 (H. = 1086-1087):

"there were such violent earthquakes that people abandoned their homes".

(وقبها) كانت زلازل عظيمة حتى فارق الناس ديارهم.

The information provided by al-Suyuti is more specific:

"In the year [479] (H. = 1086-1087), there were earthquakes in in Iraq, the Arabian peninsula and the Syrian territories, and numerous buildings were destroyed. Most

inhabitants in Iraq fled into the desert, returning to their homes later".

وفي سنة تسع وسبعين كانت زلازل بالعراق والجزيرة والشام فهدمت شيئا كثيرا من العمران وخرج اكثر اهل العراق الى الصحراء ثم عادوا.

In von Hoff's catalogue (1840, p.211), various earthquakes are recorded as having occurred in 1086, quoting Abu 'l-Fida 3.267.

△ There are no elements with which to indicate the parameters.

< 038 > 1087 September 10 Apulia [southern Italy]

sources 1 Lupus Protosp., *Ann.*, p.62; Ignotus civis barensis, *Cron.*, p.154

source 2 Romuald Sal., *Chron.*, p.198

historiography Pacca (ed. 1780); Di Meo (1795); Maggiulli (1893)

catalogues d. Filippo da Secinara (1652); Bonito (1691); Perroy (1848); Mallet (1853); Capocci (1861-63); Mercalli (1883); De Giorgi (1898); Baratta (1901); *Boschi *et al.* (1995, 1997, 2000)

catalogues p. Giorgetti and Iaccarino (1971); Carrozzo *et al.* (1973); Postpischl (1985); CPTI (1999)

The earthquake was felt in a large area of Apulia which cannot be identified accurately from the sources, since their reference to very serious damage to houses and towers is expressed only in general terms, as though the information came from oral reports in circulation.

Contemporary chroniclers record this earthquake: Lupus Protospata and the unidentified citizen of Bari (*civis barensis*) (so called by the 1724 editor of his text). Lupus Protospata in his *Annales* record:

"1088. An earthquake felt throughout Apulia in the month of September was so strong that they say towers and houses collapsed in some places. That was the time when the war began between Lord Roger and his brother Bohemond".

1088. mense Septembris factus est grandis terremotus per totam Apuleam, ita ut in quibusdam locis turres ac domos subruisse fertur; tunc enim coepta est guerra inter Rogerium ducem et Boamundum, fratrem eius.

Lupus' reference to earthquake damage probably derives from oral accounts, since he uses a generic "they say" (*fertur*) that houses and towers collapsed, rather than telling us so directly. The lack of greater detail supports the view that the damage occurred at some distance from the area about which he usually provides more detailed descriptions, that is to say an area embracing Ascoli Satriano, Acerenza, Matera and Trani. The unidentified citizen of Bari was a chronicler who died towards the mid-12th century. He writes in his *Chronicon*:

"1088. Eleventh indiction. On 10 September, the sixth day of the week [Friday], a great earthquake struck the whole of our land, shaking it to its foundations".

Millesimo LXXXVIII. Indictione XI. In mense Septembris X. die intrante, feriâ VI. magnus Terremotus factus est per omnem terram nostram, ut fundamenta moveret.

A reference in the later work of Romuald of Salerno, a bishop of Salerno who lived between the early 12th century and 1181, derive from Lupus Protospata. Romuald writes in his *Chronicon*:

"In the year of the Incarnation of Our Lord 1087. [...] In this year there was so great an earthquake throughout Apulia that they say towers and houses collapsed in some places".

Anno dominice incarnationis MLXXXVIIJ. [...] Hoc anno terre motus magnus factus est per totam Apuliam, ut in quibusdam locis turres ac domos subruisse feratur.

The sources provide an apparently contradictory chronology. Lupus Protospata dates the earthquake to September 1088, the unidentified citizen of Bari specifies Friday (*feriâ VI*) 10 September, while Romuald of Salerno dates it to the year 1087. Since 10 September was a Friday in 1087 (but not in 1088), that must be the year in which the earthquake occurred. Lupus Protospata and the unidentified citizen of Bari both date the earthquake to 1088 because they are adopting the Byzantine indiction system in which the year began on 1 September, with the result that events occurring between that date and 31 December differ by one year from modern calculations. But Romuald of Salerno must have converted the dates to the modern system when he took over his information from Lupus.

Compared with the text of Lupus Protospata, furthermore, that of the unidentified citizen of Bari situates the earthquake in a slightly different and somewhat ambiguous way. For whereas Lupus states that the earthquake was felt throughout Apulia (*per totam Apuleam*), the unknown citizen of Bari writes that it occurred throughout our land (*per omnem terram nostram*). This latter expression presents a problem of interpretation, because it may refer either to *Apulia* as a whole, or else to the city of Bari and its surroundings, where the writer presumably lived.

It seems clear that the chroniclers of the time saw the earthquake as an exceptional event. Lupus Protospata was a perceptive historian of Norman *Apulia*, and directly associates the earthquake with the beginning of the war of succession between Bohemond and Roger, the two heirs of Robert Guiscard. After recording the earthquake, he explains that in the same year a war began which led to the war of succession between the heirs of Robert Guiscard, and to a period of political and institutional instability. The fact that the two events (one natural and one political) occurred in close chronological proximity gave the earthquake considerable symbolic significance, and hence provided a perhaps more cogent reason for including it in a chronicle of the time than the seriousness of the damage it caused.

The earthquake is not mentioned in the *Codice Diplomatico Barese* or *Pugliese*.

Maggiulli (1893), a local historian, provides the otherwise unknown item of information that the palace of Roger I at Otranto collapsed, basing his statement on a *Cronistoria* of Otranto, which was probably a late work of local historiography. There is no contemporary evidence to support this suggestion.

▲ 1087 09 10

localities	lat.	long.	I	localities	lat.	long.	I
Apulia	41 15	16 00	IX	Bari	41 06	16 51	V-VI

< 039 > 1090 December 6 Constantinople [north-western Turkey]

sources 1 Zon., *Epit.*, 18.22.32, III, p.740; Glyc., *Ann.*, p.620

sources 2 Mich. Syr., 15.6, *Chron.*, IV, p.583; Ephr., *Chronogr.*, 3532-7

historiography Ducellier (1980)

catalogues d. Bonito (1691); Mallet (1853); Perrey (1850); Dück (1904); Downey (1955); Grumel (1958); *Papazachos and Papazachou (1997)

catalogues p. Ergin *et al.* (1967); Shebalin *et al.* (1974)

On 6 December 1090 at about 10:00 UT (at the sixth hour of the day), Constantinople was struck by a strong earthquake, which caused the collapse of many houses, arcades and churches, and also killed many people.

Information about this earthquake is to be found in Glycas, a Byzantine historian who lived in the second half of the 12th century:

"There was also such a violent earthquake at the sixth hour of the day, on the day of

the feast of St.Nicholas [6 December 1090], that it caused many houses, arcades and churches to collapse, and many people were buried and died there”.

γέγονε δὲ τριηκοῦτα καὶ κλόνος τῆς γῆς ἐξ ἡμέρας ἐν αὐτῇ τῇ μηνίμῃ τοῦ ἁγίου Νικολάου, ὑφ’ οὗ πολλὰ οἰκία καὶ στοὰ καὶ ναοὶ κατέπεσον, ὡς ἐντεῦθεν καὶ πολλοὺς συγχωσθῆναι καὶ ἀποθανεῖν.

Zonaras provides essentially similar information, recording simply that the event occurred on the feast of St.Nicholas (6 December) during the reign of Alexius I Comnenus [1081-1118].

There is an echo of this narrative in the verse chronicle of Ephraim, a Byzantine poet who lived in the late 13th and early 14th century.

Michael the Syrian also refers to this earthquake, though he dates it to 1084-85:

“And in the year thirteen hundred and ninety-six [of the Greeks, 1084-85], there was an earthquake in Constantinople and innumerable thousands of people were suffocated”.

.. καθ' ἑξῆς ἐθασι μισθὸς τρεῶν καὶ κατὰ οὗτ' αὐτῶν

Michael the Syrian dates the earthquake to three years after the Antioch earthquake, though the latter must in fact have occurred about 1091. It may be, however, that his chronology is similar to that used by Arab authors who record an earthquake at Antioch in 1086.

Bonito (1691, pp.443-4) dates this earthquake to 1084. Other catalogues (Perrey 1850, p.15; Mallet 1853, p.21; Dück 1904, p.133; Ergin *et al.* 1967) date it to 1082 or 1083; Downey (1955) gives 1081; Shebalin *et al.* (1974, sheet 9) give the date 1082 or 1088; Ducellier (1980, p.106) prefers the date provided by Glycas.

▲ 1090 12 06 10:00 UT

localities	lat.	long.	I
Istanbul	41 02	28 57	VIII-IX

< 040 > **1091 January 27-28 Rome [central Italy]**

sources 1 *Necrologio di S.Maria in Trastevere*, I, p.88; *Liber Pont.*, p.290

sources 2 *Catalog. imperat. et pont. Roman. Cenc.*, p.106; *Cron. apostol. et imperat. Basil.*, p.291; Milioli, *Liber*, p.429

art history Kinney [1976]

literature Guidoboni (1995)

This earthquake is unknown to seismic catalogues, but not entirely to art historians (Kinney 1976) and seismological studies (Guidoboni 1995). But it remains rather obscure, although reported in two authoritative sources: the *Necrologio* of the church of S.Maria in Trastevere (ed. Egidi 1908) and the *Liber Pontificalis* (ed. Duchesne 1892); and it is also recorded in later chronicles.

The first source is an 11th century text in a miscellaneous codex in the British Library (Add. 14801). The first part of the codex contains the *Martirologio Girolamiano*, a calendar of all the religious festivities. Beside these, the canons of S.Maria in Trastevere recorded the deaths of laymen and churchmen who died from the end of the 11th century to the mid-12th century. And detailed information about the life of the church was also included in the calendar. The following item is to be found at 27-28 January 1091 (VI-V *Kalendas Februarii*):

“On the sixth and fifth days before the Calends of February in the year of Our Lord 1091, in the fourteenth indiction, on this very day in the silence of the night beyond the Tiber and in Rome, there was a strong earthquake”.

VI-V Kalendas Februarii Anno Domini .MXCI., indictione XIII. in hac quippe die noctisque silentio trans Tiberim et Rome ingens terre motus fuit.

Given the nature of the source, this item of information is fairly reliable; but it is brief and does not allow us to conclude that the earthquake was destructive, for there is no mention of damage to the church. However, the use of the term "ingens" suggests that this was a substantial event. It is at least possible that damage was not mentioned because it was there for all to see; but that is no more than speculation.

The second source is the *Liber Pontificalis*, compiled at the end of the 12th century by a monk called Pierre-Guillaume: an earthquake is recorded at the year 1084, but it is also stated that there was a great famine and an eclipse of the sun in that year, and that Castel Sant'Angelo was taken. The linking of the earthquake with the capture of Castel Sant'Angelo makes it possible to establish that Pierre-Guillaume made a dating error and that the earthquake referred to actually occurred in 1091.

"In that year [1084, but in fact 1091], there was so great a famine throughout the world that many people died. And the sun suffered an eclipse, and the earth was shaken, and the Castel Sant'Angelo was taken".

Eodem anno [1084, but in fact 1091] per totum orbem magna fames fuit, ita quod exinde multi homines mortui sunt. Et sol eclipsin passus est, terra mota est, castrum sancti Angeli captum est.

The earthquake is also recorded in other secondary 12th and 13th century sources: the *Catalogus imperatorum et pontificum Romanorum Cencianus* (ed. Waitz 1879) is a list of all the popes and emperors up to the end of the 12th century. As in the case of the *Necrologio*, no damage is recorded.

"At the time of pope Urban [II, 1088-1099] and the emperor Henry [IV, 1084-1106] there was an earthquake in Rome on the feast of Saint Agnes [28 January]".

Tempore Urbani pape et Henrici imperatoris terre motus fuit Rome in festo sancte Agnetis.

The *Cronica Apostolicorum et imperatorum Basileensia* (ed. Holder-Egger 1903) is a chronicle-catalogue compiled in the opening years of the 13th century, whose form and structure are similar to those of the previous source.

There is also a report in general terms of an earthquake at the time of pope Urban II (1088-1099) when Castel S. Angelo was taken, in the *Liber de temporibus et actatibus*, attributed to Alberto Milioli (13th century), a notary from Reggio Emilia.

The art historian Dale Kinney (1975) has expressed the opinion that an 11th century earthquake severely damaged the church of S. Maria in Trastevere and that of S. Crisogono. The basis for this hypothesis is found by Kinney in the *Necrologio* of S. Maria in Trastevere and hence in the 1091 earthquake. This latter church is one of the oldest in Rome, and we know that it was completely rebuilt by pope Innocent II (1130-1143). These various factors lead us to believe that the earthquake was so strongly felt in Rome as to deserve being recorded; but while we cannot exclude the possibility of damage, there is no specific evidence for it.

▲ 1091 01 27-28

localities	lat.	long.	I
Rome	41 54	12 29	VII?

(041) 1091 September 26 Antioch [southern Turkey]

sources Mich. Syr., 15.6, *Chron.*, IV, p.583; Matth. Edess., *Chron.*, 2.93; Smbat, *Ann.*, p.96; Ibn al-Qalanisi, *Dhayl*, pp.120-1; Ibn al-Athir, *al-Kamil*, X, p.356

historiography Ducellier (1980)
 literature Abich (1882); Taher (1979); Poirier *et al.* (1980)
 catalogues d. von Hoff (1840); Perrey (1850); Mallet (1853); Sieberg (1932a); Stép'anyan (1964); Grumel (1958); Zeyt'unyan (1991)
 catalogues p. Ergin *et al.* (1967); Poirier and Taher (1980); al-Hakeem (1988); Bektur and Alpay (1988)

On 26 September 1091, a strong earthquake caused serious damage at Antioch where, according to the more reliable sources, 86 (or 70) towers and the greater part of the city walls collapsed. Houses also collapsed, many people were killed, and a church was badly damaged. Reconstruction work began immediately after the earthquake. The earthquake was strongly felt in Syria, where many people temporarily abandoned their homes. A late Armenian source records that the earthquake also struck Nisibis, but does not specify its effects there.

The earthquake is recorded in Syriac, Armenian and Arabic sources.

Michael the Syrian, a 12th century Syrian historian, records:

"In the year thirteen hundred and ninety-three (of the Greeks, 1081-1082) ... and in that year there was an earthquake and 86 towers in the walls of Antioch collapsed".

Տեղի վրա եղած զեղեռնութեան յիշատակն յայտնեմք զայն թիւով զորով քաղաքի պարսպի պարսպի վրայ 86 աշտարակներ ընկան և քաղաքի պարսպի վրայ ընկան և քաղաքի պարսպի վրայ ընկան ...

Matthew of Edessa, an Armenian historian who was active in the early 12th century, provides a more detailed account:

"In this same year [540 = 27 February 1091 – 26 February 1092], during the month of September, an earthquake occurred throughout the whole land, and all living creatures under heaven trembled and shook. Much destruction occurred in the city of Antioch, and many towers collapsed to their foundations. Moreover, the greater part of the walls of Antioch collapsed, and many men and women perished in the ruins of their homes".

Յայտնում ամի շարժեալ եղել ընդ ամենայն երկիր յամստանն սեպտեմբերի, և սաստկապէս երերալով դողալով, և արարածք հանդերձ ամեանյն արարածօծս որ ՚ի ներքոյ երկնից. եւ լինէր կործանումս մեծ ՚ի քաղաքին Անտիոքայ, և բազում աշտարակք հիմն ՚ի վեր տապալեցան, և անկաւ մեծ մասն պարսպին Անտիոքայ, և բազում արք և կանայք մեռան ՚ի ներքոյ բնակութեան իւրեանց:

Another Armenian historian, Smbat Sparapet — who lived in Cilicia between 1208 and 1276 and usually depends on Matthew of Edessa for his information — adds to the latter's account that the earthquake also affected "Mcbin", the Armenian name for Nisibis. Smbat Sparapet probably obtained this item of information from a source other than Matthew of Edessa (or from a more complete manuscript of his work). We take this information from Stép'anyan (1964, p.53).

There is also information about the earthquake in chronicles compiled by three Arab historians. The reliable historian Ibn al-Qalanisi (who died at Damascus in 1160) records the Antioch earthquake and dates it to 6 October 1091:

"During the night of Tuesday 9 *Sha'ban*, in that year [484 H. = 26 September 1091], there was a tremendous and dreadful earthquake in the Syrian territories such as had never been felt before. People came out of their houses for fear of another shock. It was said that many houses were destroyed in Antioch and that the church of the Virgin was damaged. Many people perished in the ruins, and about seventy towers in the city walls collapsed. The city remained in that state until the sultan Malik Shah [a Seljuk sultan, 1055-1092] ordered it to be rebuilt".

في ليلة الثلاثاء التاسع من شعبان من السنة حدث في الشام زلزلة عظيمة هائلة لم يسمع بمثلها وخرج الناس من دورهم خوفا من عودها . وحكى أن دورا كثيرا خربت

بأنطاكية واضطربت كنيسة السيدة فيها وهلك خلق كثير بالردم وأنهدم تقدير سبعين برجاً من سورها وبقيت على حالها إلى أن أمر السلطان ملك شاه بعمارها ولم ما تشعث منها.

Ibn al-Athir (1160-1231) provides similar information, but dates the earthquake to 9 *Sha'ban* in the year 484 of the Hegira, corresponding to 26 September 1091:

"On 9 *Sha'ban* in this year [484 H. = 26 September 1091], there were numerous earthquakes in the Syrian territories and in many other regions, but mostly in the Syrian territories, and its inhabitants abandoned their houses. Many houses collapsed at Antioch and a great many people perished in the ruins and 90 towers along its walls were destroyed. The sultan Malik Shah ordered them to be rebuilt".

وفيها في تاسع شعبان كان بالشام وكثير من البلاد زلازل كثيرة وكان أكثرها بالشام ففارق الناس مساكنهم وأنهدم بأنطاكية كثير من المساكن وهلك تحتها عالم كثير وخرّب من سورها تسعون برجاً فأمر السلطان ملكشاه بعمارها

Finally, the 15th century historian al-Ajami provides a brief account of earthquake effects at Antioch, dating the event to the year 485 [1092/3] ("Earthquake which destroys 90 towers in the city walls at Antioch"). This is close to the figure of 86 towers given by Michael the Syrian.

In the seismological literature, we find that certain ambiguities in the sources have led to earthquake effects being attributed to places not actually mentioned there. Abich (1882, p.436) and the catalogues of Ergin *et al.* (1967, p.16, no.135) and al-Hakeem (1988, p.21, no.131) incorrectly infer that the earthquake also affected Edessa, evidently assuming from Matthew of Edessa's account, in which he speaks of a "universal earthquake", that he was including his own city. But Matthew probably obtained his information from Armenian sources, and hence in using the expression "universal earthquake" he was probably referring in particular to Armenian controlled territory, that is to say Cilicia — which is, moreover, not far from Antioch.

Taher (1979, p.42), on the other hand, uses the text of Ibn al-Qalanisi, who mentions the collapse of 70 towers at Antioch, thereby neglecting the more reliable information provided by Michael the Syrian. Finally, some catalogues (Mallet 1853, Sieberg 1932a, al-Hakeem 1988, Bektur and Alpay 1988) have created a doublet by recording one earthquake on 17 September 1091 and another in 1092.

▲ 1091 09 26

localities	lat.	long.	I	localities	lat.	long.	I
Antioch	36 14	36 07	VIII-IX	Nusaybin	37 05	41 11	III-IV

< 042 > 1094 May 19 - June 18 [Jumada I 487 H.] Syria

sources: Ibn al-Qalanisi, *Dhayl*, p.127; Ibn al-Athir, *al-Kamil*, X, p.238

literature: Taher (1979)

catalogues p. al-Hakeem (1988)

Between 19 May and 18 June 1094, the Syrian territories were struck by a sequence of earthquakes with frequent shocks but no serious damage.

The sources for this event are two Arab historians: Ibn al-Qalanisi (who died at Damascus in 1160) and Ibn al-Athir (1160-1231).

The former records:

"During the month of *Jumada I*, there were earthquakes night and day, such as had never been seen before. Each shock lasted longer than usual".

في الوقت (جمادى الأولى) حدث زلازل وفي يوم وليلة دفعات لم يسمع بمثلها في كل زلزلة منها تقيم وتطول بخلاف ما جرت بمثله العادة.

Ibn al-Athir tells us, on the other hand:

"In that month there was a series of many earthquakes in the Syrian territories, lasting for a long time, but they did not cause great destruction".

وفي هذا الشهر كانت بالشام زلازل كثيرة متتابة يطول مكثها إلا أنه لم يكن الهدم كثيرا.

Al-Hakeem (1988, p.21) attributes an intensity of grade VII (MM) to this earthquake, but does not identify an epicentral area.

△ There are no elements with which to indicate the parameters.

< 043 > 1097 December 30 Antioch area [southern Turkey]

> light phenomena <

sources 1 Raym. Aguil., *Hist.*, pp.245, 253-4; Fulk Chart., *Hist.*, p.341; Ralph Caen, *Gesta*, pp.646-7

sources 2 *Estoire de Jerus. et d'Ant.*, III; Accolti, *Hist.*, p.466

historiography Ducellier (1980)

catalogues d. Sieberg (1932a); Zeyt'unyan (1991)

On 30 December 1097, a strong earthquake struck the Antioch region, terrifying the crusaders who were besieging the city. There is no mention of this earthquake in parametric catalogues, but a little is known about it, and it does appear in historiography and early 20th century seismological studies (Sieberg 1932a). The sources are three Latin historians writing at the time of the First Crusade: Raymond of Aguilers, Fulk of Chartres and Ralph of Caen, the first two of whom personally experienced the earthquake. Raymond of Aguilers reports very briefly that while the crusaders were having great difficulties in their siege of Antioch in the winter of 1097-1098:

"Meanwhile there was a great earthquake on the third day before the Calends of January [30 December 1097]; and we saw an amazing sign in the heavens. For shortly after nightfall, the sky in the north became so red that it almost seemed that the dawn of a new day had come".

Interea terrae motus factus est magnus III kalendas Januarii; et signum in coelo satis mirabile vidimus. Namque, in prima vigilia noctis, ita coelum rubicundum a septentrione fuit, ut quasi suborta aurora diem deferre videretur.

There is an indication that this earthquake did indeed strike the Antioch region in a later passage in the same author's text (chap.X, pp.253-4):

"Since the count and the bishop asked him for all the Christian news and orders, he replied: 'When the earthquake near Antioch began, and while the Frankish army was besieging the city, I was so struck with terror that all I could say was — Lord, help me — [...] But when, as I said, the earth continued to shake and the terror within me continued to increase, two men appeared before me, dressed in shining white'".

Quumque ab eo comes et episcopus revelationis et jussionis apostolicae ordinem requirerent, respondit: "In primo terrae motu, qui apud Antiochiam factus est, quum exercitum Francorum obsideret eam, tantus timor me invasit, ut nihil praeter 'Deus adjuva me' dicere possem. [...] Quum autem, ut dixi, concussio terrae diutius duraret, et timor meus semper excresceret, coram me duo viri adstiterunt in veste clarissima".

The speaker is a Provençal peasant (*rusticum quendam*) from among the crusaders' followers, who claims that at the moment when the earthquake struck, he had a vision of

St. Andrew, who showed him where the lance which pierced Christ's side was hidden in Antioch. St. Andrew was thus one of the two figures in shining white who appeared to the peasant, the other being an angel.

The evidence provided by Fulk of Chartres is particularly valuable, because he and Baldwin, the future king of Jerusalem, were both in the upper Euphrates valley at the time, and so he was an eye-witness of both the atmospheric and seismic phenomena. The red sky can be interpreted as ionisation of the air before the earthquake:

"At that time we saw the sky grow red in an amazing fashion; whereupon we felt a great earthquake, which frightened us all. At the same time, many people also saw a sign in the shape of a cross, white in colour, which moved straight towards the East".

Tunc temporis vidimus in caelo unum ruborem mirabilem: insuper sensimus terrae motum magnum, qui nos pavidos reddit omnes. Multi etiam tunc viderunt quoddam signum in modum crucis figuratum, colore alburnum, versus Orientem recto incedens tramite.

Ralph of Caen was in the East from 1107 onwards, and he makes a very brief reference to the earthquake by listing it in a series of calamities and celestial prodigies which troubled the crusaders during their siege of Antioch and sorely tried their patience:

"Time passes, and I must speak of the siege again, to relate how little the crusaders achieved in proportion to their sweat and labour; for in his [Tancredi's] army, although eight months had gone by, many were still making great efforts to achieve many things, and indeed the noblest carried out memorable exploits; but from the noblest to the humblest they endured great hardships: hunger, an earthquake, floods, and numerous frightening celestial phenomena".

Monet me tempus ad intermissamo redire obsidionem, ut vel quantulam de sudore tanto qui sudavere accipiant mercedem: nam in ejus exercitu, jam fere octimensis mora, multi strenue multa, maxime majores viri majora fecerunt; socialiter autem summi, mediocres et imi gravia pertulerunt, famem, terrae motum, aquarum inundationem, aeris terrores varios.

Ralph of Caen refers to the earthquake again shortly afterwards, as he continues his description of the siege of Antioch, for he includes it amongst a continuous series of phenomena which were held to be prodigious and which severely tested the crusaders, but without breaking their spirit:

"The siege began during the winter season, when every kind of winter hardship had to be endured: rainstorms, which could be sudden and prolonged; frequent movements of heaven and earth, so that any balance between the elements was destroyed, and it seemed that things would rise up into the sky or plunge into the entrails of the earth. And then there was the raging of winds and storms. Their fury swept away tents and camps, and only with difficulty could a large building or tower remain standing".

Cooperat cum hieme obsidio, per quam evoluta universos hiemis pertulit horrores; aquae diluvia, nunc subita, nunc continua; tantos coeli terraeque motus, ut soluto elementorum foedere, haec ad summa surgere, illud ad ima corruere videretur. Nam quid de turbinibus, quid de ventorum rabiem dicam? Illis grassantibus, nec tentorium stabat, nec mapale, vix palatium seu turris.

The anonymous author of the *Estorie de Jerusalem et d'Antioche* describes the earthquake in the same terms as Fulk of Chartres.

▲ 1097 12 30

localities	lat.	long.	I	localities	lat.	long.	J
■ Antioch area TR	36 14	36 07	VII-VIII?	■ Upper Euphr. Valley	36 04	38 05	V

< 044 > c.1099 Constantinople [north-western Turkey] doubtful event

source Comnena, Alex., 15.8.8
historiography Ducellier (1980); Rigo (1992a)

Anna Comnena, daughter of the emperor Alexius I Comnenus (1081-1118), was also an 11th - 12th century Byzantine historian. In narrating the investigation and trial of Basil, head of the Bogomils of Constantinople, carried out by her father, she records that Basil was first of all placed under house arrest at the home of a certain Parasceviotes, near the imperial palace, where the guardian apparently heard noises and even an earthquake "provoked" by Basil.

He declared on oath:

"that he had heard the clatter of stones hurled to the ground and on to roof tiles, and had seen them continually falling, even though there was no-one anywhere to throw them. This throwing of stones was accompanied by an earthquake which had shaken the floor and the roof".

[ιδεῖν τε καὶ ἀκοῦσαι μὲν τοὺς τῶν βαλλομένων λίθων καὶ κατὰ γῆς καὶ κατὰ κεράμων κρότους, ἰδεῖν δὲ συνεχεῖς καὶ ἀλλεπαλλήλους τοὺς λίθους, μηδένα δὲ μηδαμοῦ τὸν βάλλοντα τούτους θεάσασθαι. Συνεπελάμβανε γὰρ τῇ τῶν λίθων φορᾷ καὶ σεισμός τις ἀθρόος καὶ τὸ ἐπίπεδον ἐκεκλόνητο καὶ τὰ περὶ τὸν ὄφορον ἐτετρύγησαν.

As regards the chronology of this event, Ducellier (1980, p.106) gives the date 1118, probably by reference to one of the many dates proposed for the sentence on Basil. But, as has been shown (Rigo 1992a), the trial of Basil must have taken place about 1099.

The earthquake must therefore be placed around that date. However, there are still strong doubts about the reality of the event, which is narrated in a "demonological digression" by Anna Comnena, who is concerned to present the chief of the heretics in as unpleasant a light as possible.

< 045 > 1103 February Melitene area? [south-eastern Turkey]

source Mich. Syr., 15.8, Chron., IV, pp.588-9

This earthquake is unknown to the seismic catalogue tradition.

Michael the Syrian, a 12th century monk, mentions that there were many earthquakes in the first week of February 1103, but he does not describe their effects, nor does he explicitly state the location. Since he was a native of Melitene, which stood near present-day Malatya (south-eastern Turkey), became archimandrite at the monastery of Bar Sauma, which was situated near Melitene, it seems reasonable to suppose that the earthquake struck the Melitene area.

He writes:

"And in the year fourteen hundred and fourteen [of the Greeks, 1 October 1102 - 30 September 1103], at the beginning of Lent, that is to say in the first week in the month of Shebat [February], there were several earthquakes each day and at all places; some explained that the breaking of the period of fasting the previous year could be the cause of the scourge".

καὶ ἐν τῷ μηνί τούτῳ ἐγένετο σεισμοὶ πολλοὶ καὶ ἐν τῇ πόλει καὶ ἐν τοῖς χωρίοις
καὶ ἐν τῇ πόλει καὶ ἐν τοῖς χωρίοις καὶ ἐν τῇ πόλει καὶ ἐν τοῖς χωρίοις
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καὶ ἐν τῇ πόλει καὶ ἐν τοῖς χωρίοις καὶ ἐν τῇ πόλει καὶ ἐν τοῖς χωρίοις

Since there are no specific references to serious consequences, the shocks were presumably weak.

△ There are no elements with which to indicate the parameters.

< 046 > **1105 December 24 Jerusalem**

sources 1 Fulk Chart., *Hist.*, p.415; Bart. Nang., *Ad gesta*, p.542; Lis. Tours, *Ad secund.*, p.567

sources 2 *Auct. Ursic.*, p.471; Vinc. Beauv., *Spec. hist.*, p.1043a; Sicard, *Chron.*, col.584; Milioli, *Cron. imp.*, p.632

catalogues d. Bonito (1691); Mallet (1853); von Hoff (1840); Perrey (1850); Sieberg (1932a); *Ben-Menahem (1979); Amiran *et al.* (1994)

On 24 December 1105, an earthquake frightened all the inhabitants of Jerusalem. Since no other effects are recorded, we can assume that it did not cause serious damage. The sources are three Latin historians of the Crusades: Fulk of Chartres, Bartolf of Nangis and Lisiard of Tours, the first of whom was an eye-witness.

Fulk of Chartres records:

"[...] towards the end of that year, all we who were in Jerusalem felt a great earthquake, which severely frightened us, on Christmas Eve".

[...] ipso anno declinante [1105], sensimus omnes terrae motum grandem, qui Iherusalem ineramus, quod in vigilia Nativitatis Domini [24 December] valde nos terruit.

Bartolf of Nangis, who reworked Fulk's text around 1108, repeats more or less what Fulk had written:

"In that same year in which that battle was fought [the fighting between king Baldwin of Jerusalem and al-Afdal, vizier of the caliph of Egypt], there was a great earthquake on Christmas Eve, which was felt by all those who lived in Jerusalem".

Eodem anno quo praelium istud factum est, contigit in vigilia Natalis Domini terrae motum magnum valde, ita ut omnes qui habitabant Iherusalem persentirent.

Lisiard of Tours, who lived in the second half of the 12th century, and is considered to be the author of a kind of epitome of Fulk of Chartres' work, specifies that the earthquake was accompanied by horrible noises (*horrisonus*) and, in more general terms, he tells us:

"The whole of Jerusalem was struck, and the hearts of all were filled with great terror".

terrae motu Iherosolimam totam concussit, omniumque corda nimio terrore perterruit.

Vincent of Beauvais, a later author (13th century), mentions the earthquake very briefly, but his remark is useful from a chronological point of view, since it relates the earthquake to a specific year in the reign of the emperor Henry IV:

"In the forty-ninth year of the reign of Henry, that is to say, the year 1105 since the Incarnation, on Christmas Eve, there was a great earthquake at Jerusalem".

Anno imperii Henrici quadragesimo nono, scilicet ab incarnatione Domini MCV, vigilia Natalis Domini, terraemotus factus est in Hierosolymis.

▲ 1105 12 24

localities	lat.	long.	I
Jerusalem	31 46	35 14	VI-VII?

<047> 1108 September Melitene area? [south-eastern Turkey]

source Mich. Syr., 15.10, Chron., IV, p.593

This earthquake is unknown to the seismic catalogue tradition.

Michael the Syrian, a 12th century monk, mentions that there was a strong earthquake in September 1108, causing collapses in many places which he does not identify. Since he was a native of Melitene, which stood near present-day Malatya (south-eastern Turkey), became archimandrite at the monastery of Bar Sauma, which was situated near Melitene, it seems reasonable to suppose that the earthquake struck the Melitene area. He writes:

"In the year fourteen hundred and nineteen [of the Greeks, 1 October 1107 - 30 September 1108]... and in that year, in the month of *Elul* [September], there was a strong earthquake and many important places were reduced to ruins".

ⲙⲟ ⲗⲁⲟ ⲛⲁⲟⲩ ⲗⲁⲓ ⲛⲁⲟⲩ ⲗⲁⲓ ⲗⲁⲓ ⲗⲁⲓ ⲗⲁⲓ ⲗⲁⲓ ⲗⲁⲓ ⲗⲁⲓ ⲗⲁⲓ ⲗⲁⲓ ⲗⲁⲓ ⲗⲁⲓ
... ⲗⲁⲓ ⲗⲁⲓ ⲗⲁⲓ ⲗⲁⲓ ⲗⲁⲓ ⲗⲁⲓ ⲗⲁⲓ ⲗⲁⲓ ⲗⲁⲓ ⲗⲁⲓ ⲗⲁⲓ ⲗⲁⲓ

△ There are no elements with which to indicate the parameters.

<048> 1111 August 31 Lower Egypt

sources 1 al-Makin, *Kitab*, p.298; [Butrus al-Rahib], *Chron.*, p.138; *Menologium copto-arabicum*, in Nau (1913), pp.186, 223; *Synax. Alex.*, p.4; Sawirus, *Hist.*, III/1, pp.5-7

literature Taher (1979)

catalogues d. Bonito (1691); Sieberg (1932a); *Ambraseys *et al.* (1994)

On 31 August 1111, there was a strong earthquake in Lower Egypt, probably causing buildings to collapse in Cairo. It gave the vizier al-Afdal an opportunity to settle a dispute with the Christian community in Cairo regarding the use of land on the island of Gazira (Ar-Rudah), near Cairo.

On it stood the church of St.Michael, and next to the church were some walled gardens belonging to the vizier. On the night following the earthquake, a group of workmen led by Yusuf al-Mustahab al-Muslimani, who had built the gardens of ar-Rudah, demolished the church of St.Michael to release space for the vizier's garden, and the latter subsequently maintained that the destruction of the church had been brought about by the earthquake.

The only source for the earthquake of 1111 in which al-Afdal's version of events is accepted is the *Synaxarium Alexandrinum*, whereas all the other sources state that the earthquake was simply a pretext for the demolition of the church.

The earthquake presents some dating problems, since there are substantial differences between one source and another. Al-Makin b. al 'Amin, an Arab historian from Cairo (1205-1273), records that the earthquake occurred in the year 828 of Martyrs (one of the principal dating styles used by the Copts), on Friday 3 *Tuth*, corresponding to 31 August 1111, whereas Pseudo-Butrus al-Rahib (13th century), the Coptic author of a chronicle in Arabic, gives the date as 3 *Tuth* 818 (1101), and states that the earthquake occurred during the patriarchate of Macarius II. About a century later, the Copto-Arabic menology records, at the date given by Pseudo-Butrus, that it was the patriarch Dionysus who was at a council in Alexandria when an earthquake struck Egypt. And finally, the day of the week and the month given by Sawirus ibn al-Muqaffa', a reliable 14th century Coptic source, are the same as those given in the Arabic work of al-Makin (Friday 3), but the year of the earthquake is given as 818 of Martyrs, as in Pseudo-Butrus al-Rahib.

Of the various dates offered by the sources, the most likely seems to be that given by al-Makin. Here is what al-Makin b. al 'Amin has to say about the earthquake: "There was a violent earthquake in Egypt on Friday 3 *Tuth* in the year 828 of Martyrs at the third hour of the afternoon, and during the night the commander-in-chief of the army, al-Afdal, demolished the church at Gazira and maintained that the cause of its destruction was the earthquake".

قال و حدث حدثت بمصر زلزلة عظيمة يوم الجمعة ثالث طوبة سنة ثمان مائة وثمانية وعشرين للشهداء في الثالثة من النهار و في تلك الليلة هدم الافضل امير الجيوش كنيسة بالجزيرة وادعى ان الزلزلة هدمتها.

Pseudo-Butrus al-Rahib (13th century) states:

"(Period of the Patriarch) Macarius. In his time, in the year of Martyrs 818 [1112] on Sunday 3 *Tuth* [31 August], there was a severe earthquake. During the same night, al-Afdal the military prefect, destroyed the church "Mukhtarat on the island" which was in the middle of his garden, and announced that it (the church) had been reduced to ruins by the earthquake".

Sawirus ibn al-Muqaffa', on the other hand, concentrates almost exclusively on the affair of the destruction of the church of St. Michael.

And finally, the *Synaxarium Alexandrinum* tells us:

"In this year there was a violent earthquake in the city of Cairo and the Egyptian area. It occurred at the third hour of the afternoon and many buildings were destroyed, including the church of St. Michael the majestic, king of the angels which was at Gazira near Cairo".

وفيه ايضا تحدثت حدثت زلزلة عظيمة بمدينة مصر والقاهرة واكثر البلاد المصرية وكان ذلك في الساعة الثالثة من النهار وانهدمت منها اماكن كثيرة ومن جعلتها انهدمت كنيسة كانت بالجزيرة التي بظاهر مصر على اسم الملك الجليل رئيس الملائكة ميخائيل.

▲ 1111 08 31 6:30 UT

localities	lat.	long.	I
Cairo	30 03	31 15	VII-VIII?

< 049 > **1112 June 20 Near Naples - Tyrrhenian Sea** ▷ tsunami ◁

source 1 *Ann. Benev.*, pp.154-5

literature Guidoboni and Comastri [1994]; comets: Yeomans (1991)

catalogues d. Capocci (1861-63); Mercalli (1883)

catalogues 'fa Caputo and Faita (1984); Bedosti and Caputo (1986); Tinti and Maramai (1996); Soloviev *et al.* (2000); Tinti (2004)

This is one of the rare Italian cases of a tsunami effect being mentioned without reference to an earthquake. It has been known to the tsunami catalogue tradition from Capocci (1861-63, p.339) to Tinti (2004), and is described in a single contemporary source, the *Annales Beneventani*: the sea receded two hundred *passus* (c.300 metres) several times in the Bay of Naples. The report is linked to that of the appearance of a "very bright star". These annals were compiled in the monastery of S.Sofia at Benevento, and are a valuable source for the history of southern Italy in the 9th-12th centuries.

The three different redactions of the *Annales* which have survived date respectively to 1113-1118, 1119, and 1099-1118, and they all depend on a common source, now lost.

In version A.1. we read: "In 1112, in the fifth indiction, on the twelfth day before the Calends of July [20 June] the sea near Naples receded three or four times to a distance

of almost two hundred *passus*, with the result that fish were left on dry land, and a very bright star also subsequently appeared”.

.MCXII. .V. [...] .XII. kalendas iulii apud Neapolim mare recessit ter et quater quasi passus ducentos, ita ut pisces remanerent in sicco. postmodum autem apparuit stella clarissima.

In version A.2. we read:

“In 1112, in the fifth indiction [...] near Naples, the sea receded two hundred *passus* and fish were left on dry land. A very bright star suddenly appeared on the twelfth day before the Calends of July [20 June]”.

.MCXII. .V. [...] .mare apud Neapolim recessit quasi passus .CC. pisces in sicco remanserunt. stella clarissima statim apparuit .XII. kalendas iulii.

The star referred to in the *Annales Beneventani* may perhaps be the comet seen by Chinese astronomers on 15 August 1113 (Yeomans 1991, p.394), but it could also have been a supernova. The third redaction of the *Annales* does not record information about this tsunami.

< 050 > 1114 August 10 Jerusalem and Palestine?

source 1 Fulk Chart., *Hist.*, p.428

sources 2 *Estoire de Jerus. et d'Ant.*, p.645; Lis. Tours, *Ad secund.*, p.571

historiography Röhricht (1898)

catalogues d. Mallet (1853); *Ben-Menahem (1979); Amiran *et al.* (1994)

On 10 August 1114, an earthquake was felt in the region of the crusader kingdom of Jerusalem (which, in 1114, included some territory in Palestine).

There is evidence that an earthquake was felt, but its exact location is unknown.

The principal source is the Latin chronicler Fulk of Chartres, but although he personally experienced the earthquake, he does not explicitly describe its strongest effects, simply mentioning it immediately after recording a plague of locusts which had devastated the territory of Jerusalem (where Fulk lived) during the preceding April and May, and immediately before describing the destructive earthquake of 13 November of that year (see the next entry), which caused serious damage in an area corresponding to present-day northern Syria and central and southern Turkey.

It seems reasonable to suggest that the earthquake of 10 August 1114 was felt in the same area as that of the following 13 November.

This is what Fulk has to say:

“1114. A plague of locusts poured out of Arabia into the territory of Jerusalem and devastated the cultivated fields for many days during the months of April and May. Then, on the feast of St. Lawrence [10 August], there was an earthquake”.

Anno millesimo centesimo decimo quarto, multitudo locustarum infinita ebullit, a parte Arabiae advolans in terram Iherosolymitanam, quae per dies aliquantos segetes, mense Aprili et Maio, multum vastaverunt. Die deinde festo sancti Laurentii, terrae motus factus est.

Some 12th century Christian sources, which depend to a considerable degree on the text of Fulk of Chartres, so misread his work that their information about this earthquake on the feast of St. Lawrence is distorted. Thus, in the anonymous *Estoire de Jerusalem et d'Antioche*, the damage effects which Fulk attributes to the earthquake of 13 November are transferred to that of 10 August, while the chronicler Lisiard of Tours confuses the two events by recording a single earthquake which is supposed to have begun in April and May 1114.

localities	lat.	long.	I
Jerusalem	31 46	35 14	F

< 051 > **1114 November 13 Maresia [southern Turkey] ▷ fissures <**

- sources 1 Fulk Chart., *Hist.*, pp.428-9; Walt. Chanc., *Bella*, p.84; Anselm Gembl., *Contin.*, p.376; Will. Tyre, *Chron.*, p.23; Mich. Syr., 15.11, *Chron.*, IV, pp.594-5; *Chron. ad 1234*, p.78; Matth. Edess., *Chron.*, pp.221-3, 226; Ibn al-Jawzi, *al-Muntazam*, IX, pp.180-1; Ibn al-Qalanisi, *Dhayl*, p.191
- sources 2 *Estoire de Jerus. et d'Ant.*, p.645; Lis. Tours, *Ad Secund.*, p.573; Accolti, *Hist.*, p.617; Ibn al-Athir, *al-Kamil*, X, p.356; Ibn Kathir, *al-Bidaya*, XII, p.178; Sam. An., *Comp.*, p.122; Smbat, *Ann.*, p.143; Vard. Ar., *Hist.*, p.67; Vinc. Beauv., *Spec. hist.* p.1063a; Sicard, *Cron.*, col.591; Milioli, *Liber*, p.634; Sanudo "Elder", *Liber*, III, 6, p.3; Dandolo, *Chron.*, p.230; Sanudo, *Vitae*, col.484; Rob. Torig., *Chron.*, p.484; Romuald Sal., *Chron.*, p.207
- historiography Röhricht (1898); Kostaneanc' (1902); Segal (1970); Ducellier (1980); Yeomans (1991)
- literature Abich (1882); Taher (1979)
- catalogues d. von Hoff (1840); Perrey (1850); Mallet (1853); Sieberg (1932a); Grumel (1958); Step'anyan (1964); Zeyt'unyan (1991)
- catalogues p. Ergin *et al.* (1967); Poirier and Taher (1980); al-Hakcem (1988)

On 13 November 1114, there was a destructive earthquake in the region comprising present-day northern Syria and central and southern Turkey.

The damage zone stretched from the towns on the Gulf of Iskenderun (Mamistra, present day Yakapinar, and Antioch) in the west, to the territory of Edessa (present-day Urfa; called Al-Ruha in Arab sources) in the east, and from the castle of Mansur (present-day Adiyaman, in Anatolia) in the north to the fortress of Balis (Maskanah, to the east of Aleppo) in the south.

Some places in present-day Turkish territory suffered total collapse, including the fortified town of Mariscum or Maresia (in Latin sources, Mar'ash in Syriac sources, present day Maras) and the fortresses of Mansur (present day Adiyaman), where it is reported to have collapsed) and the ancient fortress of Trihalet (present day Akçakoyunlu), as well as many other fortresses referred to but not identified in the sources.

Very serious damage, with collapses affecting a large part of the built-up area, is recorded in the sources for 5 more specific localities: in the ancient Syrian fortress of Balis (present day Maskanah), to the east of Aleppo, about a hundred houses and half the citadel collapsed; part of Mamistra (in Turkey; present day Yakapinar) was razed to the ground; at Harran (now in Turkish territory near the border with Syria), many houses and part of the citadel walls collapsed; at Antioch, the earthquake itself, together with some associated fissures, caused a number of houses to collapse; and there were some collapses at Samosata (called Sumaysat in the Arabic sources, present day Samsat).

The sources also record that 13 towers collapsed in the city walls at Edessa (called Al-Ruha in the Arabic sources, present day Urfa), and two Christian churches collapsed at Keysun (Cakirhuyuk).

Detailed and complementary information about this destructive earthquake appears in Latin, Syriac and Arabic sources. Thus, the Latin sources record seismic effects in the territories occupied by the crusaders (the Antioch and Edessa regions); the Syriac sources record effects in the territory of Edessa only; and the Arabic sources also record earthquake damage in the emirate of Aleppo.

In addition, the earthquake is reported briefly in some Armenian chronicles, including one which is contemporary with Matthew of Edessa.

The principal source for the earthquake is the chronicle of Fulk of Chartres. He witnessed the earthquake himself, and after recording an earlier earthquake on 10 August 1114 (see the previous entry), he writes:

"1114. [...] Immediately afterwards, that is to say on the Ides of November [13 November], an earthquake at Mamistra razed part of the town to the ground. The earthquake was even more violent in the region of Antioch, to the extent that walls and houses were totally or partially destroyed in many towns; and some of the inhabitants were also crushed in the ruins. It is said that the earthquake shock was so severe at the town of Mariscum, which stands, I think, about sixty miles to the north of Antioch, that houses and town walls were completely destroyed, and all the inhabitants were killed. What a tragedy!

Another town, called Trihalet, which is situated by the river Euphrates, was also completely destroyed".

Anno millesimo centesimo decimo quarto [...]. Tempore autem sequenti, quod accidit idus Novembris, apud urbem Mamistriam terrae motus partem subruit oppidi. Item major et inauditus regionem Antiochenam adeo per loca concussit, ut oppida plurima sive tota, sive dimidia, tam domos quam muralia solo tenus subrueret, in qua etiam ruina pars plebis suffocatae interiret. Mariscum dicunt civitatem ab Antiochia sexaginta, ut aestimo, distantem milliariis, in parte septentrionali, subvertit in tantum commotio illa; ut domos et muralia penitus corruerent, et populum inhabitantem, proh dolor! cunctum exstingeret. Aliud quoque oppidum, quod Trialet nuncupant, prope fluvium Eufraten nihilominus subruit.

William of Tyre, a reliable Latin historian who was born in Syria around 1130, provides a very detailed account of the earthquake, but fails to indicate the exact date of its occurrence, simply giving the year:

"In the year of the Incarnation of the Lord one thousand one hundred and fourteen, so great an earthquake shook the whole of Syria, that many towns and fortified settlements were razed to the ground, and major damage occurred in Cilicia, Isauria and Coelesyria.

For in Cilicia the town of Mamistra was razed to the ground, together with many fortified settlements. Maresia and all its territory were also struck, to the extent that it was scarcely possible to see anything left: towers and walls were violently shaken by the shocks, and as the bigger buildings crashed to the ground, they killed a great many inhabitants. Great cities were reduced to piles of debris, which became tombs for those inhabitants who were crushed beneath them.

People fled in dismay from the towns, fearing that their homes would collapse; and while they hoped to find safety by remaining in the open, they woke from their sleep in terror, tormented in their dreams by visions of the dangers which they tried to avoid when they were awake. Nor was the disaster confined to one region, for it had spread to the most distant parts of the Orient".

Anno ab incarnatione Domini millesimo centesimo decimo quarto, tantus universam Syriam terrae motus concussit, ut multas urbes et oppida infinita dirueret funditus; maxime autem circa Ciliciam, Isauriam et Coelesyriam.

Nam in Cilicia Mamistram cum multis oppidis solo tenus prostravit; Maresiam quoque dejecit cum suburbanis suis, ita ut quorundam vix etiam exstarent vestigia: qualiebantur turres et moenia, majoribusque aedificiis periculosis ruentibus, fiebat populorum strages infinita; et civitates amplissimae quasi agger lapidum constitutae, tumulus erant oppressorum, et contritis habitatoribus vicem praestabant sepulchri.

Fugiebat plebs mente costernata habitationem urbium, domiciliorum ruinam

formidantes: et dum sub dio requiem invenire sperant, timore concussi, somnos interrumpunt, oppressiones quas vigilantes timuerant, in somnis perpassi. Nec erat hoc, tam ingens, in una tantum regione, periculum: sed usque ad extremos Orientis fines, haec pestis late se diffuderat.

The contemporary chronicler Walter the Chancellor records that after the strong earthquake of 29 November 1115 (see the next entry), survivors at Antioch were panic-stricken at the thought of the destruction caused by the previous earthquake of 13 November 1114:

"Not long afterwards, terror [at Antioch] was much increased by the memory that the town of Mamistra had been largely destroyed and its inhabitants killed on the previous feast of St. Brice [13 November 1114]."

Nec multo post recordatio oppidi Mamistrae, cum oppidanis et maiore parte civitatis in festo sancti Bricii antea pessumdati, metum multiplicat.

Another contemporary, Abbot Anselm of Gembloux (Belgium), who continued the authoritative *Chronica Monasterii Gemblacensis*, records the effects of the earthquake of 13 November 1114 at Antioch, but places the information under the year 1115:

"1115. On the Ides of November, during the night, the earth opened in the suburbs of Antioch, swallowing up many towers and the houses next to them together with their inhabitants. Some, as is the custom with those people, had gone away from those places with their wives and children; but on the way back the earthquake swallowed them up where they were".

1115. Idibus novembris in suburbio Antiochiae terra noctu dehiscens, turres multas et adiacentes domos, cum habitatoribus absorbit. Quidam autem, ut est illud hominum genus, cum uxore et filiis de locis illis migraverat; sed in redeundo positum idem terraemotus absorbit in loco quo erat.

The anonymous author of the chronicle *Estoire de Jerusalem et d'Antioche* attributed the effects of this earthquake, of which he had learned from Fulk of Chartres, to the previous earthquake of 10 August 1114 (see the preceding entry):

"1114. Then we had a plague of locusts from the region of Arabia which destroyed all our corn and gardens. On the feast of St. Lawrence there was an earthquake, and all the towns and settlements along the coast collapsed, thereby killing the inhabitants. The towns of Maras and Trihalet collapsed in ruins".

MCXIII. Puis nos vint tant grant planté d'aosteroles des contrees d'Airabe, qui tot nos gasterent blez et gardins. A feste saint Loraint, nos vint terre mote, et fundirent tote la marine citez et chastiaus, et deunc la gent morut; la cité de Mareis et Trichalet fundirent.

Although the chronicler Lisiard of Tours derives his information from Fulk of Chartres, he fails to take account of the exact chronological sequence of events in 1114 provided by Fulk (a plague of locusts in April and May, an earthquake without damage on 10 August in the Jerusalem area, and a destructive earthquake on 13 November in the Antioch region), and conflates the two separate earthquakes of 10 August and 13 November 1114, recording a single earthquake which supposedly began in the April-May period:

"1114. After the arrival from Arabia of an infinite multitude of locusts, the territory of Jerusalem suffered violent devastation for a number of days, for in April and May and subsequently it was dreadfully shaken in an earthquake. A large part of the town of Mamistra was destroyed; in the region of Antioch, many fortified settlements were completely or partially razed to the ground and some of their inhabitants killed; and similarly, in the town called Mariscum, all the inhabitants were buried in the sudden collapse of buildings, and, alas, they all suffered a terrible and wretched

death. And in the region of the Euphrates, the fortress of Trihalet was also razed to the ground".

Anno .M.C.XIV, et prius locustarum multitudine infinita ex Arabiae partibus convolante, terrorium Jerosolimitanum per dies aliquot vehementer vastatum; mense Aprili vel Maio et sequenti terrae motu horribiliter concussum; Mamistriae urbis pars nonnulla subversa; in regione quoque Antiochena plurima oppida, quaedam media, quaedam ex integro, solo tenus cum parte plebis subruta; itemque in urbe quam Mariscum noncupant, populus universus repentinis aedificiorum ruinis praefocatus, heu pro dolor! Terribiliter et miserabiliter extinctus; in Eufratesia etiam oppidum quod Trihalet noncupant funditus eversum.

The Venetian writer Marin Sanudo the Elder (1270-c.1343), uses William of Tyre as his source when he provides a factual if brief account of the earthquake:

"1114. The East, and Cilicia in particular, were struck by such an earthquake that the town of Mamistra and all the fortresses in the surrounding area were razed to the ground; and elsewhere, other towns were so seriously damaged that no building was left standing. And as men wandered through the fields in flight, they were afraid of being swallowed up by the earth".

M.C.XIV. Tantus terraemotus Orientem permovit, maxime in Cilicia, ut Malmistram, et in circuitu fortilitia cuncta deiceret: et alibi, civitates aliquae ita deletae sunt, ut aedium nullum remanserit vestigium. Homines quoque, per campos errantes, a terra absorberi metuentur.

In the Latin chronicles compiled in Italy in later centuries, the information provided by the earliest sources became increasingly corrupted.

Thus the Venetian writer Andrea Dandolo (1306-1354), whose sources are Marin Sanudo and Anselm of Gembloux, mistakenly thought that the information recorded in his sources referred to two different earthquakes. Consequently, Dandolo provides two separate reports, both of which really refer to the earthquake of 13 November 1114:

"Then the East was shaken by so tremendous an earthquake that it completely destroyed buildings especially in Cilicia, at Malmistra, and all the fortresses in the surrounding area, and in some places nothing was left standing. Men wandered through the fields fearing that they would be swallowed up by the earth.

During the night of the Ides of November [13 November], in the suburbs of Antioch, the earth swallowed up many towers and the houses beside them, together with their inhabitants".

Tunc tantus teremotus Orientem concusit, ut Cilicia maxime, ut Malmistra et cuncta fortilitia in circuitu deiceret et alicubi etiam aedium nullum remansit vestigium; homines quoque per agros errantes terra absorbi timebant.

In suburbano Antiochie, ydibus novembris, terra nocte turres plures et adiacentes domos, cum habitatoribus absorbit.

The report of the earthquake provided by Accolti (1415-1464), a historian and jurist from Arezzo, is also confused. He mentions the earthquake briefly in his *Historia Gotefridi*, together with other historical and natural events which occurred in various different years. Thus he firstly records a passing comet and what may have been *auro-ra borealis* (in May 1114, a comet with a long tail was indeed visible in Europe for a number of nights); then he mentions the capture of Tripoli (1109), Beirut (1110) and Sidon (1111) by king Baldwin of Jerusalem (1110-1118), and finally the death of princes Bohemond (1111) and Tancred (1112):

"At that time, a comet with a great fiery mane appeared in the sky, and from the first to the third hour, two suns could be seen in the sky with a rainbow in between.

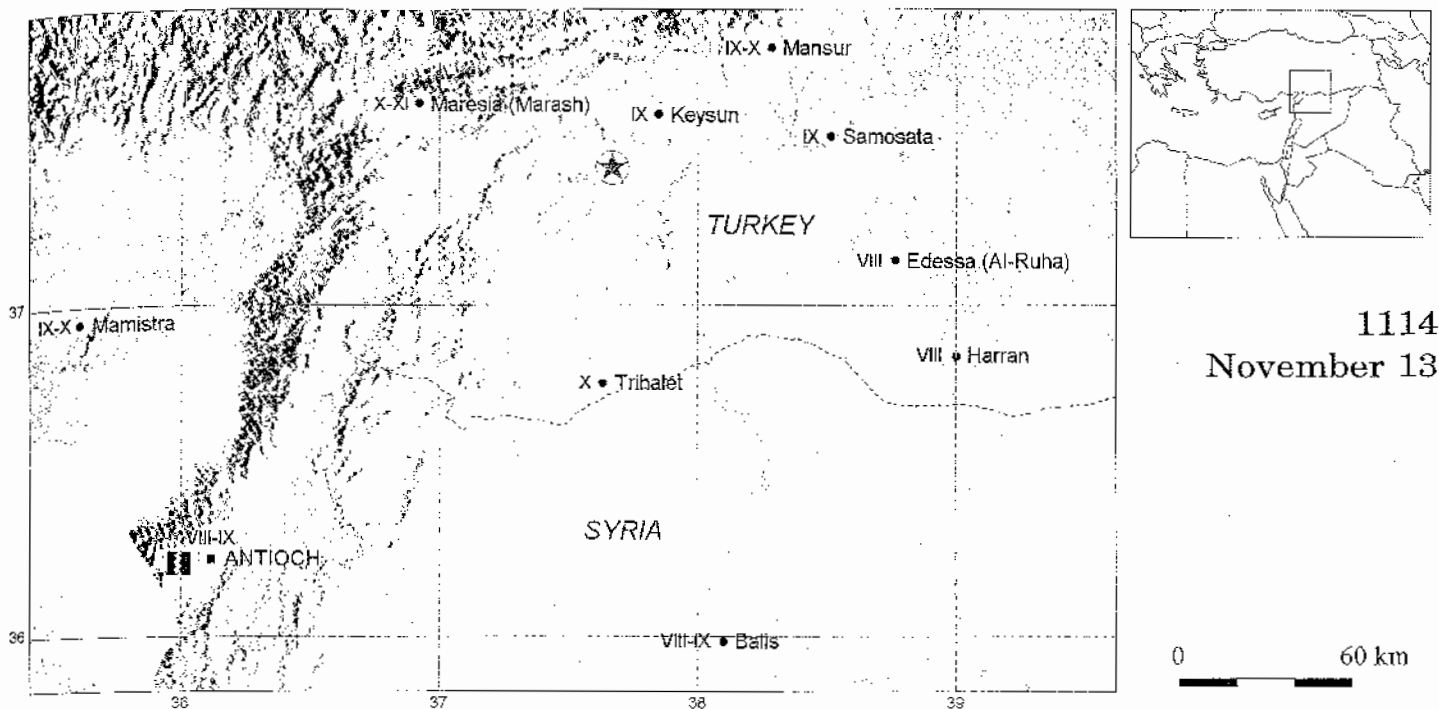


fig. 7

actually happened on 13 November 1114. Arabic sources complete the picture of the earthquake's effects, by providing precise details concerning not only the territory of Edessa, but also — unlike the Latin and Syriac sources — the emirate of Aleppo.

The principal Arabic source is the work of the contemporary Baghdad historian Ibn al-Jawzi (1116-1200), whose record contains a minor dating mistake (20 instead of 13 November):

"I have seen a text by our master Ibn Abi Bakr ibn 'Abd al-Baqi al-Bazzaz, which stated: "On Thursday 17 *Rajab* in the year 508, a letter reached Baghdad in which it was written that on the night of Sunday 18 *Jumada II* in the same year [20 November 1114], there had been an earthquake at Al-Ruha, and 13 towers in the city walls had collapsed. Part of the walls at Harran had also collapsed, and many houses had collapsed on top of their inhabitants. There had been collapses at Sumaysat; at Balis, about a hundred houses have been destroyed, and half of the citadel has collapsed, but the other half has survived".

رأيت بخط شيخنا أبي بكر بن عبد الباقي البزاز قال: ورد إلى بغداد في يوم الخميس سابع عشر رجب من سنة ثمان وخمسمائة كتاب فيه أنه كانت في ليلة الأحد ثامن عشر من جمادى الآخرة من هذه السنة زلزلة حدثت فوق منها في مدينة الرها من سورها ثلاث عشر برجاً ووقع بعض سور حران و وقعت دور كثيرة على عالم فهلكوا وأن خسف بسنيساط وخسف بموضع وتساقط في بالس نحو مائة دار وقلب بنصف القلعة وسلم نصفها.

There is a brief reference to the earthquake in Ibn al-Qalanisi (12th century):

"In that year [508 H.], there was a strong earthquake in Syria which caused both the earth and the hearts of its inhabitants to tremble".

في هذه السنة حدثت بالشام زلزلة عظيمة ارتجفت لها الأرض واشفق الناس وسكنت فسكنت لها النفوس بعد الوجيب والقلق وقرت القلوب بعد الانزعاج والفرق.

Ibn al-Athir (1160-1233), repeats the same information as that provided by Ibn al-Jawzi:

"In the month of *Jumada II* [508 H. = November 1114], there was a violent earthquake

in the regions of Gazira and Syria as well as other regions. Ruha, Harran, Sumaysat, Balis and other towns were largely destroyed, and many people died in the ruins”.

في هذه السنة في جمادى الاخرة كانت زلزلة شديدة بديار الجزيرة والشام وغيرها
فخرت كثيرا من الرها وحران وسيساط وبالس وغيرها وهلك خلق كثير تحت الهدم.

There is a later record of the earthquake in Ibn Kathir (1300-1373), who writes that: “In the Khurasan, a few houses were destroyed, and a good many dwellings were destroyed in many other villages. About 100,000 people died, and half the citadel at Harran collapsed, but the other half remained standing. The town of Sumaysat [present-day Samsat] also collapsed. Many people died in the ruins”.

بأنها هدمت بعض دور خراسان ودورا كثيرة في بلاد شتى فهلك من أهلها نحو مائة
ألف وأنه خسف بنصف قلعة حران وسلم نصفها وخسف بمدينة سيساط وهلك تحت
الردم خلق كثير.

▲ 1114 11 13		⊗ = 37 24 37 40		$I_0 = X$	$M_e = 6.3$	Sites: 11	EE: 1
localities	lat.	long.	I	localities	lat.	long.	I
Maras TR	37 36	36 55	X-XI	Antioch TR	36 14	36 07	VIII-IX,FE
Akçakoyunlu TR	36 46	37 38	X	Maskanah SYR	35 59	38 06	VIII-IX
Yakapinar TR	36 57	35 36	IX-X	Urfa TR	37 08	38 46	VIII
Adiyaman TR	37 46	38 17	IX-X	Harran TR	36 51	39 23	VIII
Cakirhuyuk TR	37 34	37 51	IX	Jerusalem	31 46	35 14	F
Samsat TR	37 30	38 31	IX				

< 052 > 1115 November 29 Mamistra [southern Turkey]

sources 1	Walt. Chanc., <i>Bella</i> , pp.83-84; Fulk Chart., <i>Hist.</i> , p.431; Lis. Tours, <i>Ad Secund.</i> , p.573
sources 2	Romuald Sal., <i>Chron.</i> , p.207; <i>Liber Pontific.</i> , p.301; Sicard, <i>Cron.</i> , p.591; Milioli, <i>Liber</i> , p.634
literature	Ambraseys and Jackson (1998)
catalogues	Bonito (1691); von Hoff (1840); Perrey (1850); Mallet (1853); Grumel (1958); Amiran <i>et al.</i> (1994)

On 29 November 1115, there was a strong earthquake in the area of the Gulf of Iskenderun and its hinterland, with damage stretching as far north as Maresia (present day Maras, in Turkey) and probably as far east as Cerepum (present day Al-Atarib, in Syria). At Maresia (Maras) and Mamistra (Yakapinar), which had already been devastated in the earthquake of 13 November 1114 (see the previous entry), the built-up area collapsed completely; at Antioch (Antakya), where the earthquake of the previous year had caused some houses to collapse, there were widespread total collapses involving monumental as well as private buildings. There was probably damage at Cerepum (Al-Atarib) as well. Fresh shocks continued at Antioch for about another 5 months, but urged on by the Christian patriarch, the local population rapidly set about restoring an ordered urban existence after the disaster. Those inhabitants who were camping outside the city were brought back; aid was distributed to orphans and widows, and provision was made to care for the poor.

The principal source for the earthquake is Walter the Chancellor, who personally experienced it at Antioch. Of all the historians' narratives of the crusaders' earliest decades in the Holy Land, his report is undoubtedly the most detailed description of an earthquake:

“In the one thousand one hundred and fifteenth year since the birth of Our Lord Jesus Christ, on the eve of the feast of St. Andrew the Apostle [29 November], deep in the silence of the night, when human frailty can most sweetly enjoy the calm of sleep, an immense and terrible earthquake struck the city of Antioch and its territory. Men are

taken by surprise. They feel, see and hear that they and others are in danger from collapsing walls, towers and other buildings; and so they leap down from the fortifications and even throw themselves from tall houses. Many, however, are taken by surprise in their sleep, and are crushed in their collapsing homes, so that although some walls of their houses remained standing, they were never found. Others abandoned their homes and all their possessions and belongings in terror, and wandered through the streets and squares of the city in a daze. And as all were torn between fear and a sense of impotence, they raised their hands to heaven, and each in his own tongue cried out incessantly with tearful voice: 'O Lord, have mercy on your people!' When morning came, and it was clear what slaughter of men and animals was concealed beneath the ruins, everyone together, whether Greeks, Latins, Syrians, Armenians, strangers or pilgrims, agreed that what had happened was a result of their sins. [...] When church services had been held, the sermon delivered and men had decided where to go and what to do [the Antiochenes] who thought that nothing worse could happen to them, were suddenly horrified by a terrible piece of news. For some people, who by the grace of God had escaped the destruction of the town of Maresia, told how that town had been razed to the ground [by the earthquake] and its lord and bishop with all his clergy and the whole population had met their deaths. And shortly afterwards, their terror was increased by the memory of what had happened at the town of Mamistra, where, on the feast of St. Brice in the previous year [13 November 1114], the townspeople and most of the town itself had been swept away in the disaster. And what could have happened to the town of Cerepum? And what to the rest of the Antioch region? Everyone felt a torment of this kind. This mixture of fear and apprehension so increased in the wretched population [of the town] that no-one knew whether to stay or flee. Fear of an earthquake so weighed upon these wretches every day and at any time that they all said to one another: 'Oh cursed fate to be born, unhappy fate to die, and intolerable fate to be alive!'. Although they had all seen that there is no place or way to avoid the power of God, yet they preferred to live in the open with the animals rather than suffer the continual fear that the buildings in which they found themselves would collapse. And so they abandoned their homes and went to live in the streets, squares, gardens and thickets, using tents as homes. Yet others left the towns and travelled from place to place with their makeshift camps.

But the patriarch, who was a man capable of dealing with the situation and all eventualities, by calling upon all the resources of his wisdom, managed to soothe the hearts of the stricken and of those who had no further hope in life, succouring them with the sweetness of holy preaching [...]. Those who had fled were called back, sinners were led back to the path of righteousness, comfort was given to orphans and widows, by providing what was necessary in their indigence. Efforts were made, with suitable help and joyous countenance, to restore the bodily health of the poor, the sick and the indigent, and to cheer those who had already recovered. What more needs to be said? Men were reformed through penitence, ennobled by good works, and freed from the fear of the earthquake, though it continued to threaten them for more than five months, not by their own merits but by the will of God; and so they joyfully gave thanks to the Omnipotent in His church".

I—Anno igitur millesimo centesimo quinto decimo ab Incarnatione Domini nostri Iesu Christi, in vigilia festivitatis beati Andreae apostoli, sub intempestate noctis silentio, qua humana fragilitas habilis atque dulcius quiescere consuevit, factus est terraemotus in Antiochiam et eius partes immensus et orribilis. Ipso etenim ex insperato homines terribiliter pulsati, sentiunt, vident, audiunt murorum, turrium, aedificiorumque diversorum ruinam sibi ac caeteris penitus imminere; quam nonnulli fugiendo putantes evadere, quidam elapsi a moenibus, quidam ab altis domibus in praecipitium se dedere. Plures equidem in somno cum ruina membratim ita sunt rapti,

quod, manente etiam parte parietis integra, nusquam comparuere. Alii vero terrore percussi, dimissis domibus, spreto opibus, relictis omnibus, per plateas et vicos civitatis velut amentes se agebant. Expansis tamen ad coelum manibus, pro diversitate metus et impotentiae, pro diverso linguarum genere, voce lacrimabili: 'Parce, Domine, parce populo tuo!' clamare non cessabant.

II – Mane autem facto, cum sub ruina tam hominum quam et aliorum animalium miserae cladis pateret immanitas, omnes unanimiter Latini, Graeci, Syri, Armeni, advenae et peregrini, suis peccatibus exigentibus id accidisse profitentur [...].

III – Celebrato vero divino officio, facto sermone, iniunctisque mandatis quo modo se habeant, vel quid agere debeant, nihil gravius accidisse putantes, repente horribili terrentur nuntio. Quidam namque, a periculo ruinae oppidi Miragii divino nutu elapsi, ipsam civitatem cum eiusdem domino et episcopo, clero etiam et omni populo, funditus eversam fuisse protestantur. Nec multo post recordatio oppidi Mamistrae, cum oppidanis et maiore parte civitatis in festo sancti Bricii antea pessumdati, metum multiplicat. Quid de Cerepo? Quid de ceteris Antiochenis finibus? Par tormentum predicatur de disparibus. Metus ergo timori permixtus ita miserae plebi ingeminatur, quod ubi maneant aut quo fugiant prorsus ignorant. Quaque enim die, horis, desperatis instabat terraemotus; unde ad invicem haec pronuntiant: 'O necessitas abiecta nascendi, misera moriendi, dura vivendi nostra necessitas!' Hi, licet noverint Dei potentia nusquam et numquam posse aufugi, eligunt tamen facilius esse cohabitare cum bestiis extra, quam intus incessanter aedificia timere ruitura. Quocirca in vicis, in plateis, in hortis, in virgultis, desertis habitationibus aliis, tentoribus pro domibus potiebantur. Plures etiam, relictis civitatibus, de loco ad locum translatis mapalibus, in campis morabantur.

IV – Atqui patriarcha, loci, temporis, omnium peritissimus, per necessaria disciplinarum philosophiae membra discurrens, desolatorum et iam fere de vita desperantium corda, sanctae predicationis dulcedine fota, mitigavit. [...] Dispersos revocant, devios corrigunt, orphanis, visuis ferre solatium, et eorum indigentiam supplere satagunt. Sufficiens etiam hospitalitate, pauperum, inopum et indigentium corpora vultu hilari nituntur recreare, ac recreata datis muneribus exhilarare. Quid ultra? Fructu poenitentiae correcti, bonis operibus adornati, a periculo terrae motus per quinque menses et ultra imminenti, non suis meritis, sed Dei gratia liberati, Cunctipotenti referunt gratiarum actiones in ecclesia sua laeti.

Fulk of Chartres has a very brief report of the earthquake:

"1115. [...] In that same year, the town of Mamistra was again reduced to ruins by an earthquake. Nor was it felt less strongly in other towns in the region of Antioch".

Anno millesimo centesimo decimo quinto. [...] Ipso anno iterum subversa est urbs Mamistria terrae motu. Alias autem in regione Antiochena non minus accidit.

Lisiard of Tours also mentions it briefly:

"1115. [...] Indeed, just as [God] in his love protected men, so he also called them unto himself with implacable justice, [as he showed] that same year by destroying with an earthquake the formerly quite illustrious town of Mamistra, and also by striking many other places in the region of Antioch with a similar disaster".

Anno .M.C.XV. [...] Verum quos ita Deus per se protegebat pius, per se quoque ipse corripiebat justus, eodem anno et Mamistriam terrae motu subvertens, urbem olim satis illustrem, et pleraque alia in territorio Antiocheno loca horrore simili concutiens.

Secondary Latin sources tend to give wrong dates for this earthquake and, in particular, to confuse it with the previous destructive earthquake of 13 November 1114, whose damage zone becomes partly superimposed on that of the earthquake of 29 November 1115. Archbishop Romuald of Salerno (1120/1130–1181), for example, confuses information about the 1114 earthquakes (see the preceding entries) and that of 29

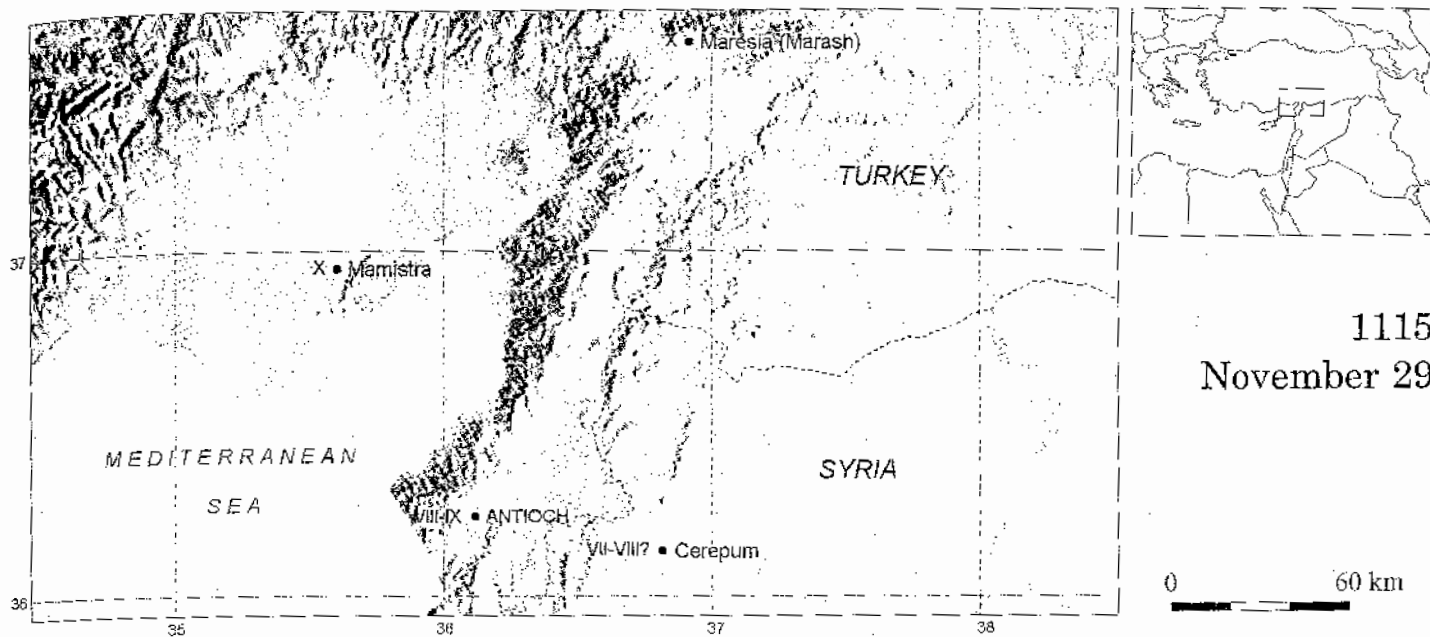


fig. 8

November 1115, making the following entry for December 1115:

"In the month of December in that same year, before Christmas, there was so great an earthquake in Syria that Mamistra and Maras and many other towns and villages were razed to the ground, crushing men in the ruins; and part of Antioch and even of Jerusalem collapsed to the ground".

Eodem anno mense Decembris in Siria ante Natalem Domini terre motus ita fuit magnus, quod Mamistra et Marais ad solum usque et alie quam plures civitates et castella, attritis hominibus, set et pars civitatis Antiochiaie ac usque Jerusalem prostrate ceciderunt.

The *Liber Pontificalis* similarly attributes some of the damage caused by the earthquake of 13 November 1114 to that of 1115. For while the complete collapse of Mamistra did indeed occur on 29 November 1115, the surface faulting at Antioch was in fact caused by the previous earthquake:

"Here are the prodigies which occurred at that time: an earthquake destroyed all the town walls and houses at Mamistra; and most of the inhabitants were caught up in the disaster. One knight, for example, who was trying to flee to Antioch, was swallowed up by the earth together with his horse when a fissure suddenly appeared, so that he was buried alive.

And on that same occasion, an ox was caught in another crack in the earth, and while its body disappeared into the abyss, its horns remained attached to the surface".

Huius temporibus prodigia. Apud Mamistram terremotus muros omnes domosque subvertit; maiorem hominum partem ruina involvit, quam dum miles quidam fugere nititur ad Antiochiam properans, subito hiatu terrae cum equo absorptus, prius est sepultus quam mortuus. Ibidem, alio hiatu terrae bos interceptus, dum corpore inferius fluxit cornibus superius hesit.

▲ 1115 11 29 ☉ = 37 17 36 16 I₀ = X Me = 6.3 Sites: 5

localities	lat.	long.	I	localities	lat.	long.	I
Yakapınar TR	36 57	35 36	X	Al-Atarib SYR	36 08	36 49	VII-VIII?
Maras TR	37 36	36 55	X	Jerusalem	31 46	35 14	F
Antioch TR	36 14	36 07	VIII-IX				

< 053 > 1117 January 3 night southern Germany and north-western Austria

< 054 > 1117 January 3 afternoon Verona area [northern Italy]
▷ clouding of springs, chemical changes in water, fissures, flooding of the rivers Po, obstruction of the river Adige by a landslide ◁

sources 1 Documents

Italy ASVat, *Cancellaria della Nunziatura Veneta*, S.Giorgio in Braida, 30, 1, no.6886; ASVr, *Antichi archivi comunali*, Ospitale, b.4, no.223; *Corporazioni religiose*, Congregazione del clero intrinseco, b.13, cart. no.7, fol.117; ACapPc, *Diplomatico*, Atti privati, no.606; no.751; no.752; no.1054; no.1055; no.1073; Barbieri and Cau, *Le carte del monastero di S.Pietro in Monte Ursino (1039-1200)*, docs. no.74, no.85, no.86, no.97, no.114, digital publication edited by Michele Ansani, 2000; Deed of count Abbas of Sabbioneta; Deed in favour of the cathedral of S.Pietro in Mantua, in Torelli (1924, pp.26, 28); *Memories, in Codice Diplomatico Padovano*, ed. Gloria (1879, p.68); *Italia Pontificia* (ed. Kehr 1961, vol.7/1, p.301)

Annals, Chronicles and *Notulae*

BAVat, *Vat. Lat.* 11564, fol.184, Guido Pisano, *Notula* (ed. Scalia 1963, pp.285-6); BCPd, B.P.119.1/2, Dorighello, *Cronaca di Padova*, I, fol.290; *Ann. Brix.* (cod. A), p.812; *Ann. Brix.* (cod. B), p.812; *Ann. Casinen.*, p.308; *Ann. Ceccan.*, p.282; *Ann. Cremon.*, p.3; *Ann. Ferrar.*, p.663; *Ann. Mediol. brev.*, p.390; *Ann. Mediol. brevis.*, p.391; *Ann. Mediol. min.*, p.393; *Ann. Parm. min.*, p.662; *Ann. S.Trin. Veron.*, p.2; *Ann. Venet. brev.*, p.71; *Ann. Veron. ant.*, pp.25, 31-2; *Ann. Veron. brev.*, p.2; *Ann. Veteres*, p.89; Landulf, *Hist.*, p.27; *Mem. Mediol.*, p.399; *Notae S.Georgii Mediol.*, p.388; *Notae S.Mariae Mediol.*, p.385; *Notula* in a church obituary from Monza, in Frisi (1794, vol.3, p.104); Peter Deac., *Cont.*, pp.524-5; Romuald Sal., *Chron.*, p.208; *Supplem. (Ann. Cremon.)*, p.185; *Chron. Favent.*, p.33

Europe Eimon, *Chron. (cod. August.)*, p.3; *Ann. Brunw.*, p.726; *Ann. Corb.*, p.43; *Ann. Einsidl.*, p.146; *Ann. Hildes.*, p.64; *Ann. Laub.*, p.22; *Ann. Marbac.*, p.40; *Ann. Mell.*, p.501; *Ann. Mosom.*, p.162; *Ann. Prag.*, p.120; *Ann. Ratisp.*, p.585; *Ann. Remen.*, p.732; *Ann. Roden.*, p.699; *Ann. Rosenvel.*, p.104; *Ann. S.Benign. Divion.*, p.43; *Ann. S.Blasii Sil. Nig.*, p.277; *Ann. S.Dion. Rem.*, p.83; *Ann. S.Disib.*, pp.22-3; *Ann. S.Mich. Babenb.*, p.10; *Ann. S.Pantal. Colon.*, p.751; *Ann. S.Petri Babenb.*, p.636; *Ann. S.Petri Catal.*, p.489; *Ann. S.Petri Erph. ant.*, p.6; *Ann. S.Rudb. Salis.*, p.774; *Ann. S.Steph. Frising.*, p.53; *Ann. Zwifalt.*, p.55; Anselm Gembl., *Contin.*, p.376; *Auctarium Zwettl.*, p.540; Berthold Zwief., *Chron.*, p.218; *Casus monast. Petrish.*, p.661; *Chron. Elwac.*, p.36; *Chron. rhyt. Leod.*, pp.124-6; *Chron. S.Max.*, 12, p.406; *Chron. S.Petri Erford. mod.*, pp.161-2; *Auct. Laudun.*, p.445; Cosmas Prag., *Chron.*, p.123; Ebo, *Vita*, p.838; Ekehard, *Chron.*, p.252; *Notae Halesbrun.*, p.13; Otto Freis., *Chron.*, p.330; *Peterb. Chron.*, p.144; Ralph Cogg., *Hist.*, p.344; [Raimbaud], *Itiner.*, p.2

inscriptions

directly related to the earthquake: 1. bell-tower of S.Mauro at Costozza; 2. cathedral of S.Maria Assunta in Padua; 3. abbey of S.Silvestro at Nonantola (Modena); 4. church of Ss.Faustino e Giovita, at San Faustino (Reggio Emilia); which offer indirect evidence of earthquake damage: Verona: 5-6. cloister and church of S.Zeno; 7. church of S.Fermo Maggiore; 8. church of S.Fermo Minore in Braida; 9. church of S.Maria in Organo; 10. church of S.Salvaro at San Pietro (Verona); 11. cathedral in Piacenza; 12. church of S.Maria Maggiore at Gazzo Veronese (Verona); 13-14. church of La Bastia and abbey at Isola della Scala (Verona); 15. church of S.Martino at Piove di Sacco (Padua); 16. abbey of S.Pietro Apostolo at San Bonifacio (Verona); 17. church of S.Michele (or Madonna di Stra) at Belfiore (Verona); 18. church of S.Pietro in Cantalovo at Bevilacqua (Verona)

Agazzari, *Chron.*, p.16; Albert Stadensis, *Ann.*, p.321; Albert Bez., *Cron.*, p.19; Albertus Magnus, *Meteor.*, III, 6; *Ann. Admunt.*, p.577; *Ann. Anglosax.*, p.118; *Ann. Bohem. brevis.*, p.719; *Ann. Bergom. brev.*, p.327; *Ann. brev.*, p.95; *Ann. de Southw.*, p.430; *Ann. Egmund.*, p.450; *Ann. Floreff.*, p.624; *Ann. Grad.*, p.649; *Ann. Halesb.*, p.14; *Ann. Leod.*, p.30; *Ann. Magdebur.*, p.182; *Ann. Mell. cont. Claustron. Pr.*, p.612; *Ann. Melros.*, p.434; *Ann. Palid.*, p.76; *Ann. Pegav.*, p.2; *Ann. S.Petri Erph. brev.*, p.50; *Ann. S.Petri Erph. maior.*, p.51; *Ann. Saxo.*, p.754; *Ann. Scheftl. maior.*, p.336; *Ann. Stederbur.*, p.203; *Ann. S.Trudp.*, p.290; *Ann. Vizel.*, p.225; *Ann. Wind.*, p.752*; *Brev. Chron. Mant.*, p.12; *Catal. imp.*, p.114; *Chron. abbr.*, p.325; *Chron. Esten.*, p.5; *Chron. illor.*, p.63; *Chron. Parm.*, pp.3, 4; *Chron. reg. Colon.*, p.57; Codagnello, *Ann.*, p.3; *Auct. Mortui Maris*, p.464; *Cont. Praemontr.*, p.448; *Cron. Ramp.*, II, p.7; *Cron. Varign.*, II, p.8; Dandolo, *Chron.*, p.321; Alighieri, *Comedia*, Inf. XII, 4-9; Mussi, *Chron.*, p.452; Henry Heimb., *Ann.*, p.713; Honor. Autun, *Summa*, p.131; Joh. Trithem., *Chron.*; *Magni Reiches. Chron.*, p.530; Malvezzi, *Chron.*, col.874; Marzagaia, *De mod. gest.*, p.58; Matt. Paris, *Hist.*, p.391; *Note cronogr.*, col.556; Vinc. Beauv., *Spec. hist.*, p.1063b; Paris. Cerea, *Ann.*, p.2; Rob. Torig., *Chron.*, p.485; Roger Wend., *Flor.*, p.29; Sanudo, *Le vite*, pp.173, 176; Sicard, *Cron.*, p.162; *Un prezioso rotolo*, p.53; Will. Nang., *Chron.*, p.726

historiography

Giovio (ed.1887); Scardone (1560); Locati (1564); Campo (1585); Capriolo (1585); Angeli (1591); Bonifaccio (1591); Sigonio (1591); Dalla Corte (1594); Cavacio (1606); Piloni (1607); Portenari (1623); Merula (1627); Panvinio (1648); Campi (1651); Palladio degli Olivi (1660); Vedriani (1666); Riccioli (1669); Maffei (1675); Orsato (1678); Tatti (1683); Ughelli (1717); Argelati (1745); Zagata (ed. 1745-47); Rizzoni (ed. 1747); Biancolini (1749); Muratori (1762); Poggiali (1766); Visi (1782); Sanseverini (1778); Affò (1795); Di Meo (1795); Carli (1796); Tonelli (1797); Giulini (1854-57); Moroni (1858); Odorici (1856); Cipolla (1879); Bilfinger (1892); Hofmeister (1912); Ruyschaert (1959); Scalia (1963); Mor (1964); Verzone (1968); Nasalli-Rocca (1975); Pellegri (1978); Dominici and Marcelli (1979); Cerati (1981); Golinelli (1981); Ferraris (1988); Andreolli *et al.* (1991)

architectural history

Pinton (1891); Lucchini (1894); Ricci (1895); Novati (1904); Bellodi (1905); De Vecchi (1907); Cerri (1909); Da Lisca (1909, 1912); Cerri (1913); Simeoni (1913); Da Lisca (1914); Porter (1917); Pancotti (1922); Da Lisca (1924); Simeoni (1929); Nasalli-Rocca (1933); Da Lisca (1935, 1936); Arslan (1939); Da Lisca (1941); Panazza (1942); Arslan (1943); Romanini (1951); Salmi (1952); Salvini (1954); Puerari (1955); Romanini (1956); Bressola (1957); Bresciani (1957); Paccagnini (1960); Rasmò (1961); Berro (1962); Ederle (1963); Jotti e Tarabusi (1963); Passamani (1963); Gerometta (1964); Quintavalle (1964); Romanini (1964); Tregnaghi (1964); Zovatto (1964); Vezza (1965); Berzolla and Siboni (1966); Magni (1966); Salvini (1966); Tassi (1966); Caldera (1967); De Carli (1967); Rogger (1967-75); Verzone (1967); Boschi and Martini (1968); Canali (1968); Quintavalle (1969); Ebani (1971); Montorsi (1971); Puerari (1971); Puppi (1971); Cocchetti Pratesi (1972); *La Basilica dei Santi Felice e Fortunato* (1972); Quintavalle (1973); Gandolfo (1973); Cocchetti Pratesi (1974-77); Piva (1974); Quintavalle (1974); Cocchetti Pratesi (1975); Fresta (1975); Gandolfo (1975); Lucchi and Voltini (1975); Quintavalle (1975); Boschi and Martini (1976); Cappellini (1976); Castagnetti (1976); Cocchetti Pratesi (1976); Artico (1977); Bellinati (1977); Ederle (1977); Montorsi (1977); Moreali (1977); Ongari (1977); Quintavalle (1977); Rivani (1977); Sandrini (1977); Chierici (1978); Flenghi (1978); Manenti Valli (1978); Marangoni (1978); Salvini (1978); Segagni (1978); Zuliani (1978); Brugnoli *et al.* (1979); Chiappa (1979); Chierici and Citi (1979); Lazzaretti and Ruffi (1979); Mazzetti (1979); Pezzini Frasson (1979); Quintavalle (1979); Zovatto (1979); Arisi Riccardi (1980); Artioli (1980); Carrà (1980); Gatti (1980); Cocchetti Pratesi (1980); Marchesini (1980); Piazzini (1980); Tosi (1980); Zavaglio (1980); Segagni Malacart (1981); Cademartiri (1981); D'Arcais (1981a, b); Arieti (1982); De Angelis-d'Ossat (1982); Gighi (1982); Moretti and Stopani (1982); Mussini (1982); Quintavalle (1982);

- Richeldi (1982); Sissa (1982); Peroni (1983a, b); Calzona (1984); Garuti (1984); Montorsi (1984); Serchia *et al.* (1984); Brogiolo (1990); Cecchi (1994)
- literature Guidoboni (1984); Guidoboni *et al.* [1985]; Orombelli and Sauro (1988); Guidoboni and Boschi (1989); Hülsen (1993); Guidoboni *et al.* (1997); Sauro and Zampieri (2001); Guidoboni *et al.* (2005)
- catalogues d. Manetti [1457]; Lycosthenes (1557); Ligorio [1570-74]; Ragor (1578); Filippo da Secinara (1652); Bonito (1691); Seyfart (1756); von Hoff (1840); Perrey (1845); Perrey (1847); Perrey (1848); Mallet (1853); Guarini (1880); Mercalli (1883); Piovene (1888); Tommasi (1888); Mercalli (1897); Baratta (1901); Schorn (1902); Milne (1911); Guidi (1915); Zanon (1937); Grumel (1958); Mahlknecht (1976); Alexandre (1990); *Boschi *et al.* (1995, 1997, 2000)
- catalogues p. Giorgetti and Iaccarino (1971); Carrozzo *et al.* (1973); Iaccarino and Molin (1978); Postpischl (1985); CPTI (1999)

History of the earthquake's interpretation

This famous seismic event aroused great interest in medieval Europe and became firmly embedded in the collective memory of many places, but we now know that it resulted from at least three earthquakes (Guidoboni *et al.* 2005): one was in southern Germany, another in the Verona area in northern Italy (see below), and a third in Tuscany (in the Pisa area – see the next entry). The first two shocks partly overlapped, whereas the third is easier to define. But for a very long time, this seismic sequence was considered to be a single astounding earthquake. As far as Italy is concerned, the interpretation of this seismic sequence now has its own history, which perhaps merits a brief survey. As it passed from ancient monastic annals and the earliest town chronicles to the erudite historiography of modern times, and from there to the earliest catalogues of historical earthquakes (from Manetti 1457 to Baratta 1901), uncertainty as to its location gradually increased, and it acquired increasingly vague outlines, thus becoming an extraordinary event affecting almost the whole of northern Italy.

Baratta (1901) had already felt some uncertainty in placing it in the Veneto and Lombardy regions; and when an urgent need was felt in the 1970s and early 1980s to attribute numerical parameters to historical earthquakes in order to set up the first parametric catalogues of such events, its epicentre was placed about 15 km north of Verona (Giorgetti and Iaccarino 1971; Carrozzo *et al.* 1973). It was later placed farther north: about 10 km north-east of Malcesine, close to the northern shore of Lake Garda (Postpischl 1985). These catalogues are entirely based on the work of Baratta (1901). Since this was the largest known historical earthquake in northern Italy (it was given an intensity between grades X and XI on the MCS scale), it underwent a thorough review in 1980-84, within the framework of macroseismic studies required for the safety of nuclear power stations in Italy. At that time, extensive and systematic research was carried out into documentary, annalistic and epigraphic sources, in order to establish an objective outline of the event (Guidoboni 1984; Guidoboni *et al.* 1986).

One of the factors which made this research particularly interesting from a methodological point of view was the fact that art historians — especially those concerned with the “Lombard Romanesque” style (typical of 12th century churches in northern Italy) — had turned the earthquake into a sort of “epicentreless” seismic event, with an extremely broad and largely undifferentiated damage zone. This was because changes of style and rebuilding work at churches and abbeys had led them to attribute destruction to the 1117 earthquake. Even though this explanation of changes in church and monastic building — mostly uncritical, and paying little attention to the historical context — had no direct points of contact with the very broad and confused historical and seismological traditions relating to the earthquake, it bolstered them, and made it almost impossible to disentangle the earthquake's real effects. It was thus only after research carried out in the 1980s and taken up again in the mid-1990s for the new *Catalogo dei Forti*

Terremoti in Italia (Boschi *et al.* 1995, 1997) now in its third version, *Catalogue of Strong Italian Earthquakes* (Boschi *et al.* 2000) and the catalogue of the active faults in Italy (Valensise and Pantosti 2000) that we had a reliable corpus of congruent and authoritative descriptive material, and could carry out a more accurate analysis of damage. But the problems and limitations of contemporary information also became apparent. The earthquake is listed in Alexandre's catalogue (1990), the entry being based on a review of monastic sources (but only a French translation of the original Latin texts is provided). However, in spite of a noteworthy critical apparatus concerning the dating of the sources, the relationship between the texts and the greater or lesser chronological proximity of the authors to the event, this catalogue, too, makes reference to a single earthquake with a single epicentre location.

Hülsen (1993) provides an up-to-date review of the historiographical situation concerning this large earthquake, as it was at the time of the studies published in the 1980s, analysing various contributions and examining a number of sources which had already been used in earlier studies. While the critical work is admirable, however, it is not always accompanied by an understanding of the particular problems involved in historical seismology, especially as regards medieval sources. Hülsen shows a certain amount of scepticism as to the contribution of medieval Latin sources to a seismological understanding of the earthquake. In our view, however, the corpus of sources (documents, annals and inscriptions) and architectural analyses which now underpin the overall picture of the earthquake's effects (they are only partly discussed in Hülsen 1993), are so numerous, and display such a linguistic and cognitive complexity that their value as evidence is extraordinarily great, and for that very reason they require a very particular critical approach. The most recent review of this seismic sequence was carried out in 2000-2001 for this catalogue, and it brought to light both new documents (for the Brescia and Vercelli areas) and more thorough investigations leading to the identification of three separate seismic events. This obviously meant that earlier parameters had to be amended. For the present catalogue entry we have made use of a critical review by Guidoboni *et al.* (2005), resulting in the identification of three separate events.

Aspects of the historical context

The earthquake was extremely famous, as an event of great importance for the society and culture of the time. Establishing its effects is a difficult matter, however, not only because of the very special types of documentary evidence involved, but also because the habitational context of the time was very different from that of today. The Po Plain area, which is now one of the most densely cultivated and inhabited in Italy, was typically covered by broad areas of forest and marshland in the early 12th century. Towns had small populations and contained large open spaces. But these were years when towns were enjoying widespread economic and demographic recovery, typical of which were the dynamic activities of the secular and church authorities in the reorganisation of urban structures and those of the surrounding countryside.

The economy was based on a manorial system, involving large agricultural production units which had been characteristic of the scattered small settlements outside the towns. The many newly-built churches, public buildings and town walls are evidence of increasing investment in building works, and also a sign of a more general economic development in the early decades of the 12th century. This is a very important factor in making an overall assessment of reconstruction work. But it is not the only one: for there were very influential elements of contemporary culture which cannot be ignored. The most important of these was support for religious reforms of papal or imperial inspiration, which took material shape partly in the adoption of particular architectural canons reflecting the political and religious ideas underlying the struggle between papacy and empire. Of considerable influence in the Po Plain area was the pro-papal policy of countess Matilda of Canossa, for she was at the head of the most important secular *signoria* in north-cen-

tral Italy, extending from the Mantua area to Emilia and as far as Tuscany.

We can thus attribute to Matilda and her pro-papal entourage numerous cases of reconstruction work on churches in her subject territories along lines inspired by the new Cluny model. The plan of the famous French abbey, with its single nave, apsed transept and three apses, was taken up in urban churches and the great abbeys of northern Italy, such as those of San Benedetto in Polirone (San Benedetto Po) and Nonantola. A very similar structure — at least as regards the use of the symbols reflecting the ideas of the reform movement — can be found in the cathedrals of Modena, Parma, Cremona, Reggio Emilia and Piacenza. In some of these cases, the same master craftsmen were at work, but most important of all, a single plan inspired both the sculptural decoration and the arrangement of the liturgical furnishings as a direct function of the building plan: the pulpit and rood screen raised above crypt level, for example. It is indeed the decorative work on the rood screens which makes it possible to establish fairly accurately when work was carried out in the principal urban cathedrals in countess Matilda's realm: namely between 1099, when the architect Lanfranco was summoned to Modena, and 1115, the year in which Matilda died. The period when these cathedrals, and many other churches scattered across the area, were built, must therefore be put back to the years immediately preceding 1117, as Quintavalle (1969, 1973) has rightly observed. This is a matter of considerable importance, for if we use an indirect indicator such as reconstruction work in assessing the damage caused by the earthquake, the resulting picture is thereby substantially altered.

Two partly overlapping earthquakes

As already pointed out, two earthquakes were identified from the sources, about 9-11 hours apart, the second being more violent than the first. The first occurred during the night of 2-3 January 1117 before sunrise (about 07:30 UT at that time of the year); the second and stronger earthquake occurred in the early afternoon (about 15:15 UT) on 3 January. Both earthquakes are recorded with striking precision by the sources, though obviously using contemporary chronological terms of reference, taking account of the latitude, the month and the monastic customs in the counting of the hours (Bilfinger 1892; Dominici and Marcelli 1979) (see Table at the side).

first earthquake
southern Germany
north-western Austria

Given the semantic limitations of the available documentary evidence, it is not possible to identify with accuracy the effects of either earthquake: however, it can reasonably be suggested that the first earthquake primarily affected the regions of present-day southern Germany and north-western Austria, for these are the areas referred to in sources compiled at Disibodenberg, Freising, Salzburg, Augsburg, Constance, St-Blasien, Zwiefalten and Melk as having experienced an earthquake at night, whereas no source from Italy, with the exception of Pisa (see the next entry), mentions a time in this connection. For the effects of this first earthquake, outside the Mediterranean area, see Guidoboni *et al.* (2005).

second earthquake
Verona area

The second earthquake, that is to say the one occurring in the afternoon of the 3 January 1117, affected the Verona area, especially the low-lying plain along the river Adige. There was damage not only in the Veneto, but also in Lombardy and northern Emilia. Earthquake effects also extended north of the Alps, with slight damage at Bamberg (Germany).

Our analysis of the effects of this second earthquake covered hundreds of localities. Of these, 40 in Italy have been classified by grade of intensity, the reliability of which varies according to the nature of the sources concerned. The lack of overall descriptions of effects at the various inhabited sites means that it has not always been possible to attribute a macroseismic scale intensity value to them, for the sources concentrate on damage to large individual church buildings. In order to classify the severity and type of damage to a single building, we have used a conventional scale (A, B, C and D, see Legend, p.15), with the result that the degree of severity concerned is conjectural.

Table. Time of earthquakes: concordance of the sources for distinguishing between the two events. The places indicated are the sites of the monasteries where the Annals were written (from Guidoboni *et al.* 2005).

** indicates that the source records both earthquakes

A - Austria D - Germany CZ - Czech Republic F - France I - Italy

During the night of 2-3 January 1117: concordance of the sources

first earthquake
night 2-3 January

where monasteries	time according to the original text	local time	UT	sources contemporary or based on lost 12th century annals
Disibodenberg D	<i>noctem</i> ["at night"]	16.15-08.00	15.45-07.30	<i>Ann. S.Disibodi</i> **
Freising D	<i>in nocte ante diem</i> ["at night before day"]	16.15-08.00	15.30-07.15	<i>Ann. S.Stephani Frisingensis</i> **
Salzbourg A	<i>semel in nocte</i> ["once at night"]	16.15-08.00	15.30-07.15	<i>Ann. S.Rudberti Salisburgensis</i> **
Augsburg D	<i>semel in nocte</i> ["once at night"]	16.15-08.00	15.30-07.15	<i>Eimon, Chron. (cod. August.)</i> **
Petershausen (Constance) D	<i>circa tertiam noctis vigiliam</i> ["about the third vigil of the night"]	00.30-04.00	00.00-03.30	<i>Casus monasterii Petrishuensis</i> **
St-Blasien D	<i>in galli cantu semel</i> ["once at cockcrow"]	03.00-05.00	02.30-04.30	<i>Ann. S.Blasii in Silva Nigra</i> **
Zwiefalten D	<i>in nocte</i> ["at night"]	16.15-08.00	15.45-07.30	<i>Ann. Zwiefaltenses</i> **
Melk A	<i>unus post tertium galli cantum</i> ["an (earthquake) after the third cockcrow"]	03.00-05.00	02.00-04.00	<i>Auctarium Zwettlenses</i> **

During the afternoon of 3 January 1117: concordance of the sources

second earthquake
afternoon 3 January

where monasteries	time according to the original text	local time	UT	sources contemporary or based on lost 12th century annals
Rheims F	<i>ad vespas</i> ["at vespers"]	16.15	16.00	<i>Ann. S.Dionysii Remenses</i>
Rheims F	<i>ad vesperum</i> ["at vespers"]	16.15	16.00	<i>Ann. Remenses</i>
Disibodenberg D	<i>diem</i> ["during the day"]	08.00-16.15	07.30-15.45	<i>Ann. S.Disibodi</i> **
Reinhardshrunn D	<i>ante solis occasum</i> ["before sunset"]	ante 16.15	ante 15.30	<i>Chronica S.Petri Erfordensis</i>
Aura D	<i>hora vespertina</i> ["at the hour of vespers"]	16.15	15.45	Eckehard of Aura, <i>Chronica</i>
Bamberg D	<i>hora vespertina</i> ["at the hour of vespers"]	16.15	15.30	Ebo of Michelsberg, <i>Vita Ottonis episc. Babenbergensis</i>
Heilsbronn D	<i>ad vesperascente die</i> ["as the day drew towards vespers"]	16.15	15.30	<i>Notae Halesbrunnenses</i>
Freising D	<i>ante vesperam</i> ["before vespers"]	16.15	15.30	<i>Ann. S.Stephani Frisingensis</i> **
Salzbourg A	<i>semel in die</i> ["once during the day"]	08.00-16.15	07.15-15.30	<i>Ann. S.Rudberti Salisburgensis</i> **
Augsburg D	<i>semel in die</i> ["once during the day"]	08.00-16.15	07.15-15.30	<i>Eimon, Chron. (cod. August.)</i> **
Petershausen (Constance) D	<i>undecima fere hora</i> ["almost at the eleventh hour"]	15.50	c.15.15	<i>Casus monasterii Petrishuensis</i> **
St-Blasien D	<i>ad nonam</i> ["at the ninth hour"]	12.15-14.35	11.45-13.55	<i>Ann. S.Blasii in Silva Nigra</i> **
Zwiefalten D	<i>et die</i> ["and by day"]	08.00-16.15	07.30-15.45	<i>Ann. Zwiefaltenses</i> **
Zwiefalten D	<i>post vespas</i> ["after vespers"]	post 16.15	post 15.30	Berthold of Zwiefalten, <i>Chron. monasterii Zwiefaltensis</i>
Prague CZ	<i>hora iam vespertinali</i> ["already at the hour of vespers"]	16.15	15.15	Cosmas of Prague, <i>Chronica Boemorum</i>
Melk A	<i>hora quasi 10</i> ["almost at the tenth hour"]	c.15.00	c.14.00	<i>Auctarium Zwettlenses</i> **
Milan I	<i>in hora vespera</i> ["at the hour of vespers"]	16.15	15.45	<i>Ann. Mediolanenses brevissimi</i>
Cremona I	<i>hora vesperarum</i> ["at the hour of vespers"]	16.15	15.30	<i>Ann. Cremonenses</i>

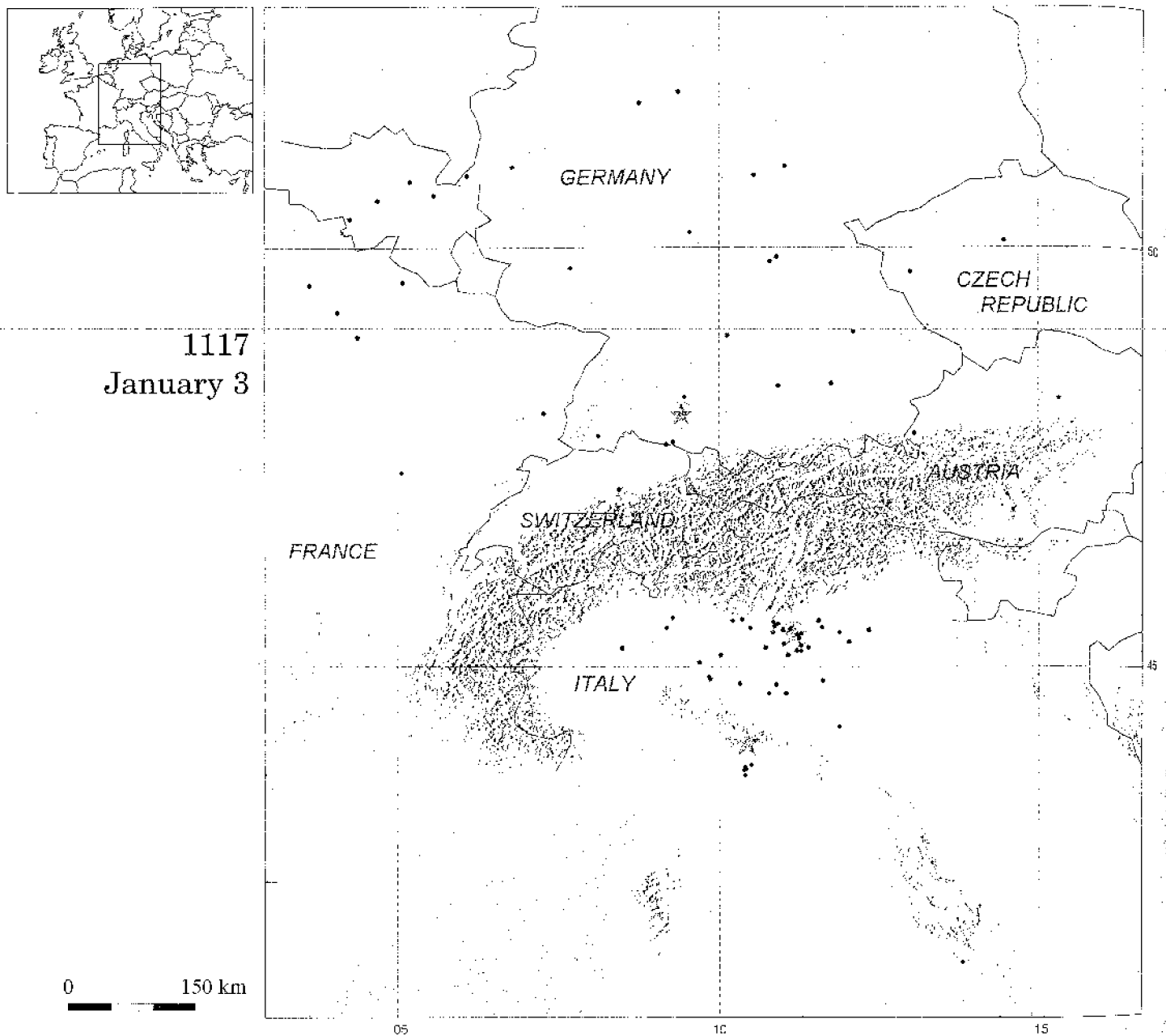


fig. 9 General map showing the three earthquakes of 3 January 1117: for the earthquake in Tuscany, see the next entry.

Effects in Verona area

3 January 1117 during the afternoon [second earthquake]

Contemporary sources make specific reference to various towns as having been struck by the earthquake, and Verona is agreed to have been the worst damaged. It is indeed known that numerous Romanesque churches in the town were destroyed or badly damaged, and in many cases were not rebuilt. There was serious damage at some towns in the lower Veneto plain, in the area along the river Adige, in the region of Brescia and Cremona, and in the northern plain of Emilia. There is evidence of partial collapses affecting the cathedrals of Cremona, Padua, Vicenza, Piacenza and Parma, and the abbey of Nonantola. We have no data for the Apennine region, due to the lack of impor-

tant centres of culture capable of producing information.

Almost all the written sources are of ecclesiastical or monastic origin, and the damage they mention mostly relates to large towns and their cathedrals — the most important buildings of the time; but there is also important evidence concerning isolated monasteries and small villages. By using information about damage to individual church buildings from epigraphic sources, reliable historiography and the most authoritative studies by historians of Romanesque art, we have been able to put together a reliable general picture of effects. The written sources make no mention of individual private houses, most of which were made of wood at that time.

Time of the principal shocks in Verona area

Most contemporary sources date the earthquake to 3 January 1117. They use a variety of expressions to indicate the day: "*quarta feria*", i.e. Wednesday (3 January 1117 was indeed a Wednesday), a day which coincided with "the eighth of St. John the Evangelist", i.e. the eighth day after the feast of St. John, which was celebrated on 27 December; or else they refer to the eve of the feast of St. Rigobert, which was celebrated on 4 January. In many sources, the day of the earthquake is recorded using the medieval system, which derives from classical Latin culture and counts the early days of the month backwards from the "Nones". In January, the Nones fell on the fifth day of the month, and so, counting backwards in the ancient fashion, we find that "3 nonas" is 3 January. Those Italian sources which give the year as 1116 are in fact using either the Veneto dating style, in which the year began on 1 March, or the Incarnation style, in which it began on 25 March. This has the effect of backdating the earthquake.

Some sources, while independent of one another, agree in recording two earthquakes: the first at early dawn, or at any rate at a time when it was still dark; and the second, stronger earthquake during the afternoon, between 14:00 and 15:30 UT. We can associate this latter time span with the various expressions which refer to "the time of vespers", indicating the closing stages of the day before sunset. The time lapse between the two earthquakes can be assessed at approximately 9-11 hours.

Judging from the sources, the overall duration of the strongest earthquakes was between 30 and 40 days (*Annales Ferrarienses*, p.663; *Annales Melrosenses*, p.434).

Affected towns and cathedrals under construction

As we have pointed out, the most striking evidence about earthquake damage concerns the towns of northern Italy, and especially those in the Po Plain, including the Veneto and northern Emilia. In order to reach a better understanding of this picture of effects, it is appropriate to call to mind certain aspects of the history and demography of this inhabited area (Guidoboni *et al.* 2005).

In the early decades of the 12th century, northern Italian towns still had a strong mixture of urban and rural characteristics, with large uninhabited spaces inside the walled area and a small inhabited nucleus.

Populations were small, or at least appreciably below the levels reached in the second half of the 13th century — a time for which the first estimates of population numbers can be made. In the case of Verona, an inevitably approximate assessment suggests about 12,000 inhabitants. Building types were beginning to vary, in accordance with the increasing socio-economic diversification of the urban classes, but the use of wood in private building still persisted strongly, especially amongst the less wealthy classes, while brick and stone were usually reserved for buildings of major political and religious significance, such as cathedral churches, public buildings and towers.

In 12th century Italy, cathedrals were the buildings which required the greatest technical and economic input, for their construction involved the whole urban population of the town concerned, partly because of the political significance that the principal

church was acquiring within the developing urban ideology of Italian towns, and also because the material requirements of such large building sites necessarily absorbed local and non-local labour. In the early decades of the 12th century, therefore, we find the widespread construction and reconstruction of church and secular buildings going on in many Italian towns. It should not be forgotten that construction work on major church and secular buildings could last for decades, partly because of the technical difficulty of carrying out such very exacting work with the limited means available, and also because of clashes between local authorities and bishops, or between pro-papal and pro-imperial factions, which represented at local level the opposition between the two greatest powers in medieval Europe.

At Brescia, there is evidence of work on the church of S.Maria del Solaro in 1120, at the old cathedral between 1110 and 1130, and at S.Salvatore and S.Faustino in 1152.

It was during the decades on either side of the earthquake that Cremona had most building sites in operation: its cathedral was begun in 1107 and damaged during construction in 1117; work began again in 1129, along lines which were partly different from the original plans. The churches of S.Faustino and S.Giacomo were begun in 1120 and 1126 respectively. There is evidence of rebuilding work, on the other hand, at the early medieval churches of S.Lucia (1120), S.Omobono (1120), S.Donato (1129) and S.Silvestro (1130). S.Michele was destroyed by fire in 1113 and rebuilt in 1124, so it was already damaged when the earthquake struck in January 1117.

At Mantua, there is evidence of work on the church of S.Lorenzo in 1115, on the cathedral in 1132 and 1141, at S.Gervasio between 1130 and 1140, and at S.Stefano in 1154.

At Padua, work was going on at the S.Sofia building site from 1106 until 1129.

As regards the Verona area, inscription sources provide widespread evidence of restoration or refoundation work at many church buildings: 12 out of 18 inscriptions discovered and analysed refer to churches in Veronese territory (see the relevant paragraph below).

Historical sources: an overall view

ARCHIVAL DOCUMENTATION

Research into unpublished archive documents was carried out for Italy only. By examining the principal collections of 12th century documents, we were able to gather some evidence about the 1117 earthquake. It was not so much a case of direct information about effects, but rather statements about their perception in contemporary culture. At this point, however, it must be remembered that the scarcity of documents is a result of their destruction in the course of time at the archives of the commune of Verona, where pre-15th century documentation is preserved only in part.

That the earthquake became a reason for penitence is shown by one document in which a Veronese count, partly as a sign of penitence but principally because of the great fright he had received, renounced the tithes he himself drew "by force" from the church of S.Giovanni Battista in Verona (Archivio di Stato, Verona, *Corporazioni religiose*, Congregazione del clero intrinseco, b.13, cart. no.7, 1327 copy).

Another document containing indirect evidence of the earthquake's effects is a deed of 1127 in the Archivio Segreto Vaticano (*Cancellaria della Nunziatura Veneta*, San Giorgio in Braida, 30, 1, doc. no.6886). The deed is an order by the bishop of Verona for the resumption of services in the church of S.Giorgio in Braida.

The earthquake was such a striking event in the collective memory of many local communities that people used it to date their personal recollections, placing the events concerned chronologically *before* or *after* the earthquake. In this connection, it is worth noting the frequency with which references to the earthquake for dating purposes occur in parchments from the Piacenza and Brescia areas, there being little other evidence from that region. In the Archivio Capitolare of the church of S.Antonino in Piacenza (*Diplomatico*, Atti Privati [ex C.39, ex D.39], no.606, no.1054, no.1055,



fig. 10 Verona (northern Italy). Twelfth century parchment, a legal action. A witness recalls the 1117 earthquake as a chronological reference for the facts in question: "and he added that there was an earthquake in that same year" (Archivio di Stato, Verona, *Antichi archivi comunali*, Ospitale, b.4, no.223).

no.1073), we found that four of these very old parchments mention the earthquake for dating purposes. This happens in witness statements in a lawsuit between the commune and the bishop of Piacenza over ownership of some mills. And in a lawsuit between the bishop and the canons of S.Antonino, three of the bishop's servants date their court evidence on the basis of their memory of the position of boundaries (the subject of the litigation) before and after the 1117 earthquake (no.1073). There are another two similar witness statements in a dispute between the same canons of S.Antonino and some private individuals (no.606).

There are also some documents which may have been drawn up in connection with reconstruction work at the church of S.Antonino in Piacenza, but which do not refer explicitly to the earthquake. They are in a fragment of a ledger of church income and expenditure, now preserved in the Archivio Capitolare of that church (*Diplomatico*, Atti Privati [ex B.12], nos.751, 752). The ledger records the cost of 2550 *libbre* of lead and builders' wages for repairing the church roof and the balconies on its tower. These documents date to 1150-1153, and may relate to earthquake damage, though that is not specified, as was usual in those days.

There are also five documents from the monastery of S.Pietro in Monte Ursino at Serle, in the Brescia area, which use the earthquake to date events in the personal lives of witnesses in disputes between the abbots of the monastery and some property owners. Since these documents date to several decades after the 1117 earthquake (to 1163, 1175, 1183 and 1186, in fact) they confirm the importance of the event in the life of this rural community (Barbieri and Cau 2000, docs. no.74, no.85, no.86, no.97 and no.114, digital publication edited by Michele Ansani).

There is also a reference to the earthquake in a witness statement concerning Caresana (Vercelli), made by a priest called Albino of Torcello. The document is in an unpublished parchment in the Archivio Capitolare at Vercelli. It is undated, but must belong roughly to the years 1160-1180 (Ferraris 1988, pp.48, 125 note 194). There are also two deeds of gift in favour of the cathedral of S.Pietro in Mantua (ed. Torelli 1924, pp.26, 28) which may relate to the earthquake, though it is not actually mentioned. It is declared in the documents that income from the donation is to be used for repairing the church, which was in fact restored between 1132 and 1141.

ANNALS AND CHRONICLES

We systematically consulted and analysed the principal collections of 12th century annal sources published in the *Monumenta Germaniae Historica* and the *Rerum Italicarum Scriptores* (both Muratori's 18th century edition, and that of the early 20th century). Other chronicles used were in editions edited by historians, and specialised journals. In this way, we obtained an organic picture of chronicle and annal sources within their context, and within the particular cultural climate which led to their compilation. References to this seismic sequence were found in a total of 123 annal or chronicle sources.

The greatest semantic homogeneity is found above all in monastic annals and chronicles, which constitute a clear majority of the texts examined, and mostly come from a vast area of central and western Europe: as many as 39 from Germany, 7 from Great Britain, 14 from northern France and 6 from Belgium, not to mention important references in chronicles from Austria (4), Czech Republic (6), Switzerland (1) and the Netherlands (1). There are at least 45 references in Italian chronicles from the major towns of Lombardy, the Veneto and Emilia.

From a social and cultural point of view, the unity of the monastic world permitted a continuous exchange of personnel and information through a close-knit network of abbeys linking central Europe and northern Italy. These interchanges were facilitated by the use of Latin as a common language, and by a consciousness of belonging to a single religious community. However, religious sensitivity to natural phenomena led many writers to interpret the earthquake as a sign of divine power, a combined warning and punishment, or a sign of the approaching end of the world. This last eschatological and apocalyptic interpretation, with its evident moral purpose, often gave to an account a dimension which was not linked to specific space and time contexts. This means that not all reports can be linked to a specific geographical location.

On the other hand, the diffusion of town chronicles in Italy as early as the mid-12th and early 13th centuries made it possible to track down less vague evidence of the earthquake in urban circles. Writers often referred to slightly earlier documents or chronicles which are now lost. The principal contemporary historians also devoted more than a passing reference to the earthquake: in his *Historia*, Landulf the Younger is writing about Milan when he interprets the earthquake as a divine punishment for internal disorders within the Milanese clergy; and Abbot Otto of Freising, who was Frederick Barbarossa's uncle, records the earthquake in a similar way, providing us with an interesting and problematic item of evidence (for this question, see the paragraph *Earthquake's effects by locality: Adige Valley*).

INSCRIPTIONS

It is perhaps worth pointing out that there is no corpus of medieval inscriptions for Italy. We therefore undertook an analysis of inscriptions in buildings themselves, as transcribed in historiographical works or recorded in museum inventories. This part of the research was effected by a working group in the 1980s and 1990s (Guidoboni 1984 and Guidoboni *et al.* 1986) and has recently been revised for this catalogue.

Very extensive research was thus carried out, including *in situ* visits, leading to the dis-

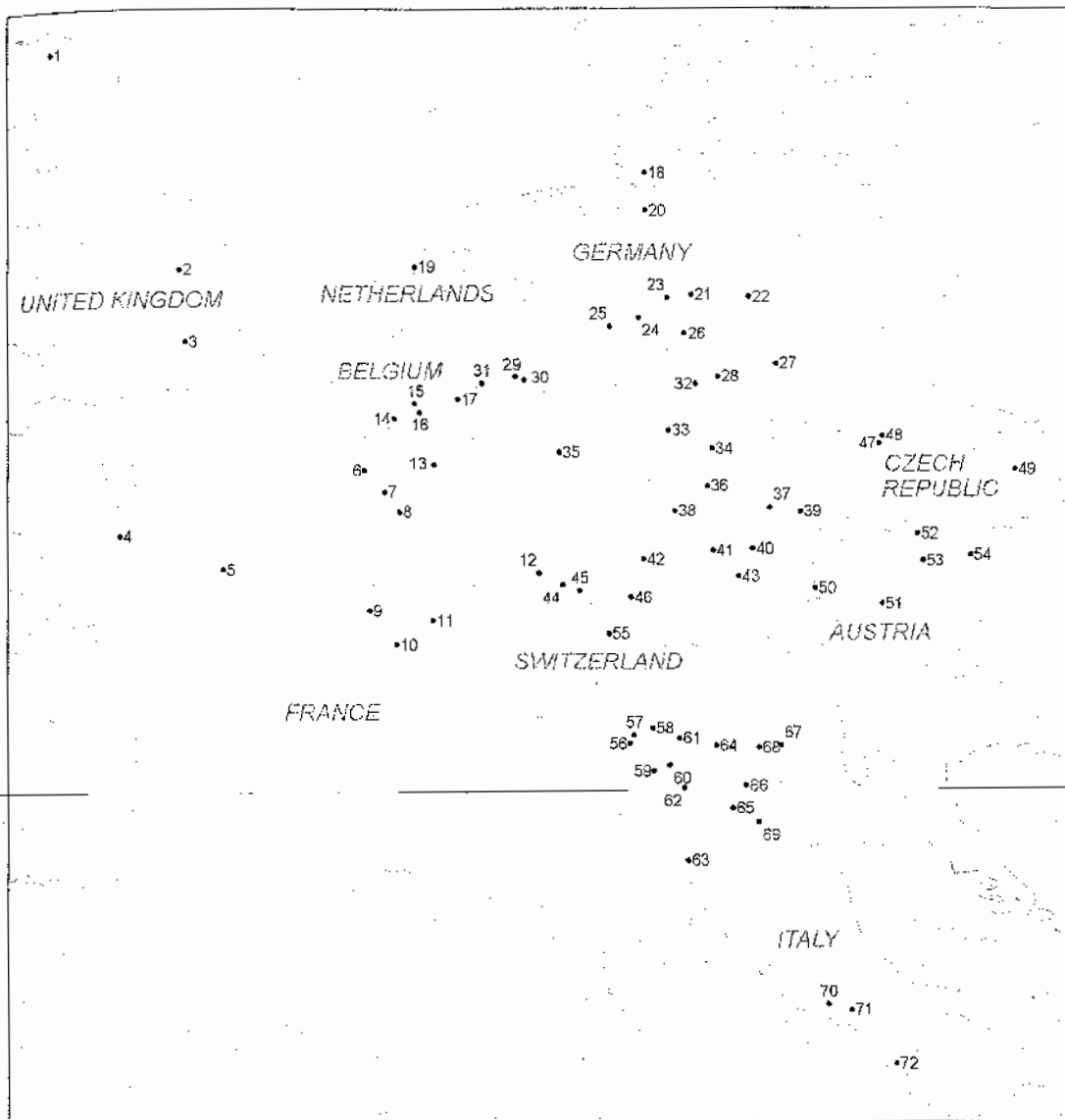


fig. 11 Location of the monasteries whose Annals record the earthquake of 3 January 1117 (shown within present-day States). This overall image of the "fame" of the earthquake derives from contemporary texts as well as those of later centuries (12th - 15th). The asterisks in the legend indicate what we believe to be places which suffered earthquake effects.

- | | | | |
|-------------------|-------------------|----------------------|-----------------|
| 1* Melrose | 19* Egmond | 37 Regensburg | 55 Einsiedeln |
| 2* Peterborough | 20* Harsefeld | 38 Ellwangen | 56 Milan |
| 3* London | 21* Stederburg | 39* Windberg | 57 Monza |
| 4* Mont-St-Michel | 22* Magdeburg | 40 Freising | 58 Bergamo |
| 5* St-Maixent | 23 Hildesheim | 41 Augsburg | 59 Piacenza |
| 6 Laon | 24 Corvey | 42 Zwiefalten | 60 Cremona |
| 7 Rheims | 25 Paderborn | 43 Schäftlarn | 61 Brescia |
| 8 Châlons | 26* Pöhlde | 44* St.Trudpert | 62 Parma |
| 9* Vézelay | 27* Pegau | 45 St-Blasien | 63 Pisa |
| 10* Autun | 28 Erfurt | 46 Petershausen | 64 Verona |
| 11 Dijon | 29 Brauweiler | 47* Zbraslav | 65 Bologna |
| 12 Marbach | 30* Köln | 48 Prague | 66 Ferrara |
| 13 Mouzon | 31 Rolduc | 49* Kloster-Hradisch | 67 Venice |
| 14 Lobbes | 32 Reinhardsbrunn | 50* Salzburg | 68 Padua |
| 15 Gembloux | 33 Aura | 51* Admont | 69 Faenza |
| 16* Floreffe | 34 Bamberg | 52* Zwettl | 70 Ceccano |
| 17 Liège | 35 Disibodenberg | 53 Melk | 71 Montecassino |
| 18* Stade | 36 Heilsbronn | 54* Klosterneuburg | 72* Salerno |

covery of 18 inscriptions preserved in the churches of the Verona and Po Plain areas, dating to the period 1117-1178.

Four inscriptions directly related to the earthquake are preserved as follows:

- 1 – in the bell-tower of the church of S.Mauro at Costozza (Vicenza) (see fig. 18, p.106);
- 2 – in the cathedral of S.Maria Assunta in Padua;
- 3 – in the abbey of S.Silvestro at Nonantola (Modena) (see fig. 19, p.107);
- 4 – in the church of Ss.Faustino e Giovita, at San Faustino, near Rubiera (Reggio Emilia) (see fig. 21b, p.115)

Of the other 14, which offer indirect evidence of earthquake damage, special attention was paid to inscriptions on buildings in the urban and extra-urban areas of Verona. Five inscriptions in Verona recording the foundation, reconsecration or restoration of the buildings listed below are of particular interest, for they may refer to reconstruction work carried out after the earthquake. It must be remembered how important inscriptions recording the reconsecration of a church building can be, for the reconsecration was carried out when the site work was so extensive as to prevent church services from being held. This interruption — which usually lasted from a few years to a few decades — necessitated the reconsecration of the holy ground.

The inscriptions regarding Verona relate to the following churches:

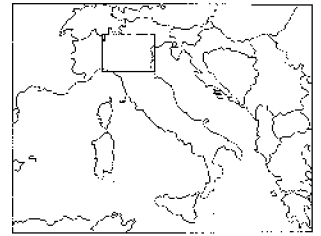
- 5 – cloister of the church of S.Zeno, 1123 (Porter 1917; Arslan 1939);
- 6 – church of S.Zeno, inscription of 1178, recording the restoration or reconstruction of the building in 1120 and its widening in 1138 (Porter 1917; Arslan 1939; Da Lisca 1941; Ederle 1977);
- 7 – church of S.Fermo Maggiore, 1143 (Da Lisca 1909; Simeoni 1913; Porter 1917; Arslan 1939);
- 8 – church of S.Fermo Minore in Braida, 1139: inscription now lost (Da Lisca 1909);
- 9 – church of S.Maria in Organo, 1131: inscription now lost (Simeoni 1913).

For the Verona, Padua and Piacenza areas, we provide a summary list of the 9 inscriptions which we think most likely to be related to the earthquake, our aim being to enhance an overall view of the sources consulted and the criteria applied. These inscriptions are set out below in chronological order:

- 10 – San Pietro, a village near Legnago (Verona): the inscription, dated 1117, is near the apses in the church of S.Salvaro (Porter 1917; D'Arcais 1981a, b) (see fig. 21c, p.115);
- 11 – Piacenza: the inscription, dated 1122, is on the cathedral architrave (Porter 1917). Its interpretation is a matter of debate: it may refer to the date of foundation of the church, or to its rebuilding;
- 12 – Gazzo Veronese (Verona): inscription in the church of S.Maria Maggiore, is of uncertain date between 1125 and 1137 (Porter 1917; Da Lisca 1941);
- 13, 14 – Isola della Scala (Verona): two inscriptions survive: one is in the small church of La Bastia, and bears the names of the architects; the second (see fig. 23, p.121) is at the abbey and dates to 1130 (D'Arcais 1981a, b);
- 15 – Piove di Sacco (Padua): inscription in the church of S.Martino which records the reconsecration of the building in 1129 (Pinton 1891).
- 16 – San Bonifacio (Verona): inscription in the abbey of S.Pietro Apostolo (in the little *frazione* of Villanova) dates to 1131, the year in which work began on the bell-tower (Porter 1917; Arslan 1939) (see fig. 21a, p.115);
- 17 – Belfiore (Verona): inscription in the church of S.Michele (also called Madonna di Stra) bears the name of the builders and the date 1143 (Porter 1917; Arslan 1939);
- 18 – Bevilacqua (Verona): inscription (see fig. 22, p.119), dated 1161, at the church of S.Pietro in Cantalovo (Castagnetti 1976; D'Arcais 1981a, b).

Research into surviving churches and related reconstruction work

As we have pointed out, one way in which we tried to improve our knowledge of this great medieval earthquake was to conduct a historical analysis of surviving church



1117 inscriptions

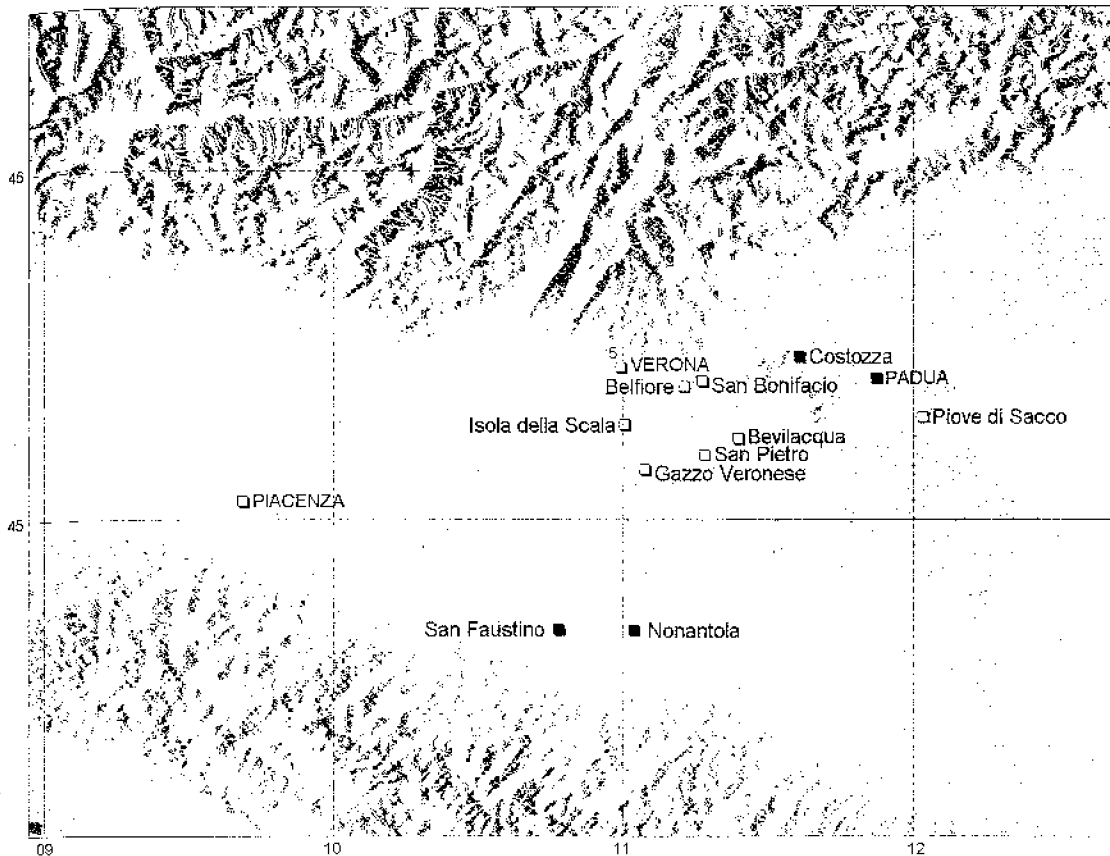
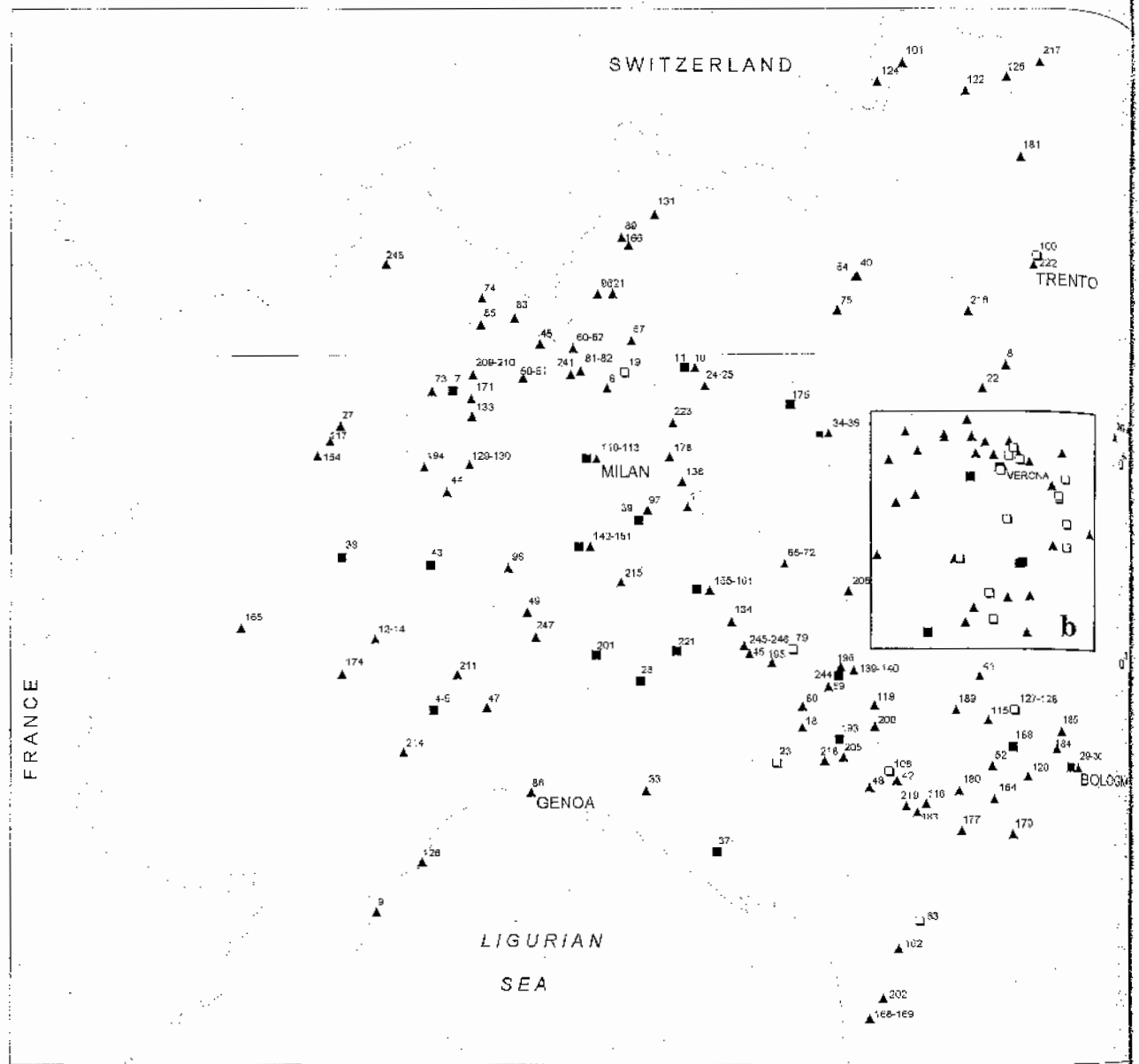


fig. 12 Northern Italy, Po Plain: location of the 18 inscriptions reporting ■ direct information [in total 4] and □ indirect (see text) information [in total 14] on the local effects of the earthquake on 3 January 1117. There are 5 inscriptions at Verona.

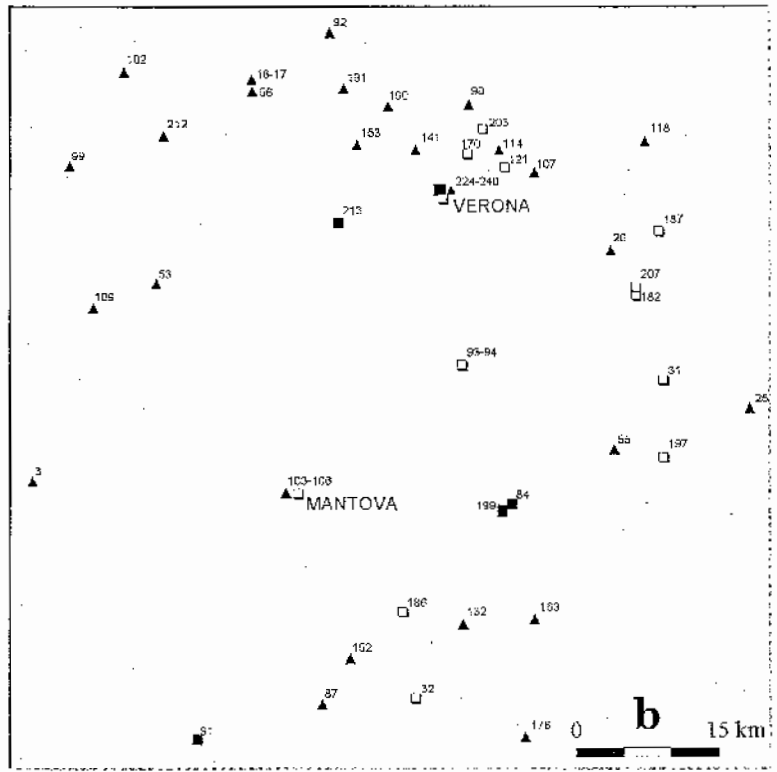
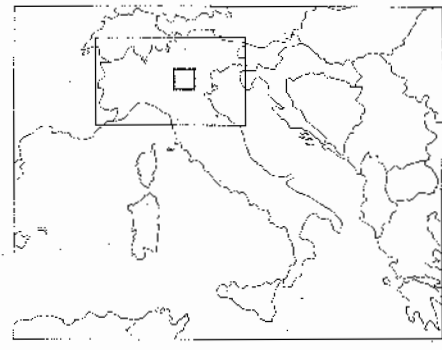
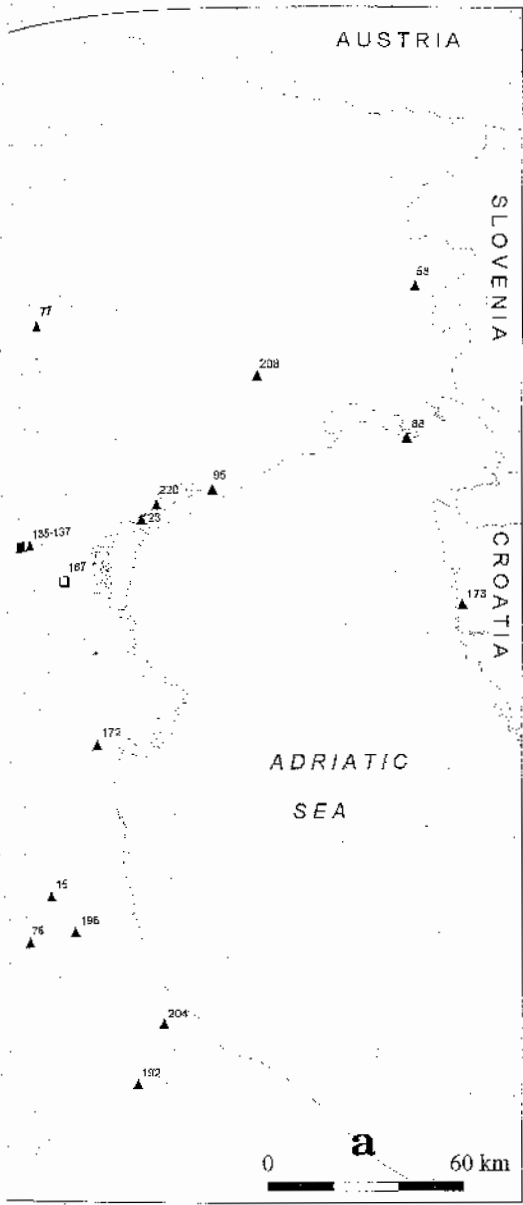
buildings. By examining specialist bibliographies concerning individual buildings in northern Italy, we were able to list 248 ecclesiastical buildings known to have existed at the time of the earthquake. The research was carried out in collaboration with Mauro Librenti (see Guidoboni *et al.* 1986). It may be worth mentioning that our list of these buildings and the related chart were made for analytical purposes, because there was and is no summary list of 12th century ecclesiastical buildings: all that is available is a sort of "atomised" bibliography, consisting of countless studies at different levels. The buildings concerned are cathedrals, abbey churches and churches in rural communities. In the Po Plain area between Mantua and northern Emilia, we did not identify any buildings bearing evident signs of restoration work necessitated by the earthquake. In many of these cases, later modifications have made it impossible to arrive at an immediate identification of construction stages; in other buildings, such as the abbey of San Benedetto in Polirone (San Benedetto Po), there were cultural and liturgical reasons for reconstruction work which had nothing to do with the earthquake. In the area around Parma, and especially in the Val di Taro, the number of early medieval buildings with substantial 12th century modifications is very high — so high that, for lack of any other explanation, it seems reasonable to include the area in the widespread damage zone.

The situation in the Verona area varies, however. In the north-west, towards Lake Garda, there are generally speaking architectural survivals which go back to well before the 12th century. But in the southern plain, where we listed 15 buildings, we found important signs of damage in at least four churches beside the river Po: those of



figg. 13 a and b Northern Italy: location of the 12th century Romanic churches Total no.248
(elaborated from Guidoboni 1984)

- | | | | | | | | |
|-------|---------------------------------------------------------------|-------|-----------------------------------------------------------------|-------|-----------------------------------------------------------------------------------------------------------------|---------|--------------------------------------------------------------|
| 1 | Abbadia Cerreto IO, S.Maria ▲ | 31 | Bonavigo VR, S.Maria □ | 59 | Collecchio PR, S.Prospero ▲ | 93-94 | Isola della Scala VR, small church ▲ |
| 2 | Abbazia di Praglia PD, abbey □ | 32 | Bondanello MN, S.Croce □ | 60-62 | COMO, S.Carpoforo ▲; S.Abondio ▲; S.Fedele ▲ | 95 | Jasolo VR, S.Maria ▲ |
| 3 | Acquanegra sul Chiese MN, S.Tommaso ▲ | 33 | Borzone GE, S.Andrea ▲ | 63 | Controne LU, S.Cassiano □ | 96 | Lenno CO, S.Stefano ▲ |
| 4-5 | Acqui AL, cathedral ▲; S.Pietro ▲ | 34-36 | BRESCIA, old cathedral ▲; S.Salvatore ▲; S.Faustino e Giovita □ | 64 | Costozza VI, S.Mauro □ | 97 | Lodi Vecchio IO, S.Bassiano ▲ |
| 6 | Agliate MI, S.Pietro ▲ | 37 | Brugnato SP, S.Pietro ■ | 65-72 | CREMONA, cathedral ▲; baptistery ▲; S.Lorenzo ▲; S.Michele ▲; S.Lucia ▲; S.Omobono ▲; S.Donato ▲; S.Silvestro ▲ | 98 | Lomello PV, S.Maria Maggiore ▲ |
| 7 | Agrate Conturbia NO, baptistery ■ | 38 | Brusasco TO, S.Pietro Vecchio ■ | 73 | Cureggio NO, baptistery ▲ | 99 | Lonato BS, S.Zeno ▲ |
| 8 | Ala TN, S.Pietro in Bosco ▲ | 39 | Calvenzano LO, S.Maria ■ | 74 | Domo Valtravaglia VA, baptistery ▲ | 100 | Maderno BS, S.Andrea □ |
| 9 | Albengo SV, baptistery ▲ | 40 | Capo di Ponte BS, S.Salvatore ▲ | 75 | Esine BS, S.Trinità ▲ | 101 | Malles Venosta BZ, S.Benedetto ▲ |
| 10 | Almenno San Bart. BG, S.Tommaso L. ■ | 41 | Carpi MO, S.Maria ▲ | 76 | Faenza RA, S.Maria ad Nives ▲ | 102 | Manerba BS, S.Maria ▲ |
| 11 | Almenno San Salvatore BG, Madonna del Castello ▲ | 42 | Carpinetti RE, S.Andrea in Castello ▲ | 77 | Feltre BL, Ognissanti ▲ | 103-106 | MANTOVA, S.Lorenzo ▲; S.Stefano ▲; cathedral ▲; S.Cervasio □ |
| 12-14 | ASTI, S.Anastasio ▲; S.Pietro ▲; S.Secondo ▲ | 43 | Casale Monferrato AL, S.Evasio ■ | 78 | FERRARA, cathedral □ | 107 | Marcellise VR, ch. of La Madonna ▲ |
| 15 | Bagnasacco RA, S.Pietro in Silvis ▲ | 44 | Casalino NO, Ss.Pietro e Paolo ▲ | 79 | Fidenza PR, cathedral □ | 108 | Marola RE, abbey □ |
| 16-17 | Bardolino VR, S.Severo ▲; S.Zeno ▲ | 45 | Casanova Lanza CO, S.Andrea ▲ | 80 | Forano di Taro PR, S.Maria Assunta ▲ | 109 | Medole MN, S.Maria della Pieve ▲ |
| 18 | Bardone PR, S.Maria ▲ | 46 | Castell'Arquato PC, L'Assunzione ▲ | 81-82 | Galliano CO, S.Vincenzo ▲; baptistery ▲ | 110-113 | MILAN, S.Vincenzo ▲; S.Ambrogio ■; S.Lorenzo Maggiore ▲ |
| 19 | Barzani LO, S.Salvatore □ | 47 | Castelletto d'Orba AI, S.Innocenzo ▲ | 83 | Ganna VA, S.Germolo ▲ | 114 | Mizzole VR, S.Micheletto ▲ |
| 20 | Belliove VR, S.Michele or Mad. di Sura ▲ | 48 | Castelnovo ne' Monti RE, S.Maria ▲ | 84 | Gazzo Veronese VR, S.Maria Maggiore ■ | 115 | MODENA, cathedral ▲ |
| 21 | Bellagio CO, S.Maria ▲ | 49 | Castelnuovo Scrvia AI, S.Pietro ▲ | 85 | Gemonio VA, S.Pietro ▲ | 116 | Monchio MO, S.Giulia ▲ |
| 22 | Belluno Veronese VR, S.Andrea ▲ | 50-51 | Castelseprio VA, S.Giovanni ▲; S.Maria ▲ | 86 | GENOVA, S.Lorenzo ▲ | 117 | Mongrando BI, S.Maria del Castello ▲ |
| 23 | Berceto PR, cathedral □ | 52 | Castelvetro MO, S.Michele ▲ | 87 | Genzago MN, S.Benedetto ▲ | 118 | Montecchia di C. VR, S.Salvatore di C. ▲ |
| 24-25 | BERGAMO, S.Croce ▲; S.Maria Maggiore ▲ | 53 | Cavriana MN, S.Maria della Pieve ▲ | 88 | Grado GO, S.Eufemia ▲ | 119 | Montechiarugolo PR, S.Felicola ▲ |
| 26 | Bevilacqua VR, S.Pietro ▲ | 54 | Cemmo BS, S.Siro ▲ | 89 | Gravedona CO, S.Vincenzo ▲ | 120 | Montevoglio BO, S.Maria Assunta ▲ |
| 27 | BIELLA, baptistery ▲ | 55 | Cerea VR, S.Zeno ▲ | 90 | Crezzana VR, S.Salvatore di Castello ▲ | 121 | Montorio VR, parish church □ |
| 28 | Bobbio PC, S.Colombano ■ | 56 | Cisano VR, S.Maria ▲ | 91 | Guastalla RE, S.Giorgio ■ | 122 | Mortier BZ, S.Vigilio ▲ |
| 29-30 | BOLOGNA, S.Pietro, in S.Stefano ▲; S.Sepolcro, in S.Stefano ■ | 57 | Civate LC, S.Pietro al Monte ▲ | 92 | Incanale VR, S.Zeno ▲ | | |
| | | 58 | Civiale del F. TO, Lombard Temple ▲ | | | | |



LEGEND

- ▲ buildings prior to the second decade of the 12th century no.198
- buildings with parts prior to and after the second decade of the 12th century no.23
- buildings with uncertain dating no.27

123 Murano VR, Ss.Maria e Donato ▲	S.Eufemia ▲; S.Sisto ▲	189 San Faustino RE, Ss.Faust. e Giovita ▲	214 Spigno Monferrato AL, S.Quintino ▲
124 Mustair CH, S.Giovanni ▲	162 Pieve di Brancoli MI, S.Giorgio ▲	190 San Floriano di V. VR, S.Floriano ▲	215 Stradella PV, S.Marcello di Montalbino ▲
125 Naturno BZ, S.Procolo ▲	163 Pieve di Coriano MN, S.M. Assunta ▲	191 San Giorgio di V. VR, S.Giorgio ▲	216 Tenno TN, S.Lorenzo ▲
126 Noli sv, S.Paragorio ▲	164 Pieve Trebbio MO, S.Giovanni ▲	192 San Leo PU, parish church ▲	217 Tirolo BZ, S.Pietro ▲
127-128 Nonantola MO, S.Silvestro LI; S.Michele Arcangelo □	165 Piobesi Torinese TO, S.Gio. dei Campi ▲	193 San Michele Cavara PR, S.Basilide ■	218 Tizzano PR, S.Pietro ▲
129-130 NOVARA, baptistery ▲; cathedral ▲	166 Piona LC, S.Nicolò ▲	194 San Nazario Sesia NO, S.Nazzaro ▲	219 Taano RE, Madonna del Castello ▲
131 Novate Mezzola so, S.Fedclino ▲	167 Piove di Sacco PD, S.Martino LJ	195 San Nicomede PR, S.Nicomede ▲	220 Torcello VE, S.Maria Assunta ▲
132 Nuvolato MN, S.Fiorentino ▲	168-169 riva, S.Pietro in Vincoli ▲; cathedral ▲	196 San Pancrazio PR, S.Pancrazio ▲	221 Travo PC, S.Maria ■
133 Oleggio NO, S.Michele al Camposanto ▲	170 Poiano VR, castle □	197 San Pietro di Legnago VR, S.Salvaro □	222 Trento, cathedral ▲
134 Paderna PG, S.Maria ▲	171 Pombia NO, S.Vincenzo ▲	198 San Pietro in Trento RA, S.Pietro ▲	223 Vaprio d'Adda MI, S.Colombano ▲
135-137 PAVIA, S.Sofia ■; S.Maria Assunta ▲; S.Giustina ▲	172 Pomposa FE, abbey ▲	199 San Pietro in Valle VR, S.Pietro ■	224-240 VERONA, S.Lorenzo ▲; S.Zeno ▲; cathedral ▲; Ss.Apostoli ▲; S.Elena ▲
138 Palazzo Pignano CR, S.Martino ▲	173 Porec HR, cathedral ▲	200 San Polo d'Enza RE, S.Pietro ▲	S.Permo Maggiore ▲; S.Giovanni in
139-140 PARMA, S.Croce ▲; cathedral ▲	174 Priocca CN, S.Vittore ▲	201 Sant'Alberto di Butrio PV, S.Alberto ■	Fonte ▲; S.Giovanni in Valle ▲;
141 Parma VR, S.Cristina ▲	175 Provaglio d'Iseo BS, S.Pietro in L. ■	202 Santa Maria del Giudice LU, S.Maria	S.Stefano ▲; Ss.Trinità ■; S.Procolo ▲
142-151 PAVIA, S.Pietro in Ciel d'Oro ▲; S.Michele ▲; S.Eusebio ■; S.Giovanni	176 Quarantoli MO, S.Maria ▲	del Giudice	S.Fermo Minore in B. ▲; S.Eufemia ▲;
in Borgo ▲; S.Lanfranco ▲; S.Maria	177 Renno MO, S.Giovanni Battista ▲	203 Santa Maria in Stelle VR, S.Maria □	S.Giorgio in B. LI; S.M. in Organo ▲;
del Popolo ▲; S.Stefano ▲; S.Maria	178 Rivolta d'Adda CR, S.Sigismondo ▲	204 Sant'Arcangelo di Romagna RC, S.Michele d'Arcevoli ▲	Arena ▲; S.Pietro in Castello ▲
delle Pertiche ▲; S.Maria d. Carce ▲; S.Salvatore S.Felice ▲	179 Rocca di Roffano BO, S.Lucia ▲	205 Sasso PR, S.Maria ▲	241 Vertemate CO, S.Giovanni Battista ▲
152 Poggonaga MN, S.Lorenzo ▲	180 Rocca Santa Maria MO, S.Maria ▲	206 Scandolara Ravara CR, old church ▲	242-243 VICENZA, Ss.Felice e Fortunato ▲;
153 Pescantina VR, S.Lorenzo ▲	181 Romello TN, S.Biagio ▲	207 Scardevara VR, Ss.Filippo e Giacomo □	S.Giovio ▲
154 Pessano di Bollengo TO, S.Pietro ▲	182 Ronco all'Adige VR, S.Maria □	208 Sesto al Reghena VR, S.Maria in S. ▲	244 Vicofertile PR, S.Geminiano ■
155-161 PIACENZA, S.Antonino ▲; cathedral ▲; S.Savino ▲; S.Matteo ▲; S.Brigide ■;	183 Rubbiano MO, S.Maria ▲	209-210 Sesto Calende VA, S.Donato ▲; S.Vincenzo	245-246 Vigolo Marchese PC, baptistery ▲; S.Giovanni ▲
	184 Sacerno BO, Rotonda ▲	211 Sezzadio AL, S.Giustina ▲	247 Viguzzolo AT, camelery chapel ▲
	185 Sala Bolognese BO, S.Biagio ▲	212 Sirmione BS, S.Pietro in Mavino ▲	248 Viliadossola VR, S.Bartolomeo ▲
	186 San Benedetto Po MN, S.Benedetto □	213 Sommacampagna VR, S.Andrea ■	
	187 San Bonifacio VR, S.Pietro Apostolo □		
	188 San Cassario sul Panaro MO, S.Cesario ■		

S.Salvaro at San Pietro near Legnago, S.Zeno at Cerea, S.Maria Maggiore at Gazzo Veronese and S.Pietro at San Pietro in Valle (see fig. 13b). All these churches have architectural features which go back to 12th century restoration work governed by a specific need to preserve usable parts of existing structures. In the eastern Veneto, the building sample is appreciably smaller, both because of the effective absence of a close-knit settlement network, and also because of a lack of specific studies.

As for the Trentino, we find in the area around Merano the widespread survival of pre-Romanesque buildings going back to Carolingian times, or at any rate to before the 10th century. Since this preservation of pre-Romanesque structures also occurs outside Italy (in Switzerland), we were led to believe that the north-eastern and eastern Veneto and Alto Adige areas are to be excluded from the most serious damage zone.

The results of this investigation were particularly useful in confirming that damage had occurred in extra-urban as well as urban areas. The overall picture of damage was thus typified by a general congruence of evidence, based on the reports of effects at particular towns or monasteries. However, keeping in mind that these observations about damage to church buildings, although useful indicators, derive from very special indirect sources, such sites have been classified separately.

Earthquake on 3 January 1117: type and number of the works analysed no.379

- 1. sources 1
 - 1a. documents 14 (4%)
 - 1b. Annals, chronicles, *Notulae* 69 (18%)
- 2. inscriptions 18 (5%)
- 3. sources 2 60 (16%)
 - Total sources no.161
- 4. historiography 51 (13%)
- 5. architectural history 124 (33%)
- 6. literature 8 (2%)
- 7. catalogues
 - 7a. descriptive 27 (7%)
 - 7b. parametric 8 (2%)
 - Total other texts no.218

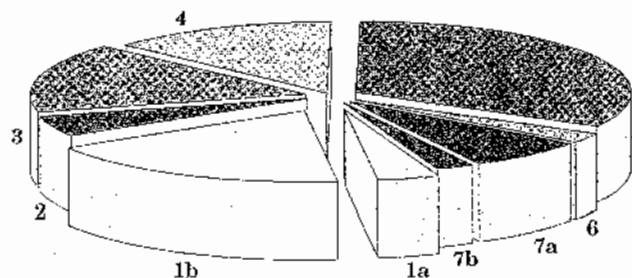


fig. 14

Earthquake's effects by locality, based on written and epigraphic sources
(in descending order of effects; see parameters p.126)

Verona

Verona was the worst affected town, and we have reliable evidence of serious and widespread damage there. According to the historian Mor (1964), the economic and social crisis which gripped Verona immediately after the earthquake provided an opportunity for a new urban class to gain power. The structure of this class meant that it was now clearly ready for such an enterprise, and it set up an autonomous form of local government. Verona was in fact one of the earliest Italian communes.

There is evidence of damage to the following buildings (see fig. 16):

- part of the outer wall of the "Arena" (ancient amphitheatre);
- the church of S.Zeno (probably the upper part only): an inscription of 1123 records restoration work on the cloister, and another, of 1178, towards the west end of the south aisle, records the restoration or rebuilding as well as the widening of the church in 1138 (Porter 1917; Arslan 1939; Da Lisca 1941; Ederle 1977).

Other inscription evidence may relate to post-earthquake reconstruction work at the following buildings:

- S.Fermo Maggiore: an inscription of 1143, discovered during restoration of the façade and perhaps belonging to the bell-tower which was demolished in the 13th century, records reconstruction work (Da Lisca 1909; Simeoni 1913; Porter 1917; Arslan 1939);

- S.Fermo Minore in Braida: an inscription of 1139 records its reconsecration (Da Lisca 1909);
- S.Maria in Organo: an inscription of 1131 records its reconsecration (Simeoni 1913). Literature on the architecture of the period was surveyed, and the most convincing hypotheses about damage at the following churches were accepted:
- S.Lorenzo: the church was founded in the early medieval period and rebuilt in the second half of the 11th century. According to Da Lisca (1935), the 1117 earthquake caused particular damage to the side walls and less severe damage to those at the front and rear. The church was later repaired and partly rebuilt, following the earlier plan. An external examination of the masonry of the principal apse and the southern apse beside it revealed three distinct periods: the lower part can be dated to about the beginning of the 8th century, and the central part, about two metres high, seems to date to the beginning of the 9th century. The upper part belongs to the first half of the 12th century, and is made of courses of brick and tuff which Da Lisca (1935) and Arslan (1939) both identify as materials retrieved from earthquake debris.
- SS.Trinità: the church was founded in the second half of the 11th century and consecrated in 1117, but the high altar was not consecrated until 1132. The north apse dates to 1120 and the main apse to 1130. The atrium, which has clearly been added to the body of the church, also belongs to the latter period (Porter 1917; Arslan 1939; Romanini 1964).
- Ss.Apostoli: the church was founded in the early medieval period, and shows evidence of reconstruction stages in the first half of the 12th century (Porter 1917; Romanini 1964; Arslan 1939).
- S.Elena: the church was founded in the early medieval period and repaired in 1120-1130, but the earthquake spared most of the load-bearing structures (Brugnoli *et al.* 1979).
- S.Giovanni in Fonte: the church was founded in the early medieval period and reconsecrated in 1123. According to Porter (1917), the baptistery may have been destroyed in the earthquake; Simeoni (1913) also thinks the building was damaged in the 1117 earthquake.

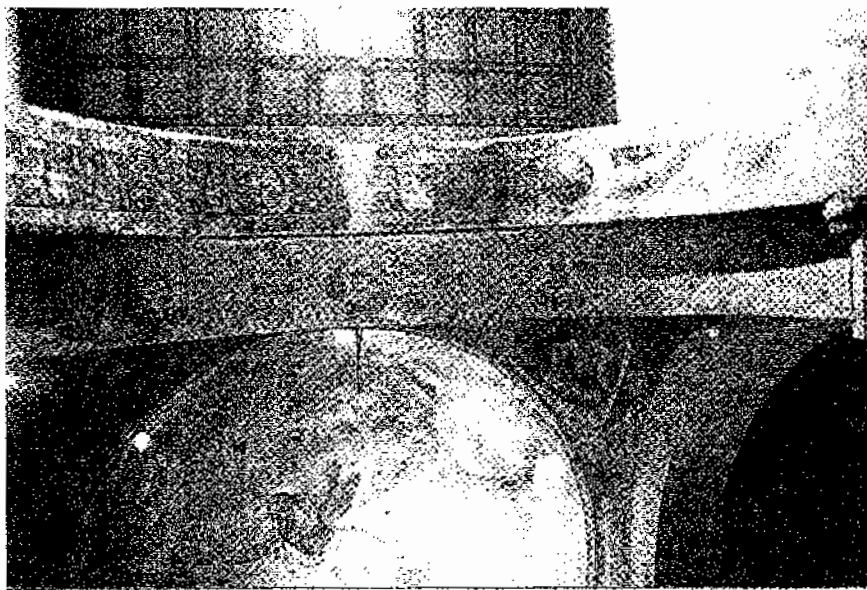


fig. 15 Verona, church of S.Stefano, inside the transept: example of a medieval 'restoration' after the earthquake damage on 3 January 1117. The original arches, painted with geometric motifs dating back to the Romanic period, were flanked in the second half of the 12th century by a doubled arch in order to support the new *liburio*, built after the collapse of the preceding one.

- S.Giovanni in Valle: the church was founded in the early medieval period, rebuilt in 1120 by Bishop Bernardo and reconsecrated in 1164 (Simeoni 1913; Romanini 1964; Arslan 1939).
- S.Stefano: the church was founded in the early medieval period and frequently altered up to the 11th century. Da Lisca (1936) has suggested that the 1117 earthquake seriously damaged the façade, caused the atrium and the upper part of the transept to collapse, and produced cracks in the domed vault of the apse, which was subsequently rebuilt and given reinforcement arches to support its roof. Da Lisca also suggests that four new pilasters were built to support the new cupola after the old one had collapsed on to the roof (see fig. 15).
- S.Eufemia: the church was founded in the early medieval period and reconsecrated in 1140. The Romanesque building was demolished in 1275 to allow rebuilding (Simeoni 1913).
- S.Giorgio in Braida: the church may have been founded in the early medieval period: in 1127 Bishop Bernardo of Verona arranged for reconstruction work to be undertaken there (Archivio Segreto Vaticano, *Cancellaria della Nunziatura Veneta*, San Giorgio in Braida, 30, 1, no.6886).
- S.Procolo: the church was founded in the early medieval period. It is thought to have been built in two stages: one before and one after the 1117 earthquake, the latter perhaps necessitated by earthquake damage (Porter 1917; Arslan 1939).
- S.Pietro in Castello: the church was founded in the early medieval period. Arslan (1939) thinks it was rebuilt around 1120-40 by Bishop Bernardo of Verona. As we have seen, Bishop Bernardo was particularly active in promoting reconstruction work at church buildings — see also his initiative at Ronco all'Adige (Verona).
- the cathedral: it was founded in the early medieval period, the first building phase taking place in the years 1120-40; it was reconsecrated in 1187. Simeoni (1913) thinks it was damaged in the earthquake.

In the south-eastern outskirts of Verona, along the course of the river Adige, we notice a consistent decline in the number of buildings dating to before 1117.

There are both documentary and chronicle sources for Verona.

DOCUMENTARY SOURCES FOR VERONA

On 24 January 1117, Viscount Rodolfo of Verona renounced a tithe from the church of S.Giovanni Battista as a sign of repentance. The document in question is preserved in a 1327 copy (Archivio di Stato, Verona, *Corporazioni religiose*, Congregazione del clero intrinseco, b.13, cart. no.7, fol.117):

"But the above-mentioned viscount, who normally requested and claimed a tithe [of that vineyard] and sometimes obtained it by violent means, until the day when the town of Verona was destroyed by so great an earthquake [...] when his considerable fear and disturbance of mind and body was noted by the priest of the above-mentioned church, in the name of Almighty God, the said viscount was summoned and asked to permit what in many ways he had previously prevented, and put an end to it in the fear of God and for the salvation of his soul [...] On Sunday 24 January in the year 1117, in the tenth indiction, at the church of S.Giovanni Battista and in the presence of the above-mentioned persons, Viscount Rodolfo granted this.

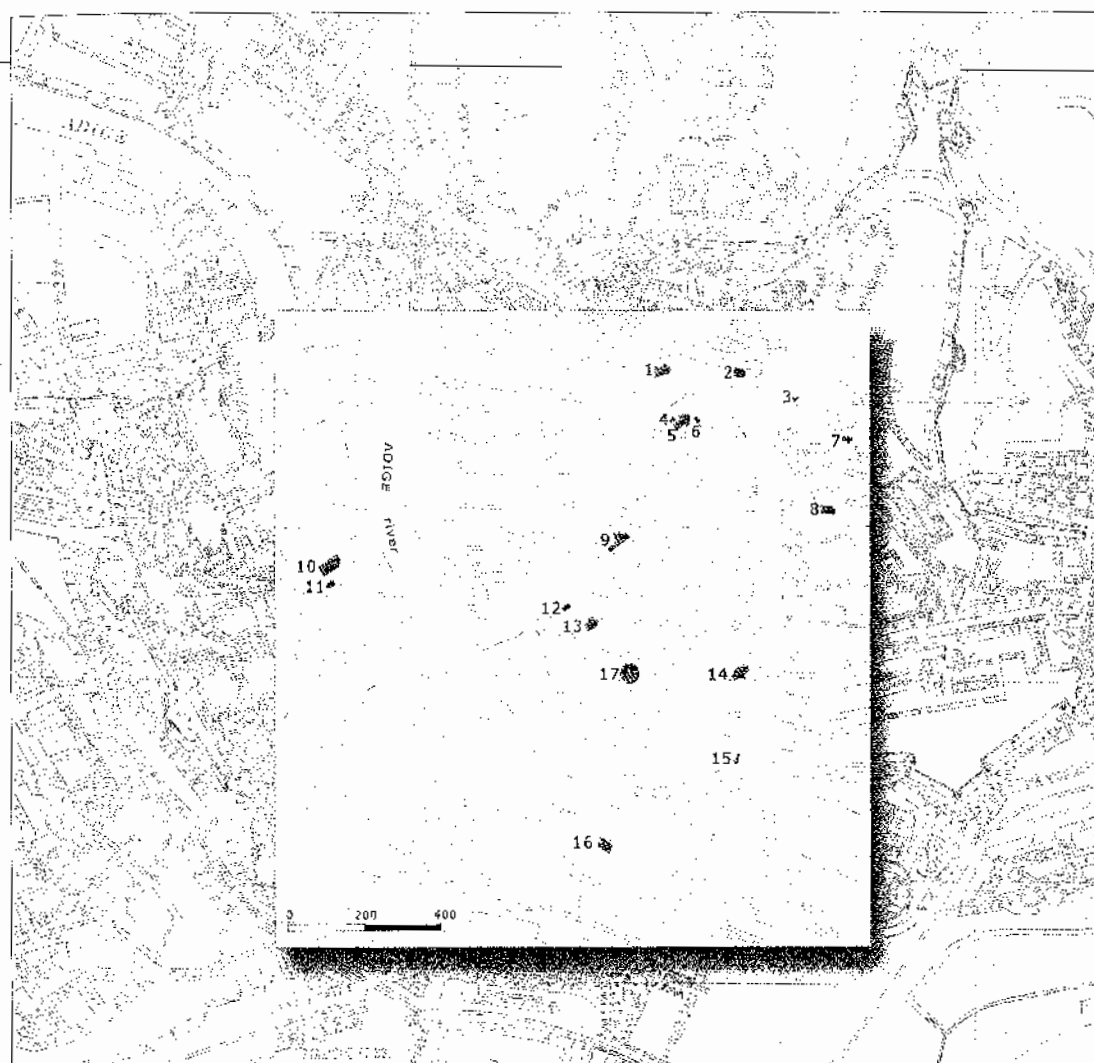
Sed supradictus vicecomes eius decimam prout solitus erat petere et impedire et quandoque violenter auferre usque ad diem quo civitas Verona terremotu tam grandi exterminata est [...] viso tanto tremore tantoque animi et corporis perturbatione a supradicte ecclesie sacerdote ex parte omnipotentis dei predictus vicecomes rogatus videlicet ut decimam ecclesie supradicte quam multis modis impediens expediret et reffutationem et finem pro dei timore et sue anime remedio [...] die dominica quod est XVIII kalendis februarii anno ab incarnatione domini MCXVII indicione X iuxta

ecclesiam S.Johannis Baptiste in presencia supradictorum hominum Rodulfus vicecomes fecit hoc bonum.

Ten years after the earthquake, in 1127, Bishop Bernardo of Verona, took action to have the church of S.Giorgio in Braida rebuilt (Archivio Segreto Vaticano, *Cancellaria della Nunziatura Veneta*, San Giorgio in Braida, 30, 1, no.6886):

"I, Bernardo, the unworthy bishop of the people of Verona, for the love of God and the salvation of my soul, have arranged to restore and refurbish the church of God and of San Giorgio in Braida [...] which recently suffered spiritual and material destruction. [...] Drawn up outside the doors of the church of San Zeno the Confessor, in the year of our Lord 1127, in the 5th indiction".

Ego Bernardus indignus veronensium tamen episcopus ecclesiam dei et sancti Georgii in Braida [...] tam in spiritualibus quam in temporalibus in ultimo destructam ob dei amorem et anime mee redemptionem restaurare et ordinare disposui et proposui. [...]. Actum ante ianuas ecc. S.Zenonis confessori anno dominicæ incarnationis MCXXVII, Indictione V.



VERONA
monuments damaged
by the earthquake
of 3 January 1117

Churches

1. S.Giorgio in Braida
2. S.Stefano
3. S.Pietro in Castello
4. S.Elena
5. Cathedral
6. S.Giovanni in Fonte
7. S.Giovanni in Valle
8. S.Maria in Organo
9. S.Eufemia
10. S.Zeno
11. S.Procolo
12. S.Lorenzo
13. Ss.Apostoli
14. S.Fermo Maggiore
15. S.Fermo Minore in Braida
16. SS.Trinità

Roman amphitheatre

17. Arena

fig. 16 Verona, the 12th century urban area shown enlarged in the square against the background of the present-day city: location of the buildings damaged by the earthquake on 3 January 1117.

The earliest local annals are the *Annales S.Trinitatis Veronenses* (p.2), compiled from the second quarter of the 12th century onwards:

"In the year 1117 since the Incarnation of Our Lord Jesus Christ [...]. In that year many towers and countless buildings collapsed in the earthquake in Longobardia and other lands".

Anno ab incarnatione domini nostri Iesu Christi 1117 [...]. Hoc anno multe turres et innumerabilia edificia propter terre motum per Longobardiam et alias terras corruerunt.

The *Annales Veronenses Breves* (p.2), which derive from old Verona cathedral annals, are extremely brief on the subject:

"1117. – There was a great earthquake".

1117. – Fuit terre motus magnus.

There are a few more items of information in the later *Annales Veronenses antiqui* and in the *Annales Veteres*, both of which were compiled in the second half of the 13th century.

The *Annales Veronenses antiqui* (pp.31-2) record:

"In the year 1117 since the Incarnation of Our Lord Jesus Christ, in the tenth indiction, on the second day before the Ides of January [12 January], this church was consecrated in honour of the Holy Trinity and the Blessed Virgin Mary and All Saints. In that year, many towers and countless buildings collapsed in Longobardia and other lands.

There was a very great earthquake, in which a large part of the Arena also collapsed".

Anno ab incarnatione domini nostri Ihesu Christi .M.C.XVII., indictione decima, .II. iduum ianuarii, consecratum est hoc templum in honore [sic] sancte Trinitatis et beate Marie semper Virginis et omnium Sanctorum. hoc anno multes turres et innumerabilia edificia propter terremotum per Longobardiam et alias terras corruerunt. Terremotus maximus fuit, in quo etiam magnam pars Arene cecidit.

In the *Annales Veteres* (p.89), the earthquake is wrongly dated to 7 January:

"On 7 January [1117], there was a great earthquake, which caused a large part of the Arena [at Verona] to collapse".

Fuit magnus terremotus unde maxima pars arene cecidit die septimo intrante Januario.

Greater detail is provided in the account by Peter the Deacon, who was born in 1107, and compiled a continuation of the Montecassino monastery chronicle (pp.524-5). His plain narrative seems to show signs of an awareness that more than one earthquake had occurred:

"January 1117. Also at this time, there were great earthquakes almost throughout Italy [...].

At that time, most buildings collapsed in the town of Verona as well, and great cracks appeared in those parts, and many trees with rich foliage were uprooted and thrown out of the ground, and those places were covered in smoke; and a baby spoke, in spite of its age, and foretold certain prodigies, which subsequently occurred".

Jan. 1117. Hoc preterea tempore terremotus magni per universam fere Italiam facti sunt [...].

Tunc quoque in civitate Veronensi maxima pars edificiorum corruit, yatus etiam in eisdem partibus magni facti sunt, et innumere arbores virentibus foliis radicitus evulse foras eiecte sunt fumoque loca illa obtecta; infans etiam contra etatem locutus quedam portentosa vaticinatus est, que postea evenerunt.

Guido Pisano (Biblioteca Apostolica Vaticana, *Vaticanus Latinus* 11564, fol.184), is

another contemporary writer who refers to serious effects in the town of Verona:
"In the town of Verona, the amphitheatre, which the inhabitants call the Arena, was destroyed, along with nearly all the other buildings.

In Veronensi urbe amphiteatrum, quod incole Arenam vocabant, et cuncta fere edificia diruta sunt.

The town of Verona is specifically mentioned in the *Annales Mediolanenses breves*, a chronicle compiled about 1228 (p.390):

"1117 – There was a great earthquake on the third day of January. Buildings were shaken at Verona, and the town collapsed [...]"

1117. – Factus est terrae motus magnus tertio die Ianuarii. Verona civitas concussis aedificiis corruit [...].

The *Annales Hildesheimenses* (p.64) — a chronicle whose source for 12th century events is the now lost *Annales Patherbrunnenses* — record in addition that the river Adige was blocked by landslides from neighbouring mountains:

"1117 – On the eighth day after the feast of St. John the Evangelist [3 January], far and wide across the world, the earth was shaken by a terrible earthquake, such as had never been heard of before. But especially in Italy, this menacing peril raged continuously for many days [...].

At Verona, a splendid Italian city, buildings were shaken, many people were buried, and the city was reduced to ruins".

1117. – In octava sancti Iohannis Euangelistae late per orbem terribili et inaudito hactenus terremotu terra concutitur. Maxime vero in Ytalia minax hoc periculum per multos dies continue deseuit [...].

Verona, civitas Italiae nobilissima, edificii concussis, multis quoque mortalibus obrutis, corruit.

Ronco all'Adige (Verona)

The church of S. Maria was badly damaged, large parts of it collapsing. The church had been built in 929, and was rebuilt in 1127 by Bishop Bernardo of Verona.

According to a regest published in *Italia Pontificia* (ed. Kehr, vol.7/1, p.301):

"In the year 929, the royal vassal Milo built and endowed the church of S. Maria at a place called Ronco [Ronco all'Adige], placing it under the metropolitan church of Verona. It collapsed in 1117 in the earthquake, but was completely rebuilt, and in 1127 took its privilege from Bishop Bernardo of Verona".

Ecclesiam s. Mariae in loco qui vocant Runco Milo vassus regius anno 929 aedificavit et dotavit, subiciens eam canonicae ecclesiae maioris Veronensis. Anno 1117 terrae motus eversa, sed denuo instaurata, anno 1127 a Bernardo episcopo Veronensi privilegium accepit.

Cremona

Our only information about damage concerns the cathedral, where the apse area collapsed. Construction of the church had begun in 1107, and since it was still being built at the time of the earthquake, it is possible that the collapse of wooden scaffolding and the only completed part of the masonry structure (the apse) gave the impression of total destruction which the annal sources record.

In 1129, fresh restoration and rebuilding work was started (Porter 1917).

The sources are: the *Annales Cremonenses* (p.3), compiled from the third quarter of the 12th century onwards, and a *Supplementum* (p.185) published as an appendix to the *Annales Cremonenses*, both of which are based on old local annals, now lost. These lost

annals were probably used by Sicard, bishop of Cremona from 1185 to 1215, in his *Cronica*. Both the *Annales* and the *Supplementum* date the earthquake to 1116, because they adopt the Incarnation dating style.

Unlike almost all the other northern Italian chronicles, the *Annales Cremonenses* mention the time when the earthquake occurred:

“When the earthquake occurred, in 1116, on the eighth day after the feast of St. John the Evangelist [3 January], at the hour of vespers”.

Quando fuit terre motus, MCXVI. in octava sancti Iohannis evangeliste, hora vesperarum.

It is in the *Supplementum* that the collapse of the cathedral is recorded:

“In the year of Our Lord 1116 [for 1117], in the 10th indiction, on the 3rd day before the Nones of January [3 January]. There was a great earthquake, which caused the cathedral church of Cremona to collapse, and the body of the confessor Imerio lay for a long time in the ruins”.

Anno Domini MCXVI, indictione X, III Nonarum Ianuaris Terremotus magnus fuit, propter quem maior Cremonensis ecclesia corruit, et corpus confessoris Ymerii diu latuit sub ruina.

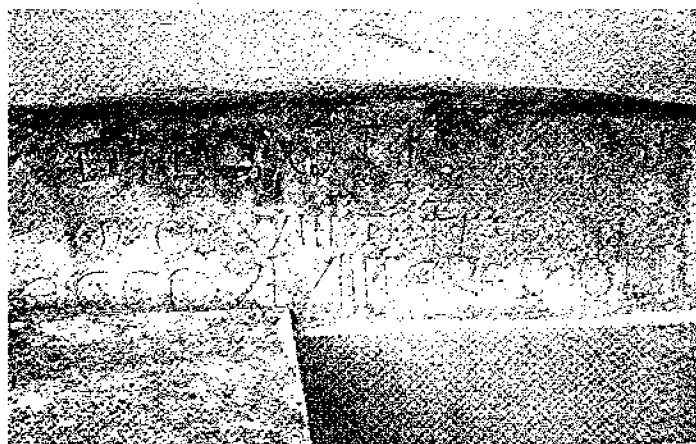
The same text also appears in the *Cronica* of Sicard of Cremona.

Costozza (Vicenza)

There is an inscription at the foot of the bell-tower at the church of S.Mauro, possibly dating to the 14th century, which records the date of this earthquake, as well of the earthquakes of 1222 and 1348. It is reasonable to suppose that the reference is to damage to the bell-tower itself, for it can be seen to have gone through various stages of construction:

“Earthquakes 1117 [...]”.

Terremoti MCXVII [...].



figg. 17 and 18 Costozza (Vicenza), left: bell-tower of the church of S.Mauro; above: inscription on the bell-tower. The earthquakes of 1117, 1222 and 1348 are explicitly recorded. The plaster now in place has covered over the masonry of the various stages of reconstruction and repair of the bell-tower.

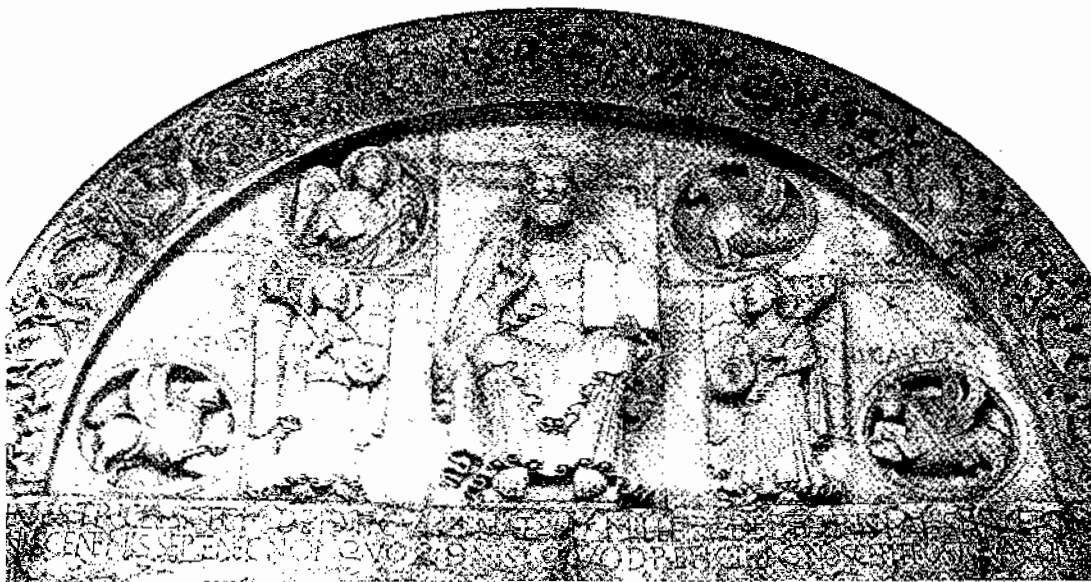


fig. 19 Abbey of Nonantola, church of S.Silvestro: on the architrave of the entrance portal a long inscription is engraved recalling the collapse of the elevated parts of the building (perhaps the wooden trusses) resulting from the earthquake on 3 January 1117.

Nonantola (Modena)

The abbey church of S.Silvestro was damaged: the wooden roof trusses probably collapsed. The source is an inscription on the architrave at the entrance which records the collapse of the upper parts of the building and the commencement of rebuilding four years later (see fig. 19)

"The top of the church of the great Sylvester collapsed after the revolutions of the sun had registered one thousand one hundred and seventeen years since the birth of the Redeemer, and the rebuilding of the church was begun four years later".

*Silvestri celsi ceci derunt culmina templi mille redemptoris lapsis vertigine solis
anni centenis septem nec non quoque denis quod refici magnos cepit post quatuor annos.*

A recent examination of the records of restoration work at this church (Serchia *et al.* 1984) has suggested that some other parts of the building may also have collapsed.

Padua

There is evidence of damage to the cathedral and the basilica of S.Giustina.

A large part of the wooden ceiling collapsed in the cathedral church of S.Maria Assunta (according to Bellinati 1977).

The source is an inscription, now lost, on the architrave in the middle of the church, which stated that reconstruction work under the direction of an architect named Macillo was completed in 1124. In accordance with medieval epigraphic convention, the building recounted its own collapse and reconstruction in the first person.

The inscription read:

"First the earthquake caused me to collapse completely, but Macillo raised me from the mud in beautiful form. In the year of our Lord 1124, in the 2nd indiction, Macillo built me up from the mud".

*Me terre primo motus subvertit ab ymo
sed Macilli limo pulchre me struxit ab ymo
Anno Domini MCXXII indicione II
arte magistrati Macili construxit ab ymo.*

The basilica of S.Giustina was so badly damaged that it had to be replaced by a new building.

There is an unpublished 18th century manuscript entitled *Cronaca di Padova dalla sua origine al 1406* (Biblioteca Civica, Padua, *Manoscritti*, B.P.119.1/2) containing a transcription of a lost 12th century text by a contemporary monk called Redorneto, which refers to the collapse of the basilica:

"In our time (in the year 1117), a very powerful earthquake shock completely destroyed the basilica and obliged us to replace it with another somewhat different one. The latter was supported on marble columns and largely decorated with marble slabs, and its interior shone like the stars in the sky".

Basilicam nostro tempore (curi anno 1117) vehemens terremotus quassatio funditus diruit et aliam nos in locum eius non bene consimilem substituere coegit illa numque marmoreis suffulta colupnis et in magne parte marmoreis tabulis ornata et decorata celestium interius siderum radiabat ad instar.

For effects at Padua, see also Guidoboni *et al.* (1997, p.147).

Parma

The earthquake is described in contemporary sources as *maximus* (very great). It is recorded that a large part of the cathedral of S.Maria Maggiore collapsed. Architectural investigations carried out by Quintavalle (1974) have rejected suggestions of a total collapse, however, showing that damage at the cathedral was confined to the cupola.

The sources consist of brief local chronicles, the 12th century *Annales Parmenses minores* (p.662), the *Annales Hildesheimenses* and the *Annales Mediolanenses breves* (p.390), compiled around 1228. The earthquake is also mentioned in the *Chronicon Parmense*, written by an unknown author who lived between 1270 and 1340 approximately.

In the *Annales Parmenses minores*, the earthquake is dated to 3 January 1104, but the collapse of the cathedral is given as having occurred in 1117:

"In 1104. On the third day of the month of January, there was a very great earthquake in this realm, and most of the church of S.Maria [in Parma] was destroyed in 1117".

In 1104. Tercio die mensis Ianuarii tere motus fuit maximus in hoc regno; et maxima pars ecclesie sancte Marie dirupta fuit in 1117.

In the *Chronicon Parmense* (pp.3-4), we find the same information as in the previous chronicle, plus a generic reference to the earthquake under the year 1116:

"In 1116, there was a very great earthquake, lasting for thirty days, on the eighth day after the feast of St.John the Evangelist, the third day of the month of January".

In millesimo CXVJ fuit maximum terremotus per triginta dies in octava sancti Johannis Evangeliste, tertio die intrantis mensis januarij.

The brief reports in these Parma sources seem to be referring to two separate earthquakes. However, as Quintavalle (1974) has shown, if there was indeed an earthquake in 1104 as well, it cannot have been of any considerable intensity, or at least not such as to cause damage to the cathedral, for services were being held there regularly in 1104 and 1105. Information about Parma in the *Annales Mediolanenses breves* is expressed in more general terms (p.390):

"1117 - There was a great earthquake on the third day of January. Buildings in Verona were shaken and the town collapsed in ruins, and the same thing happened at Parma and Venice, and in other towns and castles".

1117. - Factus est terrae motus magnus tertio die Ianuarii. Verona civitas concussis aedificiis corruit, similiter Parma et Venetiis, aliisque civitatibus et castellis.

In the *Annales Hildesheimenses* (p.64), Parma is named as one of the Italian towns struck by the earthquake:

"On the eighth day after the feast of St. John the Evangelist [3 January], far and wide across the world, the earth was shaken by a terrible earthquake, such as had never been heard of before. But especially in Italy, this menacing peril raged continuously for many days [...] at Parma [...] and in other towns, villages and castles, many thousands of people perished.

1117. *In octava sancti Iohannis Euangelistae late per orbem terribili et inaudito hacenus terremotu terra concutitur. Maxime vero in Ytalia minax hoc periculum per multos dies continue deseuit [...] in Parma [...] aliisque urbibus, oppidis et castellis non pauca hominum milia interierunt.*

Piacenza

There is no documentary evidence that the old cathedral of S. Giustina completely collapsed, or even suffered damage. The inscription recording the foundation of the 1122 church does not prove that the new building was replacing an earlier one which had been destroyed in the earthquake.

The church of S. Antonino may have been damaged. There are various documents, however, which show that the earthquake was an event of such importance within the local collective memory that people used it to organise their personal recollections into pre- and post-earthquake periods. The sources we discovered are preserved in the Archivio Capitolare of Sant'Antonino in Piacenza, and consist of two notes of expenditure and eight witness statements in two lawsuits involving the local bishop, the canons of S. Antonino and the commune. In the ledger of income and expenditure of the church of S. Antonino in Piacenza were found two notes of expenditure, which can be dated to 1150-53, for lead and other materials used in repairing the church. But the cause of the damage is not indicated (*Diplomatico*, Atti Privati (ex B.12), nos. 751, 752):

1. "This is the cost [...] for the two places where I had the church roof repaired: for lead and labour, 8 *libre* and 6 *soldi*; [...] and 8 *soldi* for the balconies in the tower of S. Antonino [...]"

Hoc est dispendium [...] in duabus vicibus quod feci cooperire ecclesiam inter plumbum et laboraturam .VIII. libras et .VI. solidos; [...] et .VIII. solidos in balconibus turris Sancti Antonini [...].

2. "This is the cost [...] For the 2550 *libre* of lead for the church roof we paid 5 and a half *libre*, and for the master craftsman who made the lead sheets 25 *soldi*, and for iron and tin and food for the workmen and wood and all the other materials required, 20 *soldi*; for repairing the tower balconies, 9 *soldi* [...]"

Hoc est dispendium [...] In duobus milliariis et dimidio et quinquaginta libras plunbi dedimus .V. libras et dimidiam pro coopertura ecclesie et magistro qui fecit petias de hoc plunbo .XXV. solidos et inter ferrum et stagnum et pasturam manualiorum et ligna que omnia ad hoc operata sunt .XX. solidos, in aptatura de balconis turris. VIII. solidos [...].

The earthquake made a deep impression on the local collective memory, as can be judged from the frequency with which it was used for dating purposes. Three witnesses mention the earthquake in giving evidence in a lawsuit between the bishop and the local council (*Diplomatico*, Atti Privati (ex C.39), no. 1054, no. 1055):

1. "Maldotto Canterello, after taking the oath, states: I remember the earthquake [of 1117] and I saw the women and the bakers making bread for sale at that time without having indicated its weight [...]"

Maldoctus Cantarellus iurato dicit: ego recordor terremotum et videbam mulieres et furnarios facere tunc panem venalem sine penso dato [...].

2. "Fulco dei Landi, after taking the oath, states: I remember the earthquake [of 1117] and I heard [...] that count Alberto came to 'Potriciano' for the matter of the committee [...]."

Fulco de Andito iurato dicit. Ego recordor terremotum et audivi [...] quod comes Albertus venit Potricianum pro facto comitatus [...].

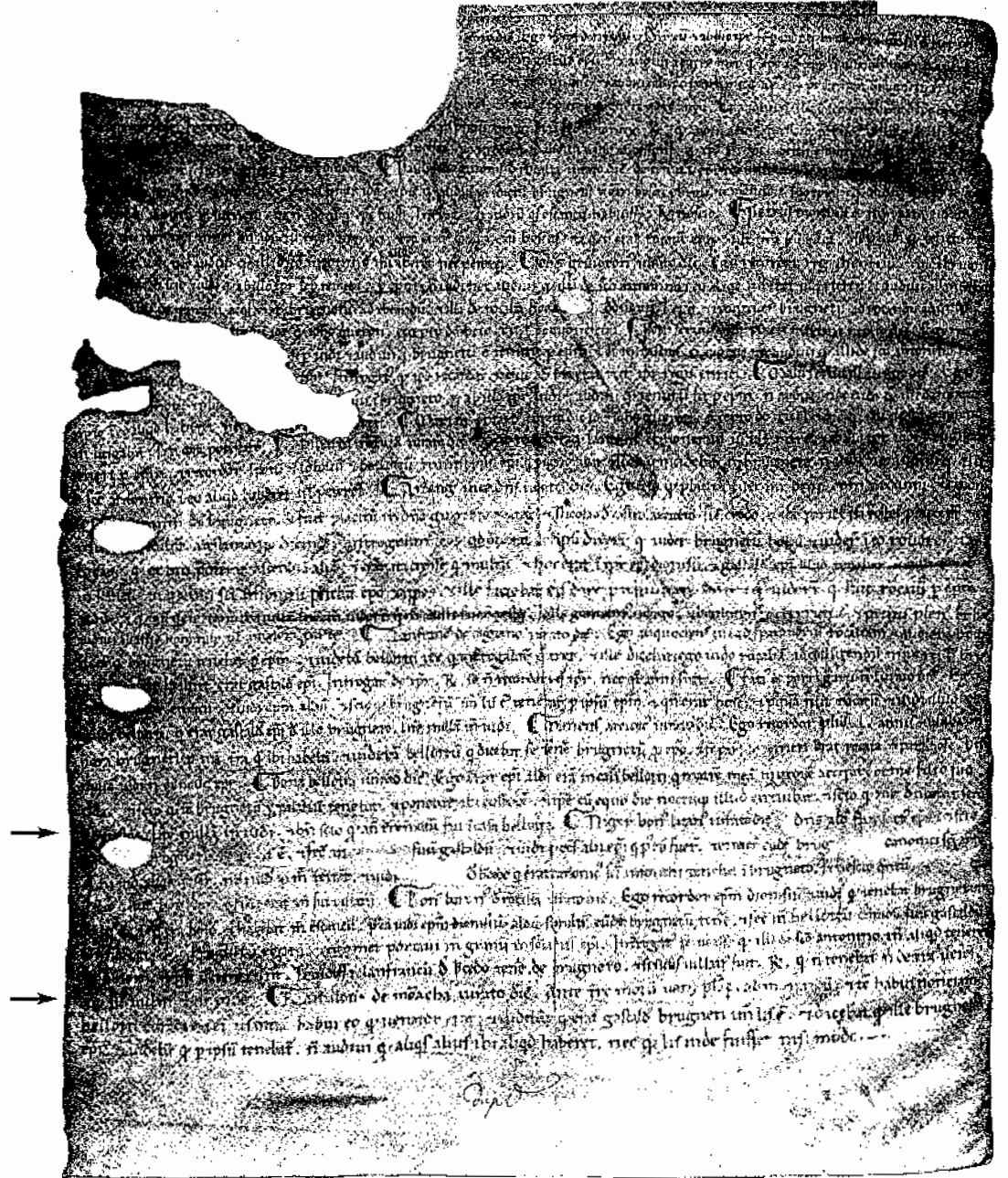


fig. 20 Twelfth century parchment: a legal action. The 1117 earthquake is recalled by the witnesses as the chronological deadline before which the contested estate belonged to the Bishop of Piacenza (see transcription in the text; Archivio Capitolare di S. Antonino, Piacenza, *Diplomatico, Atti Privati, ex C.39, no.1055*; the arrows indicate references to the earthquake).

3. "Malviso dei Landi, after taking the oath, states: I remember the earthquake [of 1117] and I saw the women making bread for sale and I think it was not weighed [...]"

Malus Visus de Andito iurato dicit. Ego recordor terremotum et videbam mulieres facere panem venalem et credo sine penso [...].

The earthquake reappears for dating purposes in a lawsuit between the bishop of Piacenza and the canons of Sant'Antonino over a property at Brugneto, a place near Roncaglia. A number of witnesses were questioned. Amongst those who gave evidence in support of the bishop, three testified as follows (*Diplomatico*, Atti Privati (ex C.39), no.1073):

4. "Malservizio, after taking the oath, states: I remember the earthquake and beyond, but after the earthquake I was at Brugneto, and from that time onwards, I always saw and heard that it was held by the bishop".

Malumservitium iurato dicit: Ego recordor Terremotum et plus, sed a terremoto usavi in Brugneto, et ab illo tempore semper vidi et audivi, quod tenutum sit per episcopum.

5. "Bona Bellotta, after taking the oath, states: at the time of Bishop Aldo [i.e. 1096-1121], I was in Bellotto's house [Bellotto was the bishop of Piacenza's steward], for he had married my mother and treated me as his son [...] But I saw no quarrel, and I am perfectly sure of this, for I was at Bellotto's house before the earthquake [...]"

Bona Bellotta iurata dicit: Ego in tempore episcopi Aldi eram in casa Bellotti, qui matrem meam in uxorem acceperat, et me filio suo [...] Litem nullam inde vidi, et bene scio, quod ante terremotum fui in casa Bellotti [...].

6. "Rinaldo de Monacha, after taking the oath, states: before the earthquake I came to live in Piacenza and that was when I heard of Corrado Bellotto [...] And I used to see the steward of Brugneto that the dispute is about, and he used to say that Brugneto was the bishop's, and I could see that it was held by the bishop".

Rainaldus de Monacha, iurato dicit: Ante terremotum veni Placentiam ad morandum et tunc habui noticiam Bellotti Curadi [...] Et videbam quod gastaldus Brugneti, unde lis est, et dicebat, quod ille Brugnetus erat episcopi, et videbam, quod per episcopum tenebatur.

Finally, in a dispute between these same canons of S.Antonino and some private individuals, two witnesses made the following statements (*Diplomatico*, Atti Privati (ex D.39), no.606):

7. "Giovanni of 'Vico Barono', who lives at the Rivalgaro bridge, after taking the oath, states: I am well aware and remember that before the earthquake Guido and Manfredo of Rivalgaro acquired land at Carrata [...]"

Johannis de Vico Barono qui stat ad pontem de Rivalgario iurato dicit: bene scio et recordor quod ante terremotum Guido et Manfredus de Rivalgario adquisierunt terram in Carrata [...].

8. "Bonbello, after taking the oath, states: I am well aware that, before the earthquake, I and Gualengo, son of Gualengo, and Donodei and Rodolfo, who was then an elderly man, were at the manor of Gualengo [...]"

Bonbellus iurato dicit: bene scio quod ante terremotum ego et Gualengus filius Gualengi et Donumdei et Rodulfus qui tunc erat vetus homo eram in curte Gualengi [...].

Serle and its territory (Brescia)

The earthquake was used for dating purposes when some disputes arose between the abbots of the monastery of S.Pietro in Monte Ursino and some property owners. Five documents dating to the second half of the 12th century contain statements by seven

witnesses who refer to the earthquake (Barbieri and Cau 2000, docs. no.74, no.85, no.86, no.97 and no.114, digital publication edited by Michele Ansani).

In a dispute between Abbot Benedetto and two brothers, two witnesses refer to the earthquake. The document (no.74) dates to before 29 December 1163:

1. "Guido of Lurcina, after taking the oath, bears witness: [...] he says that he together with his father after the time of the earthquake, as well as without his father, cut and hewed wood during this dispute, and that he saw his neighbours doing likewise and cutting hay, while they were in sight of the men of Serle who made no objection, except nine or ten years (since)".

Guido de Lurcina iuratus testatur [...] dicit se cum patre suo a tempore terremotus et absque patre taliase et buscase in hac lite et vidisse vicinos suos idem facere et fenum secare, hominibus de Serle videntibus et non contradicentibus, nisi ad .x. annis vel novem.

2. "Grimoldo of Marcuzo, after taking the oath, testifies that, as far as he remembers, that is to say since (the time of the) earthquake, he has seen the men of Lurcina pursuing this dispute with the men of Grumetello [...]"

Grimoldus de Marchuzo iuratus testatur a sua recordantia que est a terremotu vidisse homines de Lurcina tenere hanc litem per illos de Grumethello [...].

The earthquake is also recalled by two witnesses in a dispute between the *sindaco* (a sort of bailiff) of Abbot Alberto and the men of Serle, and the *sindaco* of the men of Nuvolera, about rights over Monte Dragone claimed by the parties. This dispute is to be found in two documents (no.85, parchment 2673 and no.86, parchment 2675), both of which are dated Brescia 6 July 1175:

3. "Alberto Conto, a lay brother of S.Pietro in Monte, after taking the oath, testifies that he was born before the earthquake, and says that he remembers that for the last 40 years he has seen outsiders appointed by the monastery and the people of Serle to look after the Dragone wood as far as Patengola [...]"

Albertus Contus conversus Sancti Petri in Monte iuratus testatur se natum fuisse ante terremotum et dicit se recordari .XL. annos esse quod vidit forasterios constitui per monasterium et per comune de Serlis ad custodiendam silvam Dravonis usque ad Pathengolas [...].

4. "Bresciano de Braida of Nuvolera, after taking the oath, testifies that, as far as he remembers, that is to say from the time of the earthquake, he, his father and his brother used to go to the Dragone wood through the manor of Nuvolera and the village of Santa Giulia, to make planks [...] and other kinds of wood that they needed [...]"

Brixianus de Braida de Nuvolera iuratus testatur se et patrem suum et fratrem suum usos esse in silva Dravonis per curtem de Nuvolera et terram Sancte Iulie, a sua recordantia, que est a tempore terremotus, faciendo ases [...] et cetera ligna sibi necessaria [...].

Two witnesses also mention the earthquake in a dispute between Abbot Alberto and Guglielmo de Ripa. The document (no.97) is dated Brescia 9 April 1183:

5. "The tonsured lay brother of S.Pietro in Monte, after taking the oath, declares: 'I can remember the last 50 years, since I was born during the earthquake, and I have never seen anyone living on Guglielmo's estate, except for the last four years [...]' "

Tonsus conversus Sancti Petri in Monte iuratus testatur: "Ego recordor de .L. annis quia eram natus per terremotum, nec vidi aliquem habitare supra tenutam Guilielmi nisi a .IIIlor. annis infra [...]"

6. "Alberico, son of Giovanni of Nuvolasi, who is a peasant in the service of 'Barnato', after taking the oath, declares: my memories go back to the earthquake, and ever since then I have heard from my grandfather, my father and my paternal uncle that the land of San Benedetto, which is at the place called Valle, lies within the district of the monastery of S.Pietro in Monte'".

Albericus Iohannis de Novelasiis, que villa est desubtus Barnathum, iuratus testatur: 'Ego recordor a tempore terremotus et ab eo tempore infra audiui ab avo et patre et barbano meo quod terra Sancti Benedicti que est in loco Vallis est de districto monasterii Sancti Petri in Monte'.

Finally, in the dispute between Abbot Alberto and the *sindaco* of the people of Serle about rights claimed by both parties over Monte Dragone, one witness refers to the earthquake and describes it as "greater" (*maior*). The document (no.114) is dated Brescia 30 June 1186:

7. "Giovanni Nigro of Nuvolento, after taking the oath, declares: I say that my memory goes as far back as the greater earthquake, and ever since that time I have always seen the monastery of S.Pietro in Monte and the abbots of the monastery, where I have seen 5 changes of abbot, and I have seen that the people of the monastery held, occupied and possessed Monte Dragone [...]".

Iohannes Niger de Nuvolento iuratus testatur: 'Dico quod recordor de teramotu maiori, et ab eo tempore infra semper vidi monasterium Sancti Petri in Monte et abates illius monasterii, in quo visos habeo .V. abates, et illos de monasterio habere et tenere et possidere montem Dravonum [...]'.

Milan

The earthquake at Milan is described by contemporary sources as "very powerful" (*ingens*). One early 13th century chronicler records the collapse of a tower.

As a result of a careful examination of restoration work at the basilica of S.Lorenzo Maggiore, Cecchi (1994) has produced some new and interesting hypotheses. In his opinion, this late antique building was seriously damaged in the earthquake. An examination of its structure leads him to believe that the south-east tower was so seriously damaged that it had to be rebuilt; that the south-west and north-west towers lost their tops; and that the north-east tower was badly damaged but remained almost entirely standing. In addition, the atrium of the chapel of S.Aquilino was very probably damaged, as a result of the collapse of the nearby towers, if for no other reason. The perimeter walls were very badly damaged, though not irreparably; and the dome was in all probability badly damaged and in a precarious state.

Cecchi (1994) also believes that restoration work went on into the mid-12th century, the windows being closed off and the load being distributed over cross vaulting. The complex and delicate restoration work involved superimposing on the damaged building an independent load-bearing architectural structure which was inserted into the existing stonework.

Amongst local sources, the *Notae Sanctae Mariae Mediolanenses* (p.385) contain contemporary notes written in a Milan cathedral calendar, which specifically refer to the city and its territory:

"On the third day before the Nones of January [3 January], in the year 1117 since the Incarnation of the Lord, there was a very powerful earthquake in this city [Milan] and throughout our province".

3. *Nonas Ianuari anno dominicae incarnationis 1117. factus est ingens terre motus huic civitati universaeque nostrae provinciae.*

The *Annales Mediolanenses brevissimi* (p.391), unlike almost all the other northern

Italian chronicles, include a reference to the time of day when the earthquake occurred: "1117. On the third day of the month of January, in the 10th indiction, a Wednesday, at the hour of vespers, there was a very great earthquake, such as had never been seen before".

1117. 3. Die mensis Ianuarii, indictione 10, die Mercurii, in hora vespera fuit terre motus maximus, qui antea non erat visus.

Another contemporary source is the *Historia Mediolanensis* (p.27) by Landulf the Younger, a cleric who belonged to the entourage of the archbishops of the Milanese church. He was an eye-witness, and while his account of effects in Milan is couched in very general terms, it conveys the atmosphere of panic amongst the people very well: "And in addition, the earthquake, which shook and deeply disturbed the realm of the Lombards while the excommunication was still in operation, caused me to be much on my guard. At that time, people had seen great destruction in towns and other places, affecting churches in particular, and they said that drops of blood had fallen from the sky like rain, and that they had seen monstrous births and many other prodigies in air and water, on mountains and in plains and woods, and that they had heard subterranean thunder. And in this divine trial, even those who were seen to be priests knew not where to flee".

Magnum quoque terre motus, qui vigilante ista excommunicatione, regnum Longobardorum penitus commovit et quassavit, me nimirum vigilem fecit. In eo quippe tempore gentes, que viderant magnas ruinas per civitates et quelibet loca, presertim per ecclesias, proferebant, gutas sanguinis ad modum pluvie de cello descendisse, monstruosus partus et allia multa prodigia in aere, in aquis, montibus, planitiis silvisque vidisse, et subterranea tonitrua audisse. Et in hac divina visitatione etiam hii, qui videbantur esse sacerdotes, ignorabant, quo fugerent.

The earthquake is also recorded, though often in general terms and without any details, in 13th century local annals, based on sources now lost. The annals in question are: the *Annales Mediolanenses breves*, compiled about 1228; the *Memoriae Mediolanenses*; the *Annales Mediolanenses (S.Eustorgii) minores*; and the *Notae S.Georgii Mediolanenses*. The last of these sources puts the earthquake in 1216, but gives the date as 3 January, so we are probably looking at an error of transcription by the copyist (1216 for 1116: the year given, for example, by the *Memoriae Mediolanenses*).

The collapse of a tower in Milan is recorded solely by Abbot Ralph of the Cistercian monastery of Coggeshall (in the diocese of London) at the beginning of the 13th century. He had probably heard about this through an indirect oral tradition, and describes it as though it were a miraculous event. But what he has to say may be a distorted echo of the collapse of a tower in the Augsburg area, as recorded in the chronicle compiled around 1137-38 by Abbot Berthold of the Benedictine monastery of Zwiefalten. Abbot Ralph's text also mentions a great landslide or movement of surface layers of earth, but its location cannot be identified:

"1117. In Longobardia, there was so great an earthquake for 40 days that many houses collapsed, and one very large town was moved from its normal site and discovered in a far off place. In Milan, while men of patrician rank were discussing public affairs at the foot of a tower, they all heard a voice calling on one of them by name to come out. Since this person lingered, someone appeared before him and persuaded him to come out. When he had gone out, the tower suddenly collapsed, killing all those who were unlucky enough to be inside".

1117. Apud Longobardiam terre motus magnus factus est per dies 40, ita ut domus plurime corruerent, et villa quedam pregrandis mota est repente de statu proprio

iamque in longe remoto consistere cernitur loco. Mediolanis dum patritie dignitatis viri de re publica tractantes sub una residerent turri, auribus omnium vox foras insonuit, unum ex illis vocans nomine et festinato exire rogans. Quo tardante, persona quedam coram apparuit, que vocatum virum ut egrederetur prece obtinuit. Exeunte autem illo, turris repente cecidit et omnes qui ibi aderant casu miserabili oppressit.

San Faustino (near Rubiera, Reggio Emilia)

By tentatively using metrical deductions to fill the gaps in a defective inscription (Montorsi 1977; Artioli 1980), now in the *Lapidario Estense* in Modena and thought to come from the church of Ss.Faustino e Giovita, we produce a text which seems to suggest that the building was restored in late 1117:

"The whole church in every part was founded [when] the year 1117 of the Word Incarnate was approaching its end".

*[cir]cum fundatum temp[us] fuit undique totum
ver]bi carnati currebat cir[citer] finem
m]ilenus denus centenu[s] septimus annus]*

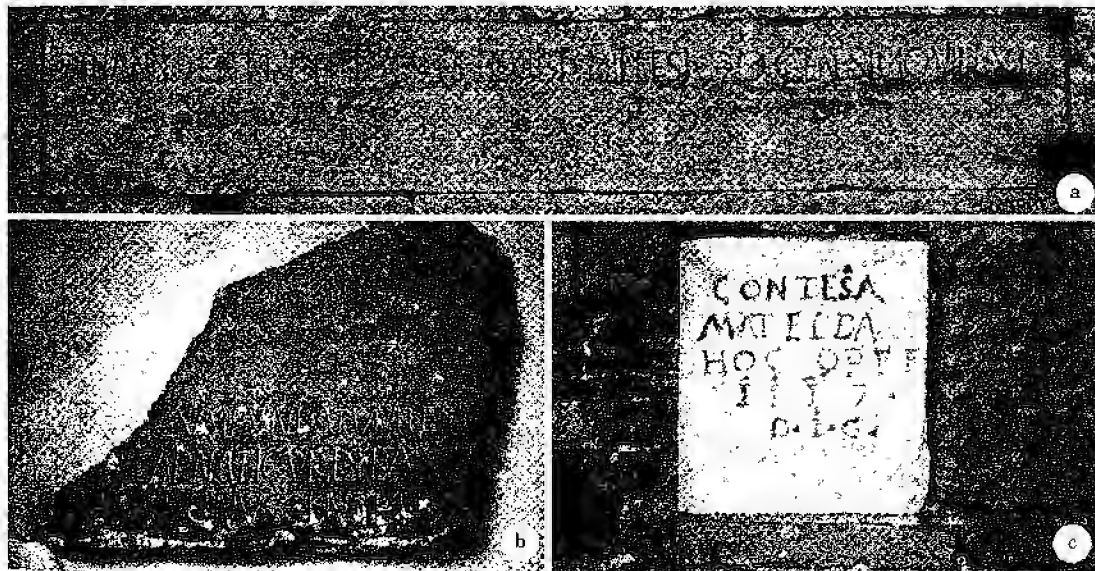
Ferrara

The earthquake is described as "very great".

The source is the *Annales Ferrarienses* (p.663), a series of brief 12th and early 13th century local annals. The Incarnation dating style is used:

"In 1116, there was a very great earthquake for thirty days, on the eighth day after the feast of St.John the Evangelist, on the third day of the month of January".

In 1116. fuit maximus terre motus per triginta dies, in octava sancti Iohannis evangeliste, tertio die intrantis mensis Ianuarii.



figg. 21a, b and c Inscriptions commemorating the rebuilding or reconsecration of the buildings in the years after 1117. (a) Villanova (province of Verona), Abbey: inscription at the base of the bell-tower commemorating reconsecration in 1131. (b) San Faustino (near Rubiera, Reggio Emilia), church of Ss.Faustino e Giovita: the text of the inscription (the missing parts have been restored by applying the rules of metrics), commemorates the reconstruction of the building at the end of the year 1117 (Modena, *Lapidario Estense*). (c) San Pietro di Legnago (province of Verona), church of S.Salvaro: post-12th century inscription in the north aisle dedicating the building to Matilda of Canossa in the year 1117.

Faenza

The cathedral bell-tower and the cathedral itself were both damaged. This item of information is to be treated with caution, however, because of a problem of chronology in the source which records the earthquake. The source in question is the *Chronicon Faventinum* of Tolosano, who was a canon of Faenza cathedral at the end of the 12th and the beginning of the 13th century.

The earthquake is recorded at the year 1142 (*MCXLII*), but Alexandre (1990, p.103) has suggested that it may really be that of 1117. It is indeed possible that the copyist made a simple error in transcribing the year, for by changing the one letter "L" to "V" we obtain 1117 (*MCXVII*). The six codices which form the manuscript tradition of Tolosano's work are all defective, and sometimes rather inaccurate. The earliest is a late 13th century copy, while the others are much later, having been transcribed between the early 16th and mid-18th century (Andreolli *et al.* 1991). Tolosano writes:

"In the year of the Incarnation of our Lord 1142, there was a very great earthquake in Italy, because of which many mountains were split open, many castles were destroyed and the bell-tower of the church of Faenza was damaged, along with the church itself".

Anno ab incarnatione Domini MCXLII, in Italia maximus fuit terremotus, quo scissi sunt montes quam plurimi, diruta castra, et campanile ecclesie Faventine crepuit cum ipsa ecclesia.

The bell-tower was that of the old cathedral, and was demolished in 1515.

Brescia

The earthquake is recorded as "great". The sources are two extremely laconic 13th century local annals, based on earlier annals, now lost.

The *Annales Brixianenses* ("Codex A", p.812) were compiled at the abbey of S.Giovanni at Brescia:

"In the year of our Lord 1117. There was an earthquake in that year".

Anno Domini nostri 1117. Hoc anno terremotus factus est.

The *Annales Brixianenses* ("Codex B", p.812), compiled at the abbey of S.Pietro, are even briefer:

"1117. Great earthquake".

1117. Terremotus magnus.

Monza

The earthquake is recorded as "great", but no other information is provided.

The source is a church obituary from Monza (published in Frisi 1794, vol.3, p.104), containing various original *Notulae* about earthquakes. The one for the year 1117 records 4 instead of 3 January, probably because an "I" has been dropped, giving "II. Non." instead of "III. Non." (the second day before the Nones of January, instead of the third day):

"On the second day before the Nones of January [4 January] in the year 1117. There was a great earthquake".

die II. Nonas Anno M.C.XVII. Terremotus magnus factus est.

Venice

The earthquake is described as "extremely terrible", but no specific damage in the city is explicitly mentioned, except for fires at two churches, which clearly had nothing to do with the earthquake.

The sources are the *Annales Venetici breves*, a brief 12th century Venetian chronicle,

and the *Annales Hildesheimenses* — a chronicle from Germany whose source, for 12th century events, is the now lost *Annales Patherbrunnenses*.

In the *Annales Venetici breves* (p.71), the earthquake is dated to 1116 through use of the Venetian dating style:

"In the year of our Lord 1116, on the third day of the month of January, in the tenth indiction [1 September 1116 – 31 August 1117], there was an extremely terrible earthquake. It caused the collapse of many churches with their bell-towers, and countless houses and towers and castles and a great many buildings, both old and new; and it also caused mountains and their rocks to collapse in devastation, and in many places the earth opened up and sulphurous waters came forth. On that day, the church of S.Ermagora burned down, as well as that of S.Giovanni Decollato [in Venice], together with many adjacent buildings".

Anno Domini millesimo centesimo sexto decimo, die tercio mensis Ianuarii, indicione decima, terremotus fuit valde terribilis. Unde multe ecclesie cum campanilibus corruerunt, et innumerabiles domos et turres et castra atque antiqua et nova edificia plurima; pro quo etiam montes cum rupibus corruerunt et exiderunt, et terra in multis locis aperta fuit et aquas sulphureas emanabat. Et in illa die combusta fuit ecclesia sancti Hermachore et sancti Iohannis Decollati cum multis earum casis.

In the *Annales Hildesheimenses* (p.64), Venice is named as one of the Italian towns struck by the earthquake:

"1117. On the eighth day after the feast of St.John the Evangelist [3 January], far and wide across the world, the earth was shaken by a terrible earthquake, such as had never been heard of before. But especially in Italy, this menacing peril raged continuously for many days [...] at Venice and in many other towns, villages and castles, many thousands of people perished".

1117. In octava sancti Iohannis Euangelistae late per orbem terribili et inaudito hactenus terremotu terra concutitur. Maxime vero in Ytalia minax hoc periculum per multos dies continue deseuit [...] in Venetia aliisque urbibus, oppidis et castellis non pauca hominum milia interierunt.

Although this last source seems to be referring to the city of Venice, it could actually be making a more general reference to "Venetia", that is to say to the old Roman region which corresponded roughly to the present-day regions of the Veneto, Friuli, the eastern part of Lombardy, and a large part of Trentino Alto Adige. There is confirmation that the term was used in this way in the fact that Romuald of Salerno, a 12th century chronicler, indicates the location of the 1117 earthquake by using the names of certain Late Empire regions, including that of "Venecia".

Montecassino

The monks wrote that hanging lamps in churches swayed. However, it is difficult to establish whether this was a local earthquake effect or simply a matter of reports gathered by the monks. The sources are two chronicles of the famous Benedictine abbey. The 12th-13th century *Annales Casinenses* (p.308) record:

"1117. There were such great earthquakes that many buildings collapsed in various places. People were killed and water became cloudy. Hanging lamps in churches were seen to sway".

1117. Terrae motus magni fuerunt; illa quod multa aedificia per diversa loca corruerunt; homines mortui sunt; aquae turbidatae sunt, lampades ecclesiarum moveri visae sunt.

Peter the Deacon, who was born in 1107 and compiled a continuation of the Montecassino monastery chronicle (pp.524-5), records similar information to that in

the previous chronicle, but it is not possible to establish exactly where the events occurred:

"January 1117 – Also at this time, there were great earthquakes almost throughout Italy, to the extent that the walls of many towns collapsed, churches were reduced to ruins, tall towers fell down and many people were killed; and in addition almost all springs became cloudy and hanging lamps in churches swayed without being blown by the wind".

Januar 1117. Hoc preterea tempore terremotus magni per universam fere Italiam facti sunt, ita quod muri multarum civitatum ruerent, ecclesie a fundamentis subverterentur et excelsae turres demergerentur et multorum hominum strages fierent; fontes etiam fere omnes turbidati sunt et lampades ecclesiarum nullo impellente turbine per aerem movebantur.

Adige Valley (Valle Tridentina)

In the 12th century, this term referred to the valley of the river Adige from Salorno (half way between Trento and Bolzano) to Ceraino, about 30 km north of Verona.

Otto of Freising wrote in his chronicle (p.330) that in his own day earthquake damage was still visible:

"At about this time [1117], a terrible earthquake destroyed villages, churches, villas and a great many mountains, as can still be seen today [around 1143-46] in the *valle Tridentina*".

Circa idem tempus terrae motus horribilis oppida, templa, villas montesque plurimos, sicut usque hodie in valle Tridentina apparet, subvertit.

Otto of Freising does not explicitly date the earthquake. Hofmeister (1912), who edited Otto's chronicle for the *Monumenta Germaniae Historica*, dates the passage to 1117, and places it within a context in which items of information are not in strict chronological order. The report of the earthquake is thus preceded by events which can be dated to 1119, 1118 and 1121. This lack of chronological order may explain how the seismological tradition has come to attribute a variety of dates to Otto's report, in addition to 1117. The earthquake is dated to 1114 by Bonito (1691) and to 1120 by von Hoff (1840), Perrey (1848) and Mallet (1853).

The settlements referred to by Otto as damaged, and perhaps in ruins, may have been castles positioned so as to guard the Adige valley.

In any case, the information provided by Otto must be treated with great caution. For the Brenner route which Otto took at least four times in the period 1141-1146, crosses large areas subject to erosion and landslides, including that known as the *Lavini di Marco* (between Rovereto and Serravalle all'Adige, on the left bank of the river Adige), to which present-day geologists attribute a group of landslides datable overall to about 1300 years ago (Orombelli and Sauro 1988; Sauro and Zampieri 2001).

The particular nature and breadth of this landscape led to the creation of an image of great upheaval in certain 13th and 14th century writers, such as Albertus Magnus (c.1206-1280) and Dante Alighieri (1265-1321). Albertus Magnus (*Meteor.* III, 6) was inclined to explain this impressive geological phenomenon as resulting from erosion caused by the Adige, whereas Dante (*Inferno* XII, 4-9) suggested more than one cause: an earthquake or a landslide (*tremoto o sostegno manco*).

We are entitled to wonder whether Otto thought the *Lavini di Marco* were the effect of a great earthquake. It is of some importance to remember that, under the influence of the views of Augustine and Orosius, Otto interpreted world history as a series of stages in the decadence of man and the world, which would be followed by the arrival of the *Civitas Dei*. His historiographical pessimism led him to see clear signs of this decadence in the subjects of his narrative. The 1117 earthquake, which occurred in a peri-

od of great political tension, and in any case preceded Otto's report by at least 24 years, implicitly became one of these "signs" in his narrative, for the scene of immense environmental damage fitted his vision of the world very well, becoming a representation of universal decay and dissolution.

The legitimate doubt lingers as to whether Ottone had attributed to the 1117 earthquake, already famous in its time, evidence of the landscape due instead to other causes. Finally, we cannot forget that the *Valle tridentina* itself was the location of the destructive earthquake in 1046 (see the chart on p.41): so we cannot exclude the fact that there were still the ruins of many small castles, no longer rebuilt.

Caresana (Vercelli)

There is a 12th century parchment containing a witness statement by a priest called Albino of Torcello, in which reference is made to the fact that he went to live at Caresana "before the earthquake". The unpublished parchment is in the Archivio Capitolare at Vercelli; it is not dated but, according to Ferraris (1988, pp.48, 125 note 194), belongs roughly to the years 1160-1168.

The only certain conclusion to be drawn from this documentary evidence is that the earthquake was an important event in the life of these local communities. Ferraris (1988, pp.48-9, 125 note 195) also thinks Caresana was seriously affected by the earthquake. He takes the view that mention of a "new borgo" of Caresana, in a document of 1137, is a reference to the rebuilding of a part of Caresana which, in his opinion, was destroyed in the 1117 earthquake. But this hypothesis is not supported by the sources.

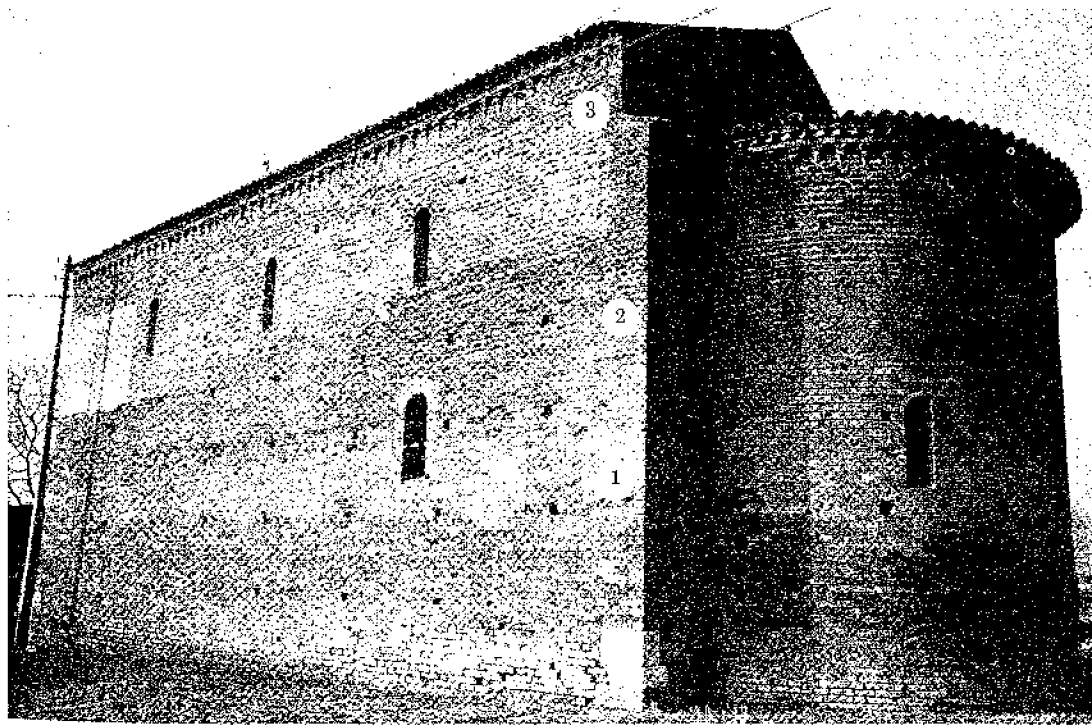


fig. 22 Bevilacqua (Verona), church of S. Pietro in Cantalovo, outside the southern nave. An inscription from 1161 recalls the reconstruction or the restoration of the building. The stratifications evident in the walls of this nave bear witness to that reconstruction: part (1), pre-12th century walls; part (2) can be correlated to the reconstruction of the second half of the 12th century, attested to by the inscription no.18 (sec p.96). Part (3) of the building dates to later on, certainly to the late-medieval period, or the Renaissance period.

Localities included in the damage zone on the basis of architectural and epigraphic evidence (in alphabetical order; see parameters, p.126)

Belfiore (Verona)

An inscription of 1143, now in the Castelvecchio Museum in Verona, records restoration work at the church of S.Michele, also called Madonna di Stra, and gives the names of the builders. The building has some pilasters with Carolingian capitals dating to 775, the lower part of the bell-tower goes back to 1020, and the apses have 11th century masonry facings (Porter 1917; Arslan 1939). The masonry in the apse area is stratified. The upper part is similar to contemporary masonry both in the cathedral and S.Zeno in Verona (post-1117 period), whereas the lower part is attributable to an earlier building which was probably damaged in the earthquake. The building has been much altered in the course of restoration work carried out in the early 20th century.

Bevilacqua (Verona)

An inscription of 1161 on the architrave of the church of S.Pietro in Cantalovo records the reconstruction (or restoration) of the building (D'Arcais 1981a, b). The historian Castagnetti (1976) suggests that the building was in ruins when it was restored. The masonry in the south aisle is stratified: the upper layer is of a late medieval or Renaissance period, whereas the lower part seems to be divided into two bands of different colours, the uppermost probably belonging to reconstruction work in the second half of the 12th century.

Bonavigo (Verona)

The church of S.Maria dates to the first half of the 12th century, but the building has been much altered: the principal apse has been demolished, and the side apses have been incorporated into the thickness of the wall (D'Arcais 1981a, b; Arslan 1943; Tregnaghi 1964).

Carpi (Modena)

The church of S.Maria was founded in the mid-8th century. It has been suggested that rebuilding work carried out in the early decades of the 12th century was necessitated by earthquake damage. The present-day building can be dated to 1120-1130, and was reconsecrated in 1184. The 12th century portal was reinserted into the new façade after the building was partly demolished in the 16th century (Porter 1917; Salvini 1966; Quintavalle 1969; Garuti 1984).

Castell'Arquato (Piacenza)

The church of L'Assunzione was founded in the early medieval period. Salvini (1978) thinks it

was damaged or demolished after the earthquake of 1117, and suggests that when it was rebuilt in 1122, earlier materials were reused. However, he thinks that the building was not undermined by the earthquake, but simply damaged: some parts may have been restored, but without demolishing or reconstructing the whole. The apse may indeed also date to the 11th century (Porter 1917; Nasalli-Rocca 1933; Quintavalle 1969, 1973).

Cerea (Verona)

The historian Bresciani (1957) has conjectured that part of the church of S.Zeno collapsed in 1117. The bell-tower was erected in two stages: at the time of the original construction, and in the mid-12th century. All that remains of the Romanesque building, which was founded at the beginning of the 12th century, are the two apses and two columns near the presbytery. Much of the edifice was probably rebuilt at the beginning of the 14th century, as is suggested by the date (MCCCV) written on frescoes (Arslan 1939; Romanini 1964; D'Arcais 1981).

Cisano (Verona)

The church of S.Maria was probably founded in the early medieval period (c.8th century). Some fragments of the façade are all that remains of the original building. Arslan (1939) has suggested that the church was rebuilt after the 1117 earthquake. The façade and apse are all that remains of the 12th century building, which can be dated to 1120-1130 (Romanini 1964; Zovatto 1964; D'Arcais 1981a, b).

Gazzo Veronese (Verona)

The church of S.Maria Maggiore has been dated on the basis of discoveries made during early 20th century restoration work. Underneath the present building, Da Lisca (1941) discovered the remains of a structure dating to no later than the end of the 11th century. In the wall of the north aisle can be seen a door, now walled up, with a round arch and no architrave. It may perhaps have belonged to the earlier building. Part of the Romanesque decoration consists of an engaged pilaster which is interrupted at that point and so does not reach the ground. This suggests that when the building was restored, surviving earlier structures were preserved: in other words, reconstruction work specifically required salvaging usable parts of the old structure.

There is an inscription of uncertain date, which records rebuilding work at the church of S.Maria Maggiore. It mentions a Lotharius who, according to Porter (1917), is to be identified as the Emperor Lothair (1125-1137). However, Da Lisca (1941) thinks the Lothair referred to is a 9th century figure, which would mean that the inscription had nothing to do with the reconstruction of the building after 1117.

Isola della Scala (Verona)

Of the two inscriptions here, the first dates to 1126 and is on the façade of the parish church of La Bastia (the only Romanesque part of the building), while the second dates to 1130, and is at the foot of the abbey bell-tower (all that remains of the Romanesque building). They suggest that the two buildings underwent restoration (Chiappa 1979; D'Arcais 1981a, b).

Lonato (Brescia)

Recent archaeological and stratigraphic investigations at the parish church of S.Zeno have identified two stages of construction, the second of which begins around the mid-12th century. Although Brogiolo (1990) does not say so explicitly, it seems possible that the apse collapsed or was badly damaged in the 1117 earthquake.

Marcellise (Verona)

The church of La Madonnina was consecrated in the year 1100. Restoration work can be dated to the first half of the 12th century. The only surviving parts of the Romanesque building, namely the north side of the nave and the apse, can be dated to the mid-12th century (Simeoni 1929; Arslan 1943; Romanini 1964).

Pescantina (Verona)

The church of S.Lorenzo was founded in the early medieval period, and art historians have suggested that rebuilding work dating to 1130 is an indication that it had been damaged in the earthquake (Arslan 1943; Vezza 1965).

Piove di Sacco (Padua)

An inscription in the church of S.Martino records the reconsecration of the building in 1129 (Pinton 1891).

San Bonifacio (Verona)

An inscription of 1131 on the bell-tower wall at the Benedictine abbey of S.Pietro Apostolo, in the *frazione* of Villanova, records the restoration of the building. The building itself may go back to the 8th or 9th century. According to Arslan (1939), all the reconstruction work was done on a single occasion, but observation clearly reveals two quite distinct masonry phases (Porter 1917).

San Floriano (Verona)

The church of S.Floriano probably goes back to the early medieval period. Decorative elements described as early medieval can be found in the roof space; the one apse which survives in its entirety is considered to be early medieval; and early medieval materials were used for building.

On a piece of masonry in the façade is written: "A(nno) D(omini) MC". This appears twice in different scripts. The present structure can be dated to rebuilding work in the second or third decade of the 12th century (Arslan 1939; Marchesini 1980).

San Giorgio (Verona)

The church of S.Giorgio was founded before the 11th century, and there were no later building



fig. 23 Isola della Scala (Verona), small church of La Bastia. The inscription placed on the façade recalls the year 1126 as the date of the reconstruction of the building and the names of the craftsmen who did the work (see p.96, inscription no.13).

stages (Porter 1917; Arslan 1939; D'Arcais 1981a, b; De Angelis-d'Ossat 1982). According to Da Lisca (1924), however, the types of mortar used suggest that the apse is of 13th century construction.

San Pietro (near Legnago, in the province of Verona)

There is an inscription bearing the date 1117 at the end of the nave in the church of S.Salvato, near the apses, which seems to suggest that the building was dedicated by Matilda of Canossa (who died in 1115). The inscription is clearly post-12th century. It is a strange coincidence that the date on the inscription coincides with that of the earthquake, because the church is almost unanimously dated to the period immediately after the earthquake (1120-1130). Since the date 1117 appears on the inscription, it must have significance in the history of the church, but

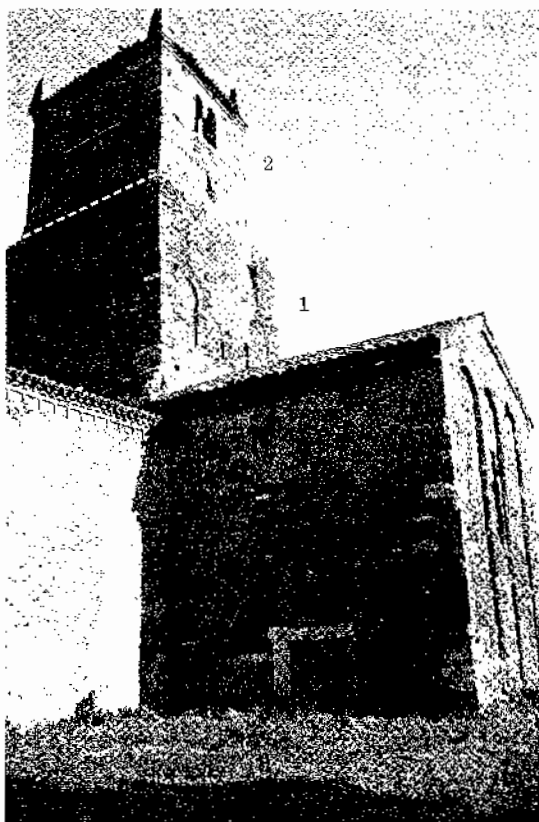


fig. 24 San Pietro in Valle (Verona), church of S.Pietro. The different type of brickwork bears witness to the period when it was built. The transept and the base of the tower (1) are datable to the early Middle Ages; the summit of the tower (2) instead dates back to the 12th century, very likely to have been rebuilt after the 1117 earthquake.

it is impossible to say whether it refers to foundation or reconsecration (Porter 1917; Sandrini 1977; D'Arcais 1981a, b).

San Pietro in Valle (Verona)

The church of S.Pietro goes back to the 11th century, and a good deal of the transept as well as the unaltered ground plan survive from that period. The transept and the base of the cupola belong to the early medieval period, and restoration work identifiable at the top of the cupola can be dated to the second half of the 12th century (Zovatto 1964; Salvini 1978; D'Arcais 1981a, b).

Scardevara (Verona)

The church of Ss.Filippo e Giacomo has been much altered, and there is restoration work which can be dated to between 1120 and 1140 (Arslan 1943; Romanini 1964).

Sommacampagna (Verona)

According to Arslan (1943), the church of S.Andrea was built in two stages: the lower part of the apse and the supports and elevation of the nave belonging to the 11th century, while the apse semi-dome, side walls, aisles and façade belong to a later stage. The apse, in particular, proves to be divided into two types of masonry: the lower part is certainly 11th century work, as one can tell from the frescoes discovered there, but the semi-dome can clearly be seen to have been rebuilt at a later stage, before the mid-12th century. These particular factors allow us to place the church within the damage zone, at least on a conjectural basis.

Vicenza

The basilica of Ss.Felice e Fortunato was founded in the early medieval period. Early medieval materials are involved in the construction of the crypt, which was rebuilt in 1183; considerable decorative work and substantial alterations were carried out at the church in the second half of the 12th century (Porter 1917; *La Basilica dei Santi Felice e Fortunato* 1972).

Vigolo Marchese (Piacenza)

The church of S.Giovanni was founded in the 11th century. Berzolla and Siboni (1966) find stylistic differences between the baptistery and the church, and suggest that the latter had to be rebuilt because of damage in the 1117 earthquake. They deduce this from the fact that excavations under the presbytery (1918) revealed the presence of a building one metre below ground level; and since the baptistery was also one metre below ground level, they argue that the present building may be a 12th century construction.

Environmental effects

The sources pay particular attention to phenomena affecting rivers. While we must keep in mind the cognitive background to such descriptions in chronicle sources, they do seem to refer to real effects of considerable moment. Mention is made of the impressive rise in the water level of the river Po (the Po Plain is in northern Italy) and the blocking of the river Adige for a number of days as a result of a landslide. There are also references to cracks in the ground and the uprooting of trees in the Verona area; and we are told that (in unspecified places) sulphurous springs appeared, lakes overflowed and springs became cloudy.

Po River

There is an impressive description of water rising in the Po in the *Annales S. Disibodi* (pp.22-3), compiled around 1125-1147 by a monk from the Benedictine monastery of Disibodenberg:

"1117. On the eighth day after the feast of St. John the Evangelist [3 January], twice by day and night there was so terrible an earthquake throughout the world that many buildings collapsed and men scarcely managed to flee; but it especially affected Italy, where it was so dangerous and terrible that men expected the manifest judgment of God to fall upon them; and suddenly, because of cracks in the earth, towns, castles and villas were swallowed up, together with the people who were still in them. Indeed, mountains also split open and rivers were swallowed up by the earth, becoming so dry that anyone could cross them on foot.

And the river Po also rose up from its bed so high that it formed an arch, leaving a space between earth and water, and making it quite clear with its lofty waters that the end of the world was threatened. And after the water had remained up high for some time, it finally returned to its usual place with so loud a noise that it could be heard miles away".

1117. In octava sancti Iohannis ewangelistae terrae motus bis inter diem et noctem tam terribilis per totum orbem terrarum factus est, ut multa aedificia corruerent et homines vix effugerent; sed maxime in Italia, ubi tam periculosus et horribilis fuit, ut manifestum Dei iudicium super se homines expectarent; cum per diversa loca Italiae civitates, castella, villae cum hominibus inibi commorantibus subito ab hiatu terrae deperirent. Nam et montes scissi sunt, et flumina, terra deglutiente, exsiccata sunt, ut qui vellent pedibus transire possent.

Necnon fluuius Padus de alveo suo se erigens, in modum fornicis in altum se extulit, ut via pateret inter terram et aquam, et aperte daretur intelligi, quod elatis fluctibus mundo exitum minaretur. Cumque sic diutius acqua penderet, tandem in semet ipsam tanto sonitu demittitur, ut murmur illius per miliaria audiretur.

Landslides, rock falls and the obstruction of the Adige

The *Annales Hildesheimenses* (p.64) record that the course of the river Adige was obstructed by landslides from nearby mountains:

"1117. On the eighth day after the feast of St. John the Evangelist [3 January], far and wide across the world, the earth was shaken by a terrible earthquake, such as had never been heard of before. But especially in Italy this menacing peril raged continuously for many days, to the extent that for some days the course of the river Adige was obstructed by the collision and collapse of the mountains".

1117. In octava sancti Iohannis Euangelistae late per orbem terribili et inaudito hactenus terremotu terra concutitur. Maxime vero in Ytalia minax hoc periculum per multos dies continue deseuit, adeo ut montium collisione et subuersione Aedissae fluminis meatus per aliquot dies obstrueretur.

Overflowing lakes

Guido Pisano (BAVat., Vat. Lat. 11564, fol.184) was a contemporary author who referred to lakes overflowing, in the context of earthquake effects in "Longobardia" – a phenomenon not reported in other sources. Although he does not name these lakes it seems likely that he is referring to Lake Garda and the Lago d'Iseo. He writes: "The lakes also became so swollen that very few inhabitants in the surrounding villages escaped this danger".

Lacus quoque adeo excreverunt ut in villis iuxta positis habitantes paucissimi ab hoc periculo evaderent.

Cracks in the earth and the uprooting of trees in the Verona area

Peter the Deacon refers to violent surface effects in Veronese territory in his continuation of the Montecassino chronicle (pp.524-5):

"January 1117. Furthermore, there were great earthquakes almost throughout Italy at this time [...].

In the city of Verona, too, most buildings collapsed at that time, and great crack appeared in those parts, and many trees rich in foliage were torn up by the roots and thrown out of the ground, and those places were enveloped in smoke".

Jan. 1117. Hoc præterea tempore terremotus magni per universam fere Italiam facti sunt [...].

Tunc quoque in civitate Veronensi maxima pars edificiorum corruit, yatus etiam in eisdem partibus magni facti sunt, et innumere arbores virentibus foliis radicitus evulsas foras eiecte sunt fumoque loca illa obtecta.

The appearance of sulphurous springs (probably in the Veneto region)

After recording the effects of the earthquake on buildings, the *Annales Venetici breves* (p.71) add that sulphurous waters flowed from cracks in the ground. No specific place is mentioned for this phenomenon, but since the annals deal with the Venice area, seems likely that it occurred in the Veneto region:

"In the year of Our Lord 1116, on the third day of the month of January, in the tenth indiction, there was a very terrible earthquake. [...] with the result that even mountains with their crags collapsed in ruins and in many places the earth opened up and sulphurous waters flowed out."

Anno Domini millesimo centesimo sexto decimo, die tercio mensis Ianuarii, indictione decima, terremotus fuit valde terribilis. [...]; pro quo etiam montes cum rupibus corruerunt et exiderunt, et terra in multis locis aperta fuit et aquas sulphureas emanabat.

The clouding of springs

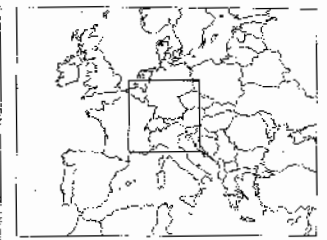
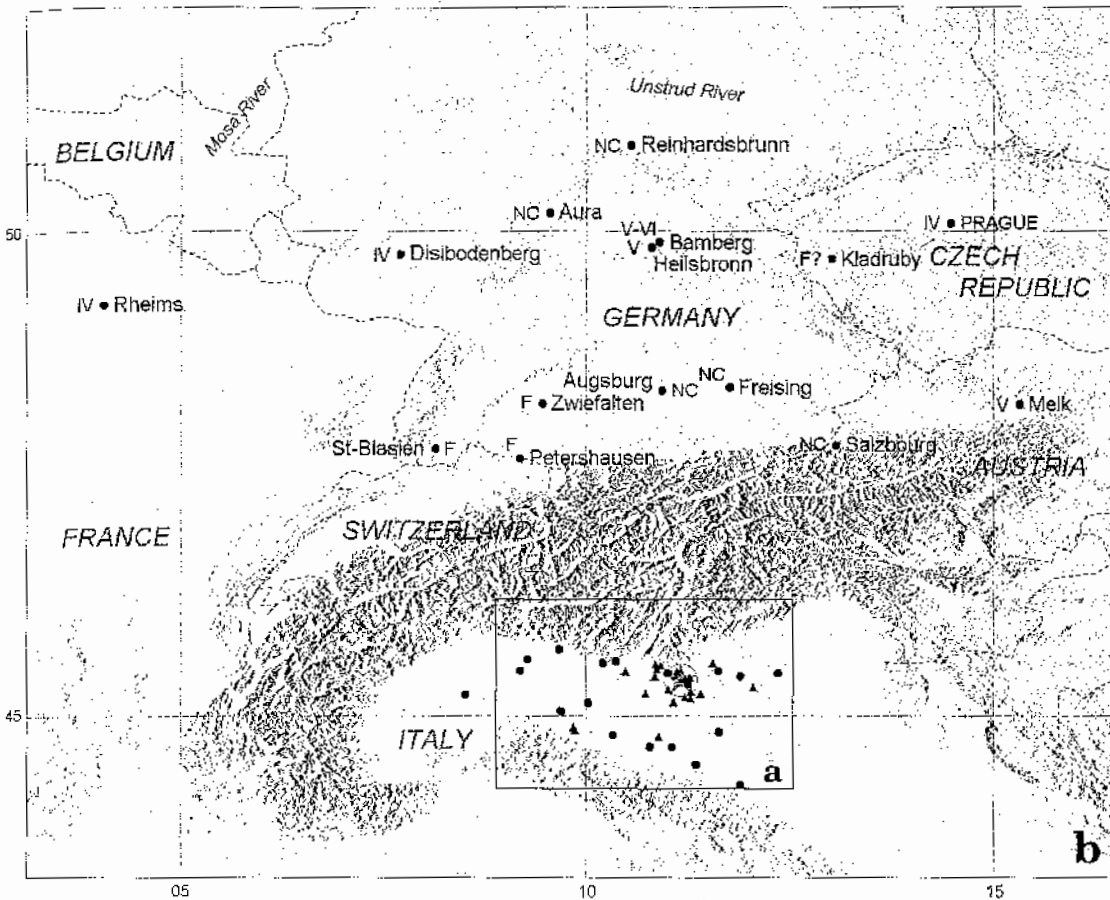
In his continuation of the chronicle of the abbey of Montecassino (pp.524-5), Peter the Deacon refers to the clouding of most springs, but does not indicate exactly where they were:

"January 1117 – Furthermore, there were great earthquakes almost throughout Italy at this time [...] and almost all springs became cloudy as well [...]."

Januar 1117

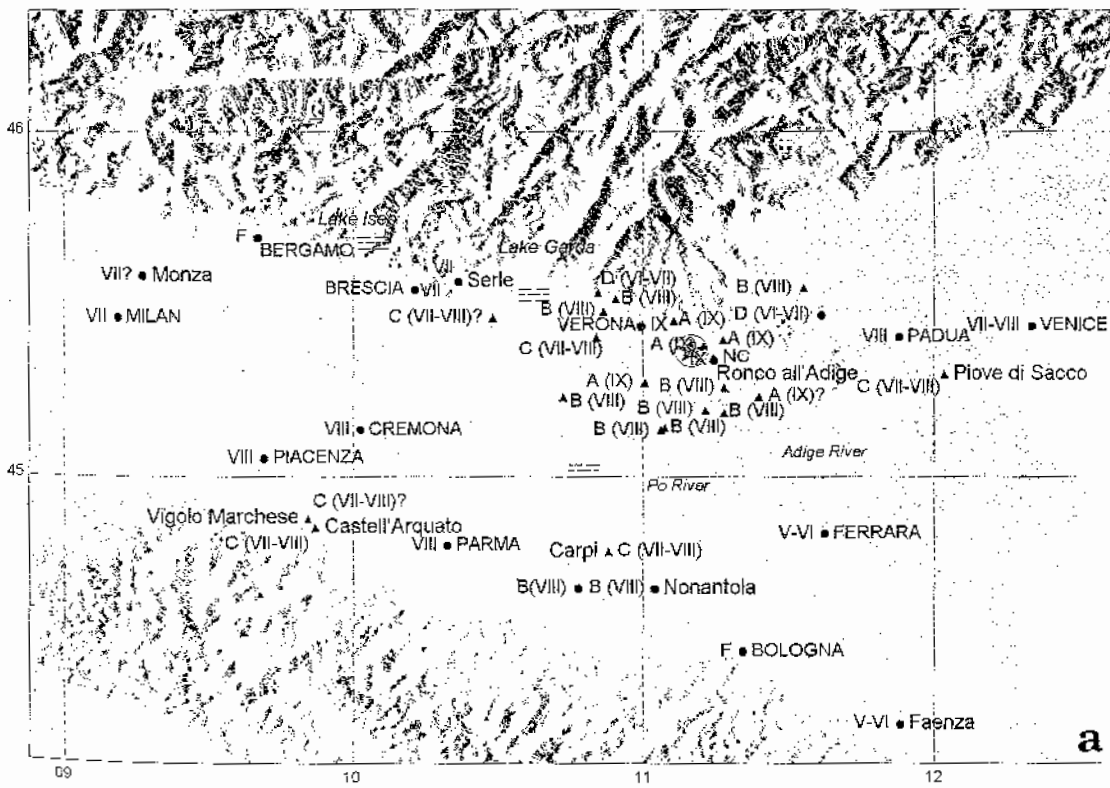
Hoc præterea tempore terremotus magni per universam fere Italiam facti sunt [...] fontes etiam fere omnes turbidati sunt [...].

Since the area north of the Alps lies outside the geographical limits of this volume, we have not included the relevant analytical descriptions or the text of the sources which record the effects of the earthquake in the various localities there, and we refer the reader to Guidoboni *et al.* (2005).



1117
January 3
afternoon
[second earthquake]

figg. 25 a and b



▲ 1117 01 03 15:15 UT ☼ = 45 22 11 10 Io = IX Me = 7.0 Sites: 57

localities	lat.	long.	I	localities	lat.	long.	I
Verona I	45 26	11 00	IX	Brescia I	45 33	10 13	VII
Ronco all'Adige I	45 20	11 15	IX	Milan I	45 28	09 11	VII
Belfiore I	45 23	11 12	A (IX)	Monza I	45 35	09 16	VII?
Bevilacqua I	45 14	11 24	A (IX)?	Serle I	45 34	10 22	VII
Isola della Scala I	45 16	11 00	A (IX)	Costozza I	45 28	11 36	D (VI-VII)
Marcellise I	45 27	11 06	A (IX)	San Giorgio I	45 32	10 51	D (VI-VII)
San Bonifacio I	45 24	11 16	A (IX)	Bamberg D	49 53	10 53	V-VI
Cremona I	45 08	10 01	VIII	Faenza I	44 17	11 53	V-VI
Padua I	45 24	11 53	VIII	Ferrara I	44 50	11 37	V-VI
Parma I	44 48	10 20	VIII	Heilsbronn D	49 50	10 48	V
Piacenza I	45 03	09 42	VIII	Melk A	48 13	15 19	V
Bonavigo I	45 15	11 17	B (VIII)	Bologna I	44 30	11 20	F
Cerea I	45 12	11 13	B (VIII)	Bergamo I	45 42	09 40	F
Cisano I	45 32	10 44	B (VIII)	Kladruby CZ	49 43	13 00	F?
Gazzo Veronese I	45 08	11 05	B (VIII)	Montecassino I	41 29	13 49	F?
Nonantola I	44 41	11 02	B (VIII)	Petershausen D	47 40	09 11	F
Peccantina I	45 29	10 52	B (VIII)	St-Blasien D	47 46	08 08	F
San Faustino I	44 41	10 47	B (VIII)	Zwiefalten D	48 14	09 28	F
San Floriano I	45 31	10 55	B (VIII)	Disibodenberg D	49 46	07 42	IV
San Pietro I	45 11	11 17	B (VIII)	Prague CZ	50 05	14 28	IV
San Pietro in V. I	45 08	11 04	B (VIII)	Rheims F	49 15	04 03	IV
Vicenza I	45 33	11 33	B (VIII)	Augsburg D	48 22	10 55	NC
Venice I	45 26	12 20	VII-VIII	Aura D	50 11	09 33	NC
Carpi I	44 47	10 53	C (VII-VIII)	Caresana I	45 13	08 30	NC
Castell'Arquato I	44 51	09 52	C (VII-VIII)	Freising D	48 24	11 45	NC
Lonato I	45 28	10 29	C (VII-VIII)?	Reinhardsbrunn D	50 52	10 33	NC
Piove di Sacco I	45 18	12 02	C (VII-VIII)	Salzbourg A	47 48	13 03	NC
Sommacampagna I	45 24	10 51	C (VII-VIII)	Scardevara I	45 21	11 14	NC
Vigolo Marchese I	44 53	09 51	C (VII-VIII)?				

(055) 1117 January 3 north-western Tuscany [central Italy]

sources 1 BAVat, *Vat. Lat.* 11564, fol.184, Guido Pisano, *Notula* (ed. Scalia 1963, pp.285-6);
Ann. Pisani antiquis., p.13

sources 2 *Breviar. pisan. hist.*, col.169; *Gesta Lucan.* (*Ann. Lucen.*), p.286; Tol. Lucca, *Ann.*, p.33

historiography Ruyschaert (1959); Redi (1984)

literature Guidoboni *et al.* (1986); Guidoboni and Boschi (1989); Guidoboni *et al.* (2005)

This earthquake is not listed in Italian catalogues, having been linked to the large earthquake of 3 January 1117 in the Verona area.

During the night of 2-3 January 1117, an earthquake was felt in the Pisa area. It aroused fear but did not cause any damage. It aroused fear but did not cause any damage. In the afternoon, at about the eleventh hour according to the custom, that is 14:00 local time, a much stronger earthquake caused many towers, bell-towers and other buildings to collapse in Pisan territory. A few people were killed. The terror-stricken survivors abandoned their homes, leaving them unguarded. This earthquake is borne witness to by two authoritative Pisan sources: a long *Notula* by Guido Pisano and the *Annales pisani antiquissimi*. The richest source of information is Guido Pisano, the author coeval to the events, who left a long and complex description clearly referable

to the Tuscan area.

Since Pisa is a long way from the epicentral area of the almost contemporaneous earthquake in the Verona area (see the preceding entry), it is reasonable to infer that the collapses and environmental effects in Tuscany described in the sources resulted from the activation of a different seismic sources from those which gave rise to effects hundreds of chilometri away in northern Italy and Germany. The time at which Guido Pisano tells us this earthquake occurred does not allow a clear distinction to be made between it and the earthquake in northern Italy and Germany, to which the text by Guido also refers. Guido Pisano says that the earthquake occurred at the eleventh hour, and that coincides with what we read in a source from the Constance area (*Casus monasterii Petrishusensis*, p.661), though it is slightly different from what we find in a source from the Melk area in Austria (*Auctarium Zwettlense*, p.540), where the tenth hour is given (see the preceding entry). However, it should not be forgotten that the indication of the time "the eleventh hour" indicated in the medieval calculation a timeframe of one hour, not the exact time, as is the case in the modern meaning of time.

Apart from Pisa, other parts of Tuscany were also affected, though less severely. Lucca may have been one of these, for some late sources, dating to the early 14th century, record "great earthquakes" there. But some doubts remain as to when they occurred, since they are dated to 1112 and not 1117 (see below).

Some springs in the Pisa area overflowed; at some unidentified places (but presumably in Tuscany) the river Arno burst its banks; and treetops were seen to touch the ground. The primary sources available are: a long and detailed annotation by Guido Pisano, in which he clearly also mentions the two previous earthquakes on 2nd-3rd January and 3rd January 1117; the other primary source is a contemporary local chronicle, the *Annales Pisani antiquissimi*, which is independent of Guido Pisano.

Guido Pisano's text is preserved in codex *Vaticanus Latinus* 11564, fol.184, in the Biblioteca Apostolica Vaticana (fig. 26). This is a 1459 copy which very probably derives from the 12th century original (for a description of the codex, see Ruysschaert 1959, pp.311-5; for the account, see pp.313-4). The text has been published by Scalia (1963, pp.285-6), but in the course of our research we consulted the original manuscript:

"In the name of Our Lord Jesus Christ, the Eternal God, in the year 1117 since His Incarnation, on the third day of January. In the sixth year of the reign of the Emperor Henry V in Italy, when the most blessed pope Paschal II was at the head of the Roman church, great earthquakes such as had never before occurred in our times

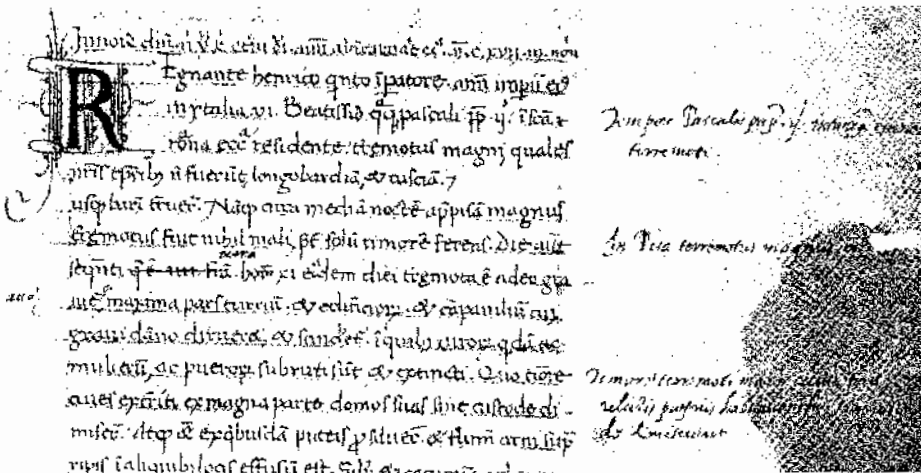


fig. 26 The long *Notula* by Guido Pisano (late 11th – first half of 12th century) on the various earthquakes in January 1117 which struck an area north of the Alps, the Po Plain and north-west Tuscany in rapid sequence (Biblioteca Apostolica Vaticana, *Vat. Lat.* 11564, 15th century copy).

struck terror in Longobardia and Tuscany and even Bari.

For towards the middle of the night, there was a great earthquake in the Pisa area; but it caused no damage, only fear. But the following day, the fourth of the week [Wednesday], there was so serious an earthquake at the eleventh hour that most of the towers, bell-towers and other buildings collapsed into rubble, and some men, women and children were killed in the ruins. The earthquake struck such terror into the local people that they left many of their houses unguarded.

Some wells also overflowed, and at some places the Arno burst its banks. Other towns and villages in Tuscany were affected, but not so seriously. [...].

In nomine Domini nostri Ihesu Christi eterni Dei, anno ab incarnatione eius MCXVII, III nonas ianuarii. Regnante Henrico quinto imperatore, anno imperii eius in Ytalia VI, beatissimo quoque Pascali Papa II in sancta romana Ecclesia residente, terremotus magni, quales nostris temporibus non fuerunt, Longobardiam et Tusciam et usque Barim terruerunt. Namque circa mediam noctem apud Pisam magnus terremotus fuit, nihil mali preter solum timorem ferens. Die autem sequenti, que est IIII feria, hora XI eiusdem diei, terra mota est adeo graviter quod maxima pars turrium et edificiorum et campanilium cum gravi damno dirueret et scinderetur, in quibus virorum quidam, mulierum ac puerorum subruti sunt et extincti. Quo timore cives exterriti ex magna parte domos suas sine custode dimiserunt.

Aque etiam ex quibusdam puteis prosiluerunt et flumen Arni supra ripis in aliquibus locis effusum est. Similiter et cacumina arborum terram tangere videbantur. Concusse sunt et alie civitates et loca per Tusciam, sed non ita graviter.

Guido Pisano goes on to mention effects in "Longobardia" and at Verona, and he concludes as follows:

"Indeed, these earthquakes lasted for forty days, during which the people abandoned their towns and left their homes without anyone to look after them, and they dwelt in the countryside or the outskirts".

Duraverunt autem hi terremotus per dies XL, in quibus cives, relictis urbibus et domibus suis nullis adhibitis custodibus, in villis et in suburbiis habitabant.

In the introduction to his text, Guido Pisano mentions the city of Bari (in *Apulia* in southern Italy), as though he meant that these earthquakes were felt there as well. The reference to Bari may simply be for the rhetorical purpose of involving a distant city. Another possibility is that there was a local and independent earthquake at Bari. Unfortunately, the lack of contemporary local sources for *Apulia* prevents us from confirming this somewhat enigmatic reference.

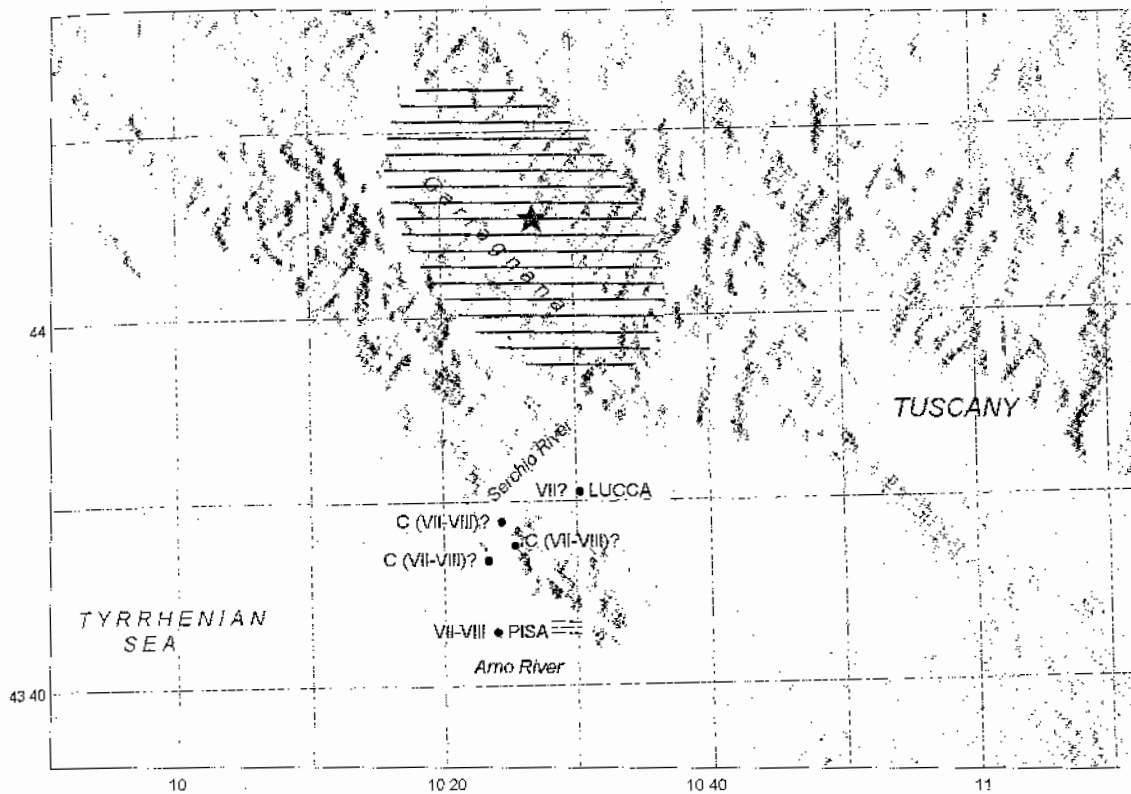
The collapse of towers in the Pisa area is also recorded in the *Annales Pisani antiquissimi*, a contemporary source which is independent of Guido Pisano. The text has been published in Novati (1910, p.13). The reference to the earthquake is extremely brief, and does not specify the month or day when it occurred:

"1117. There was a very strong earthquake, which caused the collapse of many towers of the Pisans".

Mill CXVII ingens terremotus fuit quod multes pisanorum turres corruerunt.

There were "many towers of the Pisans" to be found in the lower valley of the river Serchio to the north of Pisa: the actual geographical expressions used by the source are: "in the Pisa area" (*apud Pisam*) and "towers of the Pisans" (*pisanorum turres*).

An archaeological study of the medieval fortifications along the border between Pisa and Lucca shows that in the period around the mid-12th century and in the late 12th and early 13th centuries, reconstruction work was carried out at the castles of Ripafratta and Vecchiano and on the tower at Quosa. However, the author (Redi 1984, p.380) makes no mention of damage due to the earthquake which he seems to have no



1117
January 3

0 15 km

fig. 27

knowledge of. The indication of these locations derives from an hypothesis of damage in Guidoboni *et al.* (2005). It is likely that this earthquake also affected Lucca — or was at least strongly felt there. The *Gesta Lucanorum* (or *Annales Lucenses*, p.286), a chronicle in Italian compiled around 1304-1305 by an inhabitant of Lucca, in fact refers to “great earthquakes”; and for the period between the mid-12th century and 1276, it derives from old annals of the city, now lost. However, Lucca is not specifically named, and the earthquake is dated to 1112, perhaps because “V” has been omitted between “X” and “II” in the date. The text reads: “1112. There were great earthquakes”.

MCXII. *Furo grandi tremuoti.*

The *Annales* (p.33) of Tolomeo da Lucca (early 14th century), are more explicit in that they specifically mention Lucca, but they give the same date as the preceding chronicle (1112), because they derive from the same common source.

localities	lat.	long.	I	localities	lat.	long.	I
Pisa	43 43	10 24	VII-VIII	Ripafratla	43 49	10 24	C (VII-VIII)?
Lucca	43 51	10 30	VII?	Vecchiano	43 47	10 23	C (VII-VIII)?
Quosa	43 48	10 25	C (VII-VIII)?				

▲ 1117 01 03 15:15 UT ★ = 44 05 10 27 I₀ = VII-VIII Sites: 5

(056) 1117 February 20 - 1118 February 19 [567 A. e.]
Marmet [eastern Turkey]

sources colophon in Yovsep'ean (1951, pp.329-30); Bar Hebr., *Chron.*, p.281

historiography Röhricht (1898)

catalogues d. Zeyt'unyan (1991)

There was an earthquake at Marmet (in the historical region of Vaspurakan) in the period 20 February 1117 – 19 February 1118. The source for this event is a colophon appended to an Armenian commentary on Isaiah (manuscript E' miacin 1239/1214) compiled at Marmet in 1117/8. It states:

“In that year [567 = 1117-8], there were terrible omens from heaven and earth. The blue sky became blood red, the stars were seen to be in a state of turbulence, and there were earthquakes in a [?]”.

յորում ամի եղև նշանք ահագինք, յերկնէ եւ յերկրէ, եւ յաւգոց կարմրանալ երկինց ի գոյն արեան, եւ թաւթափումն աստեղացն յայտնի տեսալեամբք, եւ շարժումնք մի զմիոյ կնի...

Bar Hebraeus (1225–1286) also records an earthquake in this period, but does not indicate its location:

“And in the year five hundred and eleven of the Arabs [1117] ... and in this year also, which is the year fourteen hundred and twenty-nine [of the Greeks, 1118] ... thirteen kings died within two years. Before they died a violent earthquake took place, and the death of the kings followed soon after it”. [Budge’s transl.]

... : ԿԱՅՆԱ ՄԱԾԻՔ. ԺԱՅ ԵՄԱ ԵՔ ԿԺԱՅՆ ԻՆՈՑ ... : ԿԱՅՆԱ ԺԱՅԻ. ԺԱՅԻՆ
ԿԱՅ ԿԱՅԻ : ԳԺԱՅԱՆ ԵՎ ՄԱՑ ԳԺԱՅԻ ԲԱՅ ԻՆՈՑ ԿԱՅՆ ԿԱՅՆԱ ԿԱՅՆԱ
. ԿԱՅՆԱ ԿԺԱՅՆ ԵՄԱ ԻՆՈՑԱ : ԿԱՅՆ ԿԱՅՆԱ

Matthew of Edessa’s report of a strong earthquake with collapses at Samosata in 1117 must in fact be a reference to that of 13 November 1114 (see the entry concerned).

▲ 1117 02 20 – 1118 02 19 [567 A. e.]

localities	lat.	long.	I
Marmet	38 39	43 14	V

< 057 > 1117 June 26 Scandelion [Lebanon]

sources 1 Fulk Chart., *Hist.*, p.435; Lis. Tours, *Ad secund.*, p.574

sources 2 Tol. Lucca, *Hist.*, cols.1090-1

catalogues d. Amiran *et al.* (1994)

On 26 June 1117, an earthquake caused collapses at the fortress of Scandelion (south of Tyre), and in an area which the sources do not identify but must have been in Palestine (the principal source, Fulk of Chartres, was living in Jerusalem at the time of the earthquake) and southern Lebanon (Scandelion is in fact on the southern coast of Lebanon, about 12 km from Tyre).

After recording a plague of locusts and a lunar eclipse, Fulk of Chartres writes: “1117. [...] The month of June. [...] When He wishes, God causes the earth to shake and then calms it again. That is what happened a little later that month, deep in the silence of the night, on the sixth day before the Calends of July [26 June].

Then the king [Baldwin of Jerusalem] built a fortified place about five miles outside the city of Tyre, and called it Scandelion, which means Field of the Lion, and he repaired the damage and posted guardians there to keep the said place under control”.

1117. [...] *Quidem mense, qui Iunius erat [...]. Deus [...] qui etiam quando vult terram facit tremere, et postea quiescere; quod subsequenter accidit in eodem mense noctis intempestae silentio, VI kalendas Iulii.*

Tunc edificavit rex quoddam castrum prope urbem Tyrum, intra quintum ab urbe milliarium, quod vocavit Scandalion, et Campum Leonis interpretatum, et resarciivit diruta eius, et posuit in eo custodes ad coercendum urbem predictam.

Lisiard of Tours, who depends largely on Fulk of Chartres, records:
"1117. [...] The plague of locusts was followed, on the sixth day before the Calends of July, by a terrible earthquake, which showed men the need to act rapidly in order to placate the wrath of God. Buildings were so shaken that they collapsed, and so the hard hearts of foolish men were moved to penitence".

Anno .M.C.XVII. [...] Secutus est locustae pestem, sexto kalend. Julii, horribilis nimis terrae motus, iram Dei praemonens citius debere placari. Concutiebantur ad ruinam aedificia, ut dura hominum stolidorum ad poenitentiam concuterentur corda.

Tolomeo da Lucca, a Tuscan author who lived from about 1240 to 1327, mistakenly associates this earthquake with the one which occurred in the same year in Italy, as well as with the death of Alexius I Comnenus immediately afterwards.

▲ 1117 06 26 at night

localities	lat.	long.	I
Scandalion	33 08	35 10	VIII-IX

< 058 > 1120 January 1 Melitene area? [south-eastern Turkey]

sources Mich. Syr., 15.12, *Chron.*, IV, p.597

This earthquake is unknown to the seismic catalogue tradition. Until now it has been attested to by just one, albeit authoritative, source.

Michael the Syrian, a 12th century monk, mentions a violent earthquake on the first day of January in 1120 which destroyed many places; but he does not specify their exact location. Since he was a native of Melitene, which stood near present-day Malatya (south-eastern Turkey), became archimandrite at the monastery of Bar Sauma, which was situated near Melitene, it seems reasonable to suppose that the earthquake struck the Melitene area. He writes:

"In the year fourteen hundred and thirty-one [of the Greeks, 1 October 1119 – 30 September 1120], on Thursday 1 *Canun II* [January], there was a violent earthquake at the third hour which destroyed many places".

ⲓⲛ ⲛⲓⲛⲓ ⲛⲓⲛⲓ ⲛⲓⲛⲓ ⲛⲓⲛⲓ ⲛⲓⲛⲓ ⲛⲓⲛⲓ ⲛⲓⲛⲓ ⲛⲓⲛⲓ ⲛⲓⲛⲓ ⲛⲓⲛⲓ ⲛⲓⲛⲓ ⲛⲓⲛⲓ
..ⲛⲓⲛⲓⲛⲓ ⲛⲓⲛⲓⲛⲓ ⲛⲓⲛⲓⲛⲓ ⲛⲓⲛⲓⲛⲓ ⲛⲓⲛⲓⲛⲓ ⲛⲓⲛⲓⲛⲓ ⲛⲓⲛⲓⲛⲓ ⲛⲓⲛⲓⲛⲓ ⲛⲓⲛⲓⲛⲓ ⲛⲓⲛⲓⲛⲓ

△ There are no elements with which to indicate the parameters.

< 059 > 1120 March 25 – 1121 March 24 [1120 I. s.] Latium [central Italy]

sources 1 Peter Deac., *Cont.*, pp.527-8; *Ann. Casinen.*, p.308

source 2 *Chron. reg. Colon.*, p.59

historiography Lancellotti (1673); Tria (1744); Di Meo (1795); Tosti (1843); De Marco (1888); Fabiani (1968); Santoro (1985); Bloch (1986); Carràra (1995)

literature Molin (1995)

catalogues d. Bonito (1691); Ferrey (1848); Mallet (1853); Capocci (1861-63); Pilla (1837); Mercalli (1883); Baratta (1901); Paoloni (1913-14); Grumel (1958); *Boschi *et al.* (1995, 1997, 2000)

An earthquake which occurred between 25 March 1120 and 24 March 1121 had destructive effects in an area including the slopes of Monte Camino, to the east of the river Garigliano. In dating the earthquake, Peter the Deacon uses the Incarnation style, in which the year begins on 25 March. The events to which he is referring are therefore to be assigned to the period between 25 March 1120 and 24 March 1121.

At the time, this area was at the south-eastern edge of the territory under the jurisdiction of the abbey of Montecassino. The most important contemporary source is the authoritative *Chronica monasterii Casinensis* by Peter the Deacon, abbot of Montecassino, who continued the work of Leo of Ostia. In it he provides detailed information about the earthquake, noting in particular the very large number of successive shocks, and pinpointing the area of worst damage at Cocuruzzo, Camino and Bantra (present-day Rocca d'Evandro): three fortified villages in the present-day province of Caserta, not far from Montecassino. Damage was caused to the church, its tower and some houses at Rocca d'Evandro, to the town hall at Camino (local seat of the chief political and jurisdictional representative), and to the church and adjacent buildings at Cocuruzzo.

Historiographical research into the abbey of Montecassino, its properties and jurisdiction (Fabiani 1968; Bloch 1986) has made it possible to identify Rocca d'Evandro as having definitely been struck by the earthquake. At that time, it was called "Bantra comitalis" or "Rocca de Bantra", and has hitherto been confused with Bantra, then called "Bantra monacisca". The latter is now abandoned, and its ruins are to be found about 4 km north-east of present-day Rocca d'Evandro.

Peter the Deacon records:

"At that time, then, 1120 years after the Incarnation of Our Lord, there were such great earthquakes in this area that the town hall in Camino was destroyed, the church and its curia at Cocuruzzo were badly damaged, and at Bantra [Rocca di Bantra] the church, houses and bell-towers were razed to the ground. Many people were killed in this disaster, and on individual days we felt now nine, now seventeen, and now twenty or more shocks".

Eo igitur tempore cum iam ab incarnatione Domini annus vicesimus centesimus atque millesimus voveretur, tam magni terremotus in hac terra facti sunt, ut in Camino palatium dirueret, in Cucuruzzu ecclesiam cum curia subverteret, apud Bantram ecclesiam, domos et campanaria ad terram deiceret multique sub ipsa ruina interirent et nunc quidem novem, nunc decem et septem, nunc viginti et eo amplius id per dies singulos sentiremus.

The chronicle goes on to record the apparition of St. Benedict.

As is often the case in monastic chronicles, the earthquake is placed in a supernatural context and so given a symbolic significance. It should be noted in particular that Peter the Deacon attributes miraculous qualities to the body of Saint Benedict.

There is simply a generic reference to the earthquake in the *Annales Casinenses*, an anonymous work compiled in the abbey of Montecassino at the end of the 12th and the first half of the 13th century:

"1120. [...] There were great earthquakes for many days in the territory of Saint Benedict and all around, causing many buildings to collapse".

1120. [...] Terre motus magni per plures dies in terra sancti Benedicti et circumquaque fuerunt, ita ut edificia multa ruerent.

There is a German chronicle (the late 12th – early 13th c. *Chronica Regia Coloniensis*), compiled by Benedictine monks in the diocese of Cologne, which makes very vague reference to an earthquake in 1120.

(1581a, b); Ciaconius [Chacón] (1601); Mirabella (1613); Morigia (1614); Goutoulas (1665); Lancellotti (1673); Coronelli (1693); Cajetani (1707); Pirri (1733); Caruso (1737-45); BarcAlag, Syracuse, Gaetani, *Ann.*, 18th c.; Capodieci (1816); Moroni (1840-79); Camera (1860); Privitera (1863); Agnello (1874); Privitera (1878-79); Agnello (1888); Gemmellaro (1859); Sciuto Patti (1896); Chevalier (1907)

literature Guidoboni (1996); Guidoboni and Traina (1996)

catalogues d. Bonito (1691); Mongitore (1743); Mallet (1853); Mercalli (1883); Baratta (1901); De Stefano (1987); *Boschi *et al.* (1995, 1997, 2000)

catalogues p. Giorgetti and Iaccarino (1971); Carrozzo *et al.* (1973); Postpischl (1985)

On Sunday 7 June 1125, at about 7:15 UT (about the third hour, during Sunday mass), there was an earthquake with destructive effects at Syracuse. At that time the city extended no further than present-day Ortigia (the old town). It is recorded that the cathedral collapsed, as well as the city walls and many houses. At the cathedral, which was in fact an ancient 5th century BC temple of Minerva transformed into a Christian church in the 8th century AD, damage was limited to the collapse of the apse and the roof over the principal nave. In this connection, Privitera (1863) suggested that long reinforcement beams were added during the Norman period, towards the mid-12th century. Many people were killed in the church. There are no reports of seismic effects at other localities.

The earthquake was the object of a specific study by Guidoboni (1996) and Guidoboni and Traina (1996), who threw light on the complex erudite and historiographical tradition which had "observed" it by giving it a variety of dates. From the 16th to the 18th century, in fact, erudite Sicilian historiography recorded a destructive earthquake at Syracuse with dates ranging from 1070 to 1148. Set out in summary form in the table below are no less than 28 sources between the 16th and 18th centuries with different dates for the earthquake (see the table at the bottom of the page).

Following on the above study, an analysis was carried out both of the relationship between the various texts and the characteristics of the language used by the earliest authors. This revealed two parallel traditions in which the earthquake is recorded: one Greek and the other Latin. The former is a lost tradition, from which erudite Sicilian historiography derives. We therefore worked backwards in our search for the earliest sources.

Of considerable interest was the indirect evidence contained in the *Catalogo mano-*

List of different dates in the erudite historiographical tradition for a destructive earthquake at Syracuse between 1070 and 1148 (from Guidoboni and Traina 1996)

year	month	day	author	year	month	day	author
1070	-	-	Marcello Bonito (1691)	1100	-	-	Conrad Lycosthenes (1557)
			Conrad Lycosthenes (1557)				Mario Arezio (1719)
1072	-	-	Girolamo Bardi (1581a)				Vincenzo Mirabella (1613)
1082	-	-	Girolamo Bardi (1581b)				Giuseppe Capodieci (19th c.)
1086	-	-	Secundus Lancellotti (1673)	1110	-	-	Vincenzo Coronelli (1693)
1086/87	-	-	Bartolomeo Sacchi (Platina) (15th c.)	1125	-	-	Rocco Pirri (1733)
			Johannes Naclerus (1675)	1130	06	07	<i>Catalogo ms Vescovi</i> (now lost - copy in Pirri 1733)
			Marc'Antonio Sabellico (1504)				Cristoforo Scobar (1520)
			Giovanni Tarcagnola (1558)				Giuseppe Capodieci (19th c.)
			A. Ciaconius [Chacón] (1601)	1140	-	-	Antonino Mongitore (1743)
			Vincenzo Magnati (1688)				Rocco Pirri (1733)
1087	-	-	Iacobus Goutoulas (1665)	1140	04	06	Giuseppe Capodieci (19th c.)
1094	-	-	Paolo Morigia (1614)	1148	-	-	Martinus Scotus (in Pirri 1733)
1100	-	-	Matteo Palmieri (15th c.)				

scritto dei Vescovi della Chiesa di Siracusa, cited by various authors, but no longer in existence. The text was once in the library of Syracuse cathedral (the present-day Biblioteca Alagoniana), where it was consulted by Scobar (1520), Cajetani (1707) and Pirri (1733), who left a transcription. The original manuscript, which is thought to have been compiled no earlier than the 12th century, was probably destroyed in a famous fire in which many more of the library's books were lost. According to Cajetani (1707), this *Catalogo* derives from lost Greek sources. It has been suggested that it was composed either by various hands at different periods, or by a single author using material from the period when Greek was still the language of the liturgy at Syracuse. The date of the *Catalogo manoscritto dei Vescovi della Chiesa di Siracusa* cannot be established with any precision. Perhaps it belongs to the 14th century, since Pirri cites it in his work in connection with the bishops of the first half of that century. His evidence reads as follows:

"In the year 1130, on Sunday the seventh day before the Ides of June [7 June] in the third indiction.

The cathedral church [of Syracuse] collapsed in a great earthquake, crushing and killing all those who were inside, the only three survivors being the priest who was conducting the service, and the deacon and subdeacon who were serving at the altar".

Anno 1130. Die dominico 7 idus Iunii indictione 3

Magno terraemotu Cathedrale templum ruens omnes qui illic erant, oppressit, extinsitque praeter tres, scilicet Sacerdotem sacrum agentem, Diaconum, et Subdiaconum altari ministrantes.



fig. 28 In medieval times the city of Syracuse developed across part of the old Greek city into present-day Ortigia, depicted here in a map of Sicily of c.1580 (Musei Vaticani, Gallery of Geographical Maps).

Using this information as a starting point, research was carried out to identify the parallel Latin tradition. We began with the 15th century text by Platina (Bartolomeo Sacchi), who refers to the Syracuse earthquake as follows:

"They write that at this time [1086] many prodigies appeared, with domesticated birds such as hens, geese, doves and pheasants fleeing to the mountains and becoming wild, and most sea and freshwater fish dying. Some cities were also badly shaken in an earthquake, so much so that Syracuse cathedral collapsed while vespers was being celebrated, killing all those who were in the church, the only two who survived by the grace of God being the deacon and subdeacon".

Sunt qui hoc tempore multa prodigia apparuisse scribant, quod et aves domesticae, utpote gallinae, anseres, columbi, pavones, ad loca montana confugerint, sylvestresque sint factae, et pisces tum fluviales tum marini magna ex parte perierint. Terraemotu etiam quaedam urbes adeo concussae sunt, ut Syracusis maior basilica corruens, dum vesperae celebrarentur, omnes, qui tum in templo aderant, contriverit, duobus tantum divinitus superstibus, diacono scilicet et subdiacono.

Taking the *topos* of the cathedral's collapse and the three survivors as a sort of guide, we then proceeded to identify Platina's own sources. The various segments of information within his text derive from a number of heterogeneous traditions brought together in a manner similar to that used in antiquity in the prodigy lists of pagan historiography. We compared Platina's text with that of one of his principal sources, Tolomeo da Lucca's *Historia ecclesiastica*, which was written in the late 13th century. For prodigies, Tolomeo makes explicit reference to the *Speculum Historiale* by Vincent of Beauvais, who was writing round about 1245. There are many similar narrative elements in the latter text, but no mention of the Syracuse earthquake. So the text relating to the Syracuse earthquake must be an independent one.

Of all Tolomeo's sources, only one records the earthquake in almost the same words as his own text. This is the *Chronicon Pontificum et Imperatorum* by Martin of Troppau (13th c.), also known as Martinus Polonus or Martinus Oppaviensis:

"At about this period [before the death of Gregory VII in 1087], the city of Syracuse in Sicily was struck by a great earthquake, so that on Sunday at about the third hour, as mass was being sung, the cathedral collapsed, crushing all the congregation and clergy in its fall. The only survivors were the priest, and the deacon and sub-deacon who were celebrating mass with the priest, to the astonishment of all".

Circa hec tempora civitas Syracusana in Sycilia magnum terre motum sustinuit, adeo ut dominica die circa horam tertiam, dum missa cantaretur, ecclesia maior cadens omnem populum et clerum opprimeret, sacerdote, diacono, subdiacono missam celebrantibus cum presbitero tantum salvis, non sine magna omnium hominum admiracione.

In his account of the Syracuse earthquake, Martin of Troppau makes no explicit reference to any earlier chroniclers; but at the beginning of his own work (pp.407-8) he lists the seven chroniclers he used as sources (some of which are now lost). In what has been published of the fragmentary texts of these authors, we have found only one reference to the Syracuse earthquake. This occurs in the chronicle of Richard of Poitiers, a monk from the abbey of Cluny who lived in the second half of the 12th century. There are three successive *recensiones* of his chronicle:

- the first was written about 1153 and goes up to 1145;
- the second reaches 1162;
- the third reaches 1172-1174.

The third *recensio* contains a particularly interesting passage for the Syracuse earthquake. This version is preserved in three manuscripts which themselves contain certain variants. The text of two of the three (both dating to the 13th century and preserved in

Perugia and Madrid respectively) is the basic original text and records the effect of the earthquake not only on the cathedral but also on the city walls and many houses: "Subsequently, in the year of the incarnation of the Word 1128, towards the third hour, there was a great earthquake in the city of Syracuse in Sicily, with the result that the cathedral suddenly collapsed as the clergy were celebrating Sunday mass, and all the clergy who were reciting psalms in the choir [perished in the church; and the bishop, who happened to leave after the Gospel reading, was the only survivor] together with the deacon and subdeacon who were celebrating mass, and the priest [? the presbytery] survived, to the great amazement of all. And the Fountain of Arethusa, which springs by the city wall and used to provide the citizens with drinking water, became salty. This provided considerable confirmation of the fables of the poets who claim that this same water passes from Greece to Sicily under the sea through subterranean channels and comes out of the earth along with the river Alpheus at the said fountain. The city walls also collapsed, together with many houses".

Post hec tempora in Sicilia civitate Syracusis anno ab incarnato Verbo 1128, circa horam diei tertiam factus est terre motus magnus, ita ut ecclesia episcopii, cum clerici missam cantarent dominicam, in ictu oculi caderet et clerici omnes in choro psallentes cum ecclesia perirent; episcopus solus, qui forte post evangelium exierat, salvatus est cum diacono et subdiacono, qui missam celebrabant, remanente presbitero superstite, cum magno omnium miraculo incolumes evaserunt. Fons etiam Aretusa prope muros civitatis ebulliens, qui potum civibus ministrabat, versus est in salsuginem. Que res non modicum tribuit fabulis poetarum fides, que astruunt, de Grecia in Siciliam per subterraneos meatus sub mari rursus hanc eandem aquam cum Alpheo fluviò de terra emergere se ipsam in fontem predictum. Muri eciam urbis predictæ cum multis domibus corruerunt.

Richard of Poitiers, writing about fifty years after the earthquake, specifically dates it to 1128, and says that damage to the church involved the collapse of the choir but not the whole roof, and that there was also damage to the city walls and many houses. He also mentions the fact that salt water penetrated into the Fountain of Arethusa.

We thus see that the Greek tradition, as taken up by Scoabar (1520) through the above-mentioned *Catalogo manoscritto dei Vescovi della Chiesa di Siracusa*, and the Latin tradition deriving from Richard of Poitiers, have fairly different texts and substantial discrepancies in dating the earthquake. Scoabar (1520) dates it to 7 June 1130, but Richard of Poitiers to 1128. As Rocco Pirri (1733) noted, 1130 does not fit the indiction cycle indicated, for while the years 1125 and 1140 fell within the third indiction, 1130 did not. So the dating suggested by Scoabar is not to be trusted. An analysis of all possible points at which the day of the week (Sunday), the year and the indiction cycle coincide suggests that the most likely date for the earthquake is 7 June 1125 (Guidoboni and Traina 1996).

▲ 1125 06 07 11:00 UT
 localities lat. long. I
 Syracuse 37 05 15 17 VIII-IX

< 062 > 1127 February and November Melitene area? [south-eastern Turkey]
 source Mich. Syr., 16.2, *Chron.*, IV, p.608
 literature comets: Ho Peng Yoke (1962)

This earthquakes are unknown to the seismic catalogue tradition. Michael the Syrian, a 12th century monk, mentions that there were several earthquakes in February and November 1127; but he does not record a specific location or effects. For the month of February, he refers in general terms to earthquakes, without

(064) 1133 February 3 and September Melitene area?
[south-eastern Turkey]

source Mich. Syr., 16.5, Chron., IV, p.614

This earthquakes are unknown to the seismic catalogue tradition.
Michael the Syrian, a 12th century monk, mentions that there were two earthquake shocks during the night of 3 February and also in September 1133; but he does not specify the location or effects. Since he was a native of Melitene, which stood near present-day Malatya (south-eastern Turkey), became archimandrite at the monastery of Bar Sauma, which was situated near Melitene, it seems reasonable to suppose that the earthquake struck the Melitene area. He writes:

“And in the year fourteen hundred and forty-four [of the Greeks, 1 October 1132 – 30 September 1133], there was an earthquake during the night, on 3 *Shebat* [February].

..ܣܘܒܐܬܐ ܕܝܗܘܕܐ ܕܝܘܢܝܘܢ ܕܝܘܢܝܘܢ ܕܝܘܢܝܘܢ

And he goes on immediately afterwards:

“And in *Elul* [September], there was an earthquake during the day and a vibrating sound in the evening. And after that, a terrible sign appeared, like fire”.

ܕܝܘܢܝܘܢ ܕܝܘܢܝܘܢ ܕܝܘܢܝܘܢ ܕܝܘܢܝܘܢ ܕܝܘܢܝܘܢ ܕܝܘܢܝܘܢ
..ܟܝܢ ܕܝܘܢܝܘܢ ܕܝܘܢܝܘܢ ܕܝܘܢܝܘܢ

Since there are no specific references to serious consequences, the earthquakes were presumably weak.

△ There are no elements with which to indicate the parameters.

(065) 1135 September 23 Tolotap' [eastern Turkey]

source 1 Mich. Syr., 16.7, Chron., IV, p.617

source 2 Bar Hebr., Chron., p.293

historiography Hewsen and Bandomer (1988)

catalogues d. von Hoff (1840); Perrey (1850); Mallet (1853); Step'anyan (1964); Guidoboni and Traina (1995)

catalogues p. Karapetian (1991); Berberian (1997)

On 23 September 1135, there was a strong earthquake in Armenian territory: the sources indicate that the town of Tolotap' “collapsed”, but add no further details. This earthquake is not well known to the Armenian tradition, but is reported in the Syriac tradition, from which it entered 19th century catalogues for the Mediterranean area. Step'anyan (1964, p.56) and Karapetian (1991, no.32), however, register a seismic event for Armenia as a whole in 1134, and it is very probable that this is in fact the same event.

The principal source for the earthquake is Michael the Syrian, a 12th century monk. After recording a strong earthquake in July 1135 — probably the earthquake which struck Iraqi Kurdistan on 25 July 1135 (see Ambraseys and Melville 1982, pp.41-2) — he goes on:

“And in that year there was a great earthquake in Armenia, which caused the collapse of a town called Dogodap [Tolotap']”.

ܕܝܘܢܝܘܢ ܕܝܘܢܝܘܢ ܕܝܘܢܝܘܢ ܕܝܘܢܝܘܢ ܕܝܘܢܝܘܢ ܕܝܘܢܝܘܢ
..ܕܝܘܢܝܘܢ

Bar Hebraeus, a 13th century writer, gives the day and month of the earthquake:

“And on the twenty-third day of the month of *Elul* ... a severe earthquake took place in Armenia and the town of Dogodap was reduced to ruins. And there was a hard win-

ter in Melitene and red snow fell". [Budge's trans.]

Judging from the context of the sources, we think the date proposed by Bar Hebraeus to be reliable. The site of Tolotap' has not been definitely identified. The location suggested here is that proposed by Hewsens and Bandomer (1988).

▲ 1135 09 23

localities	lat.	long.	I
Tolotap'	39 40	41 44	IX

< 066 > 1137 October 19 – November 16 South-eastern Turkey

sources Ibn al-Qalanisi, *Dhayl*, p.263; Ibn al-Athir, *al-Kamil*, XI, p.43

literature Taher (1979)

catalogues d. *Ben-Menahem (1979)

catalogues p. Poirier and Taher (1980); al-Hakeem (1988)

In the year 1137, in the month of *Safar* [19 October – 16 November], there was a strong earthquake in an area covering present-day central and eastern Turkey and northern Iraq, causing massive destruction in many localities not specified in the sources, between Diyarbakir (Turkey) and Al-Mawsil (Mosul, Iraq).

The earthquake is recorded by Ibn al-Qalanisi, a contemporary Arab historian (who died in 1160 at Damascus), and by Ibn al-Athir, an Arab historian (1160-1231) who was a native of the area struck by the earthquake (Al-Mawsil).

The former records:

"The chronicles record a violent earthquake which struck Mesopotamia and the region of Mawsil in the month of *Safar* [19 October – 16 November]. It was said that the earthquake destroyed many other towns, causing the death of a large number of people".

ورد الخبر في صفر بأن زلزلة عظيمة جاءت بالجزيرة وأعمال الموصل وقيل إنها أهلكت عدة مواضع من الأرض وهلك فيها خلق كثير وافر من أهلها.

A similar statement appears in Ibn al-Athir:

"There was a strong earthquake in the Syrian territories and Mesopotamia, at Diyar Bakir and Mawsil, in Iraq and in other provinces".

كانت زلزلة عظيمة بالشام والجزيرة وديار بكر والموصل والعراق وغيرها من البلاد.

▲ 1137 10 19 – 11 16

localities	lat.	long.	I
■ south-eastern Turkey	37 17	41 44	IX-X

< 067 > 1138 October 11 – 1139 June Mount Quros [northern Syria]

▷ fissures ◁

sources 1 Mich. Syr., 16.9, *Chron.*, IV, pp.622-3; *Chron. ad 1234*, p.115; Ibn al-Qalanisi, *Dhayl*, pp.268-70; Ibn al-Athir, *al-Kamil*, XI, p.47; Ibn al-'Adim, *Zubdat*, II, pp.270-1

historiography Röhricht (1898); Runciman (1951-54); Baldwin M.W. (1969)

literature Taher (1979); Poirier *et al.* (1980); Guidoboni *et al.* (2004)

catalogues d. von Hoff (1840); Perrey (1850); Mallet (1853); Sieberg (1932a); Grumel (1958);

*Ben-Menahem (1979); *Ambraseys *et al.* (1994)

catalogues p. Poirier and Taher (1980); al-Hakeem (1988); Bektur and Alpay (1988); Ben-Menahem (1991); Khair *et al.* (2000)

History of the earthquake's interpretation

The first record of this sequence in the scholarly seismological tradition dates back to the first half of the 19th century: in fact, von Hoff (1840) recorded two strong earthquakes in his catalogue at the years 1138 and 1139 in a ill-defined area of the Middle East which included part of Syria (Aleppo), Mesopotamia and Iran. These items of information then passed unaltered into subsequent pre-1900 descriptive catalogues. In the 20th century, Sieberg (1932a) caused the earthquakes to become three, the first being brought forward to September 1137. And the first dating of the month and day started to appear. The tendency to date an earthquake to 1137 still persists in several second-generation (parametric) catalogues, published in more recent times (Ben-Menahem 1979; Poirier and Taher 1980; al-Hakeem 1988; Khair *et al.* 2000). Nevertheless, Ben-Menahem himself, in a subsequent paper (Ben-Menahem 1991), records a single large ($M_L = 7.4$) shock on 12 October 1139. Apart from this change in dating and the addition of previously unstated epicentral coordinates, descriptive data are the same as those contained in Ben-Menahem (1979) for the earthquake of 13 September 1137 (epicentral location to the NE of Aleppo, a shock felt from Mesopotamia to Egypt). Finally, the dating to 1138 reappears in Ambraseys *et al.* (1994).

Apart from these fluctuations in the chronological parameters, we also find other significant differences of interpretation in current catalogues. While, on the one hand, there is a certain agreement in indicating Aleppo as the worst affected location, on the other, there remain considerable uncertainties as to the number of earthquakes and their relative parameters (intensity and/or magnitude); and above all, there is a lack of a clear definition of the area of maximum effects. All these elements contribute to the creation of an even more confusing picture of this seismic sequence, even in the more recent catalogues.

In the main 19th century descriptive catalogues (von Hoff 1840; Mallet 1853) the city of *Gansana* is mistakenly listed among the locations struck by the earthquake of 1139, probably because of confusion arising between the Syrian events of 1138-1139 and the great earthquake that shook the Caucasian region on 30 September 1139 and destroyed the city (at that time in Persia) of Ganzak (also called *Ganza*), now Kirovabad in present-day Azerbaijan.

The variety of interpretations of the Syrian earthquakes of 1138-1139 in the seismological tradition mostly derives from the kinds of source used by the individual authors: Ben-Menahem (1979, 1991), Bektur and Alpay (1988), and Khair *et al.* (2000) base themselves on preceding works and historical catalogues, mostly published during the 20th century, from which they may well have inherited some of their gaps in information and interpretative errors. On the other hand, Poirier and Taher (1980) and al-Hakeem (1988) only use Arabic sources and thus obtain only a partial picture. The first of these catalogues is based on the chronicles of two important 12th century historians (Ibn al-Qalanisi and Ibn al-Athir) but, however authoritative and reliable they may be, they can only provide a partial reconstruction of the event, thus increasing the risk of mistaken parametric interpretations, because the picture obtained from the sources is incomplete. Ambraseys *et al.* (1994) supply only a partial image of these seismic events, because their catalogue is concerned with the seismicity of Egypt and Arabia and not of Syria.

The oscillations and uncertainties revealed by this excursus into the historical seismological tradition justify the following questions:

- i) was it a matter of one or more isolated shocks, as many catalogues seem to suggest, or was it really a seismic sequence?
- ii) if it was a seismic sequence, when did it start and how long did it last?
- iii) which area was struck and where was the epicentre?

The study presented here is based on Guidoboni *et al.* (2004) and aims to answer these questions.

Effects of the earthquakes

Between October 1138 and June the following year, there was a destructive seismic sequence in the present-day border territories between Turkey and Syria. The most seriously damaged area was in the region of Aleppo (Halab) in north-east Syria and the southern part of the Edessa (now Urfa) area in present-day south-east Turkey. The sources tell of the collapse of a number of places, of which six are explicitly identified: in the Aleppo area: Atharib (Al-Atarib), where there were 600 victims; Azrab, a village near Mt. Quros; Tall Ahmar on the left bank of the Euphrates near Jarabulus, and Zaradna (Sardona for the Latins, Zardana); Shaykh al Hadid; and in the Edessa area: Tall Halid (also called Trihalet).

Perhaps it is worth pointing out that the castles mentioned were very strongly built military structures, all situated on higher ground – a circumstance that could increase shaking effects. Houses collapsed over a wide area at Aleppo, the city walls were damaged, and the citadel as well.

Towers collapsed at Biza'ah, and a church collapsed at Harim, a town in northern Syria, now near the Turkish frontier.

Many of the shocks in the seismic sequence of 1138-1139, especially in October, were strongly felt as far south as Damascus, but no damage was caused there. In particular, three separate shocks were clearly felt at Damascus on 11 October 1138, the day on which the sequence began. The earthquake was not felt at Jerusalem, however. According to the Arab historian Ibn al-Athir (12th-13th century), the earthquakes were also felt in the region of Iraq (Mesopotamia). A total of 80 shocks were felt during the whole seismic sequence.

Near Callinicus (Ar-Raqqah), in the Syrian desert, the earthquake caused cracks and fissures to appear in the ground.

Historical sources

For the sequence of 1138-1139, Syriac and Arabic sources contributed significant information. The new texts, not used in previous studies, are two Syriac sources: Michael the Syrian and the *Chronicon ad annum Christi 1234*.

The main sources for this earthquake are the contemporary, first-hand reports of Michael the Syrian (1126-1199) and the Arab historian Ibn al-Qalanisi, who personally experienced the earthquake at Damascus. Valuable supplementary information — in some cases it is original — is to be found in the *Chronicon ad annum Christi 1234*, which dates to the first half of the 13th century, and the chronicle of Ibn al-Adim, an Arab historian from Aleppo (1192-1262). The information provided by Ibn al-Athir is expressed in more general terms.

Michael the Syrian records:

“In the year fourteen hundred and fifty (of the Greeks, 1138-1139), in the month of *Tishrin I* (= October) ... in the same month there was an earthquake, and the towers were destroyed in Biza'ah and Aleppo”.

ܡܝܚܐܝܠ ܡܫܘܪܝܢ ܕܥܝܢ ܗܝܘܢܐ ܕܠܝ ܩܐܡ ܕܡܝܘܨ ܡܘܨܐ ... ܩܐܡ ܕܡܝܘܨ ܡܘܨܐ ܕܡܝܘܨ ܡܘܨܐ
ܕܡܝܘܨ ܡܘܨܐ ܕܡܝܘܨ ܡܘܨܐ.

And he adds important effects upon the natural environment in the Syrian desert: “And in the desert near Qaliniqos [Callinicus], as forty men were walking on the road, the earth opened and swallowed them all. One survived, for he had turned aside to urinate. The sound of the groaning of the people and their horses rose for a long time. Atharib was also destroyed once again in this earthquake, and the church of Harim collapsed. And also Azrab, a village close to Mount Quros, was torn open in the centre, and when the inhabitants left, it collapsed completely.

There was drought in this year until the full moon of *Iyyar* (= March); so when the rain came, there was a late harvest”.

...
 ...
 ...

Ibn al-Qalanisi is especially precise when listing the various shocks felt in Damascus between 11 October 1138 and 21 June 1139; and the information he gathered about the Aleppo area, where the worst damage was suffered, was fairly precise, if somewhat brief:

"During the afternoon of Tuesday 4 *Safar* [11 October], there was a terrible earthquake at Damascus, causing the earth to shake three times. There were repeated further shocks the following Friday at the hour of sunset. During the first third of the night of Monday 19 *Safar* [27 October], the earthquake returned and the earth shook three times. Praise be to God and the manifest signs of his unfathomable power. There were more shocks during Wednesday night, and yet more in the last quarter of Friday night. Travellers and reliable witnesses have described these shocks in the north [of Syria]. It was at Aleppo and the surrounding area that the earthquake was strongest, causing a large number of houses to collapse, damaging the city walls and producing cracks in the citadel. The populace abandoned their homes in panic, and fled from the city. According to some exaggerated witness accounts, there were a hundred shocks; according to more reliable witnesses, the number of shocks was eighty, but God the Blessed, Lord of the universe, the Almighty, knows what in hidden and what is clear. In the early hours of the morning of Wednesday 21 *Shawwal* [21 June], there were some terrifying shocks which struck men's hearts with fear. [...] The chronicles record that the citadel of Al-Atharib was taken by 'Imad al-Din Atabik [the Seljukid governor of Mawsil] on Friday 1 *Safar* [9 October 1138], and they report a strong earthquake in Syria during the night of Friday 8 *Safar* [15 October]".

في يوم الثلاثاء الرابع من صفر جاءت في دمشق زلزلة هائلة بعد الظهر اهتزت به الأرض ثلاث مرات وتلاها في ليلة الجمع وقت عشاء الآخرة ثانية اهتزت بها الأرض عدة مرات. وفي ليلة الاثنين التاسع عشر من صفر عادت الزلزلة في الثلث منها ثلاث مرات. فتبارك رب هذه القدرة الباهرة والآية الظاهرة. وتناصرت الأخبار من الشقات السفار والواردين من ناحية الشمال بصفة هذه الرجفات المذكورة وأنها كانت في حلب وما والاها من البلاد والمعازل والأعمال أشد ما يكون بحيث أنهدم في حلب الكثير من

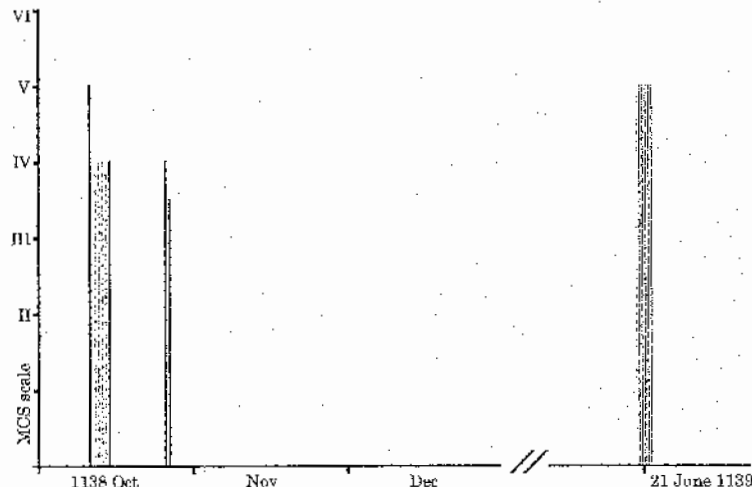


fig. 29 1138-1139 sequence: shocks felt at Damascus (from Guidoboni *et al.* 2004).

الدور وتشعث السور واضطربت جدران القلعة وظهر أهل حلب من دورهم الى ظاهرها من خوفهم على نفوسهم ويقول الكثير من الحاكي ان الزلزلة جاءت تقدير مائة مرة وقوم يحققون انها ثمانون مرة والله أعلم بالغيب والصواب تبارك الله رب العالمين القادر على كل شيء. وعلى مضي ساعات نهار الأربعاء والحادي والعشرين من شوال جاءت رجفة هائلة ارتاعت لها القلوب ورجفت بها الصدور. وقد كان الخبر قد ورد قبل ذلك بافتتاح عماد الدين أتابك قلعة الأثارب في يوم الجمعة أول من صفر من السنة المقدم ذكرها ووردت الأخبار بأن رجفة عظيمة حدثت في الشام بعد ما تقدم ذكرها في ليلة الجمعة الثامن من صفر منها .

The *Chronicon ad annum Christi 1234* provides briefer information, and also places the earthquake a year earlier, in 1137-1138; but the evidence it offers is still useful, particularly because it helps to establish a southern limit to the felt area by recording that the earthquake was not felt at Jerusalem:

“At this point in the year fourteen hundred and forty-nine (of the Greeks, 1137-1138) there was a severe earthquake; many towns were reduced to ruins, especially in Cilicia and the Syrian territories. The strong fort of Atharib was thrown down to earth as if it had never existed. But (the vibrations) did not reach Jerusalem”.

كانت احوال حلب في سنة اربع مائة واربعة وثمانين من الهجرة النبوية في شهر صفر من سنة الف واربعمائة من الهجرة النبوية في ليلة الجمعة الثامن من صفر منها .

Ibn al-'Adim, an Arab historian who was born at Aleppo in 1192 and died in 1262, provides a detailed account of the seismic sequence of 1138-1139, including the names of some affected places which are not recorded in the other sources (Shih, Tall 'Ammar, Tall Khalid and Zaradna):

“On Thursday 13 *Safar* [22 October], there was a violent earthquake, followed by more shocks. The people of Aleppo fled from the city into the countryside. Pieces of stone were thrown out of walls and plunged into the street and people heard deafening rumbling noises. The citadel of Al-Atharib collapsed on top of 600 Muslims; only the governor and a few others survived. Many places were destroyed: Shih [Shaykh al Hadid], Tall 'Ammar, Tall Khalid and Zarradna. The earth was seen to sway, and the trees shook like corn in a sieve. Many houses were destroyed at Aleppo, and the city walls were damaged. Those of the citadel also suffered. [Imad al-Din] Atabik [al-Zanki], coming from the east, took the city, made his way towards the citadel and proceeded in the direction of Mawsil. The earthquakes continued until the month of *Shawwal*; it was said that there were 80 shocks”.

في يوم الخميس ثالث عشر من صفر حدثت زلزلة شديدة ثم اتبعها أخرى وتواصلت الزلازل فهرب الناس من حلب الى ظاهر البلد وخرجت الأحجار من الخيطان الى الطريق وسمع الناس دويًا عظيمًا وانقلبت الأثارب فهلك فيها ستمائة من المسلمين وسلم الوالي ومعه نفر يسير. وهلك أكثر البلاد من شيوخ وتل عمار وزردنا وشوهدت الأرض موج والأحجار عليها تضطرب كالحنطة في الغربال. وانهدم من حلب دور كثيرة وتشعثت السور واضطربت جدران القلعة وسار أتابك مشرقًا فنزل القلعة فأخذها وسار منها الى القلعة ثم سار الى الموصل. وتواترت الزلازل الى شوال وقيل ان عدتها كانت ثمانين زلزلة.

Only very brief information about the earthquake is provided by Ibn al-Athir. He records that:

“There were many terrible earthquakes in the Syrian territories, Mesopotamia and many other provinces; but the most violent were in the Syrian territories, where they lasted for many nights, accompanied by tremendous rumbling and shaking”.

كانت زلازل كثيرة هائلة بالشام والجزيرة وكثير من البلاد وكان اشدّها بالشام وكانت متوالية عدة ليال وكان معها صوت وهزة شديدة.

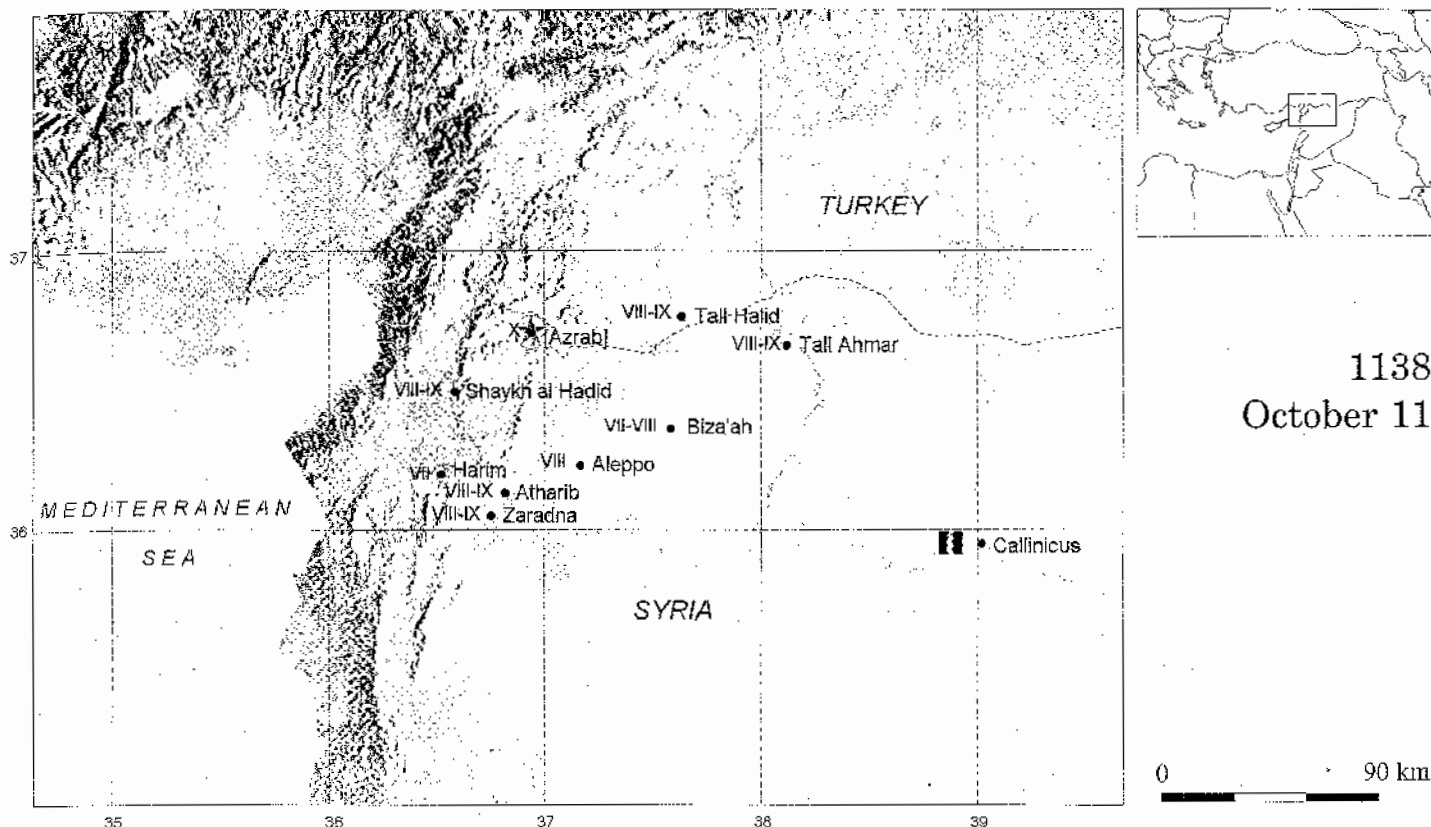


fig. 30 (elaborated after Guidoboni *et al.* 2004).

As regards the Latin sources, we feel it is safe to say that the news of these earthquakes had a poor circulation or reception in Crusader areas, although they were partly affected, as well as in the Western Europe. We have to bear in mind that the area was strongly disturbed by troop movements and by local uprisings, as well as by raids to obtain control of the territory: the imperial Byzantine army was positioned at that time on the plain of Antioch and had encamped on the northern part of the River Orontes; and the Byzantine war machines 'bombarded' Antioch for days on end (Runciman 1951-54).

The years in question coincide with the start, in 1137, of Zinki's counterattack against the fortresses of Ba'rin, Al-Ma'arra and Kafar Tab, which led to a rupture with the Franks. And it was Ibn al-Athir himself who referred to those years with these words: "The populations ... were reduced to squalor and misery for those places were the theatre of military operations, and so lootings and killings were very much a day-to-day affair".

But even fortuitous contingencies may play a role in the dissemination of news. Practically nothing of interest is to be found in European annals of the 12th and 13th centuries or the Latin texts in the history of the crusades corpus corpus for the history of the Crusades. In particular, William of Tyre, who wrote in the second half of the 12th century, made no mention of these earthquakes, perhaps more attracted by the military events that were taking place. It is likely that some echo of these events may be contained in a record of an earthquake, couched in very general terms, in the Benedictine annals of the abbey of Göttweig (*Annales Gotwicenses*), in the diocese of Passau (north-eastern Austria).

The text gives the date as the fourth day before the Calends of October (i.e. 28 September) and the location as "in certain places" (*in quibusdam locis*). So we can-

not exclude the possibility that not only a local earthquake but also events in far-off lands are being referred to, though without the oral transmission of information offering much detail. This source adds no information to the data contained in the Arabic and Syriac sources.

▲ 1138 10 11 ☉ = 36 43 36 56 I ₀ = IX Me = 6.0 Sites: 11 EE: 1								
localities	lat.	long.	I	localities	lat.	long.	I	
[Azrab] SYR	36 43	36 49	X	Aleppo SYR	36 14	37 10	VIII	
Al-Atarib SYR	36 08	36 49	VIII-IX	Biza'ah SYR	36 22	37 35	VII-VIII	
Tall Halid TK	36 46	37 38	VIII-IX	Harim SYR	36 12	36 31	VII	
Tall Ahmar SYR	36 40	38 07	VIII-IX	Damascus SYR	33 30	36 19	V	
Shaykh al Hadid SYR	36 30	36 35	VIII-IX	Jerusalem	31 46	35 14	NF	
Zaradna SYR	36 03	36 45	VIII-IX	Ar-Raqqa SYR	35 57	39 01	EE	

< 068 > 1139 September 30 Ganzak [Azerbaijan]

▷ landslides, the obstruction of streams, the formation of lakes, oil rising to the surface and burning ◁

- sources 1 Step'annos, in Alishan (1893, p.232); colophon in Yovsep'ean (1951, no.166, cols.351-354); Sam. An., *Comp.*, p.132; Nezami Gan., *Ishandar-nama*, p.33; Bar Hebr., *Chron.*, pp.302ff.; Mxit. Gosh, *Chron.*, p.361; Kyr. Gan., *Hist.*, pp.108ff.; Step. Orb., *Hist.*, II, p.87
- sources 2 Mxit. Ayriv., *Hist.*, p.63; Vard. Ar., *Hist.*, p.123; Yovh. Imast., *Work*, p.133; Ibn al-Athir, *al Kamil*, XI, p.77; al-Isfahani, *Rec.*, II, p.190; al-Suyuti, *Kashf*, p.24
- historiography Incicean (1822); Brosset (1870-71); Minorsky (1951); Dowsett (1958); Cuneo (1988)
- literature Abich (1882); Taher (1979); Nikonov and Nikonova (1986); Nikonov (1987); Nikonov (1991)
- catalogues d. von Hoff (1840); Perrey (1850); Mallet (1853) Kostancanc' (1902); Sieberg (1932a); Step'anyan (1964); *Ambraseys and Adams (1989); Zeyt'unyan (1991); Guidoboni and Traina (1995)
- catalogues p. Poirier and Taher (1980); Kondorskaya and Shebalin (1982); al-Hakeem (1988); Bektur and Alpay (1988); Karapetian (1991); Shebalin and Tatevossian (1997); Berberian (1997); Piroussian (1997)

On 30 September 1139, a disastrous earthquake destroyed the city of Ganzak (also called Elizavetpol' or Kirovabad; now Ganca) in Azerbaijan, causing widespread destruction in its province of Arjax. At that time, the city of Ganzak was occupied by the Seljukids. It was almost completely destroyed, and the churches of St. Gregory and St. Sargis suffered total collapse. According to various sources, there was a very large number of victims at Ganzak: reports give figures varying between 230,000 and 300,000. These figures are exaggerated, however, for they do not fit the population levels for the area, and must therefore simply be taken as an indication that the death toll was very high.

The earthquake also caused the total collapse of the church at Halbat and the collapse of the roof of the church at Tat'ev. A number of other towns were also destroyed in the ancient cantons of P'arisos and Xac'en, which became the province of Arjax.

The earthquake also had substantial environmental effects: we are told that there was a landslide at Ganzak, causing the collapse of the church of St. Gregory and that of St. Sargis; and oil was seen to rise to the surface and burn near the city. The earthquake triggered a massive landslide on Mt. Alharak which obstructed a river, thereby creating an expanse of water still in existence a century after the earthquake, as reported by the 13th century chronicler Kyriakos of Ganzak (Kirakos Ganjakeci).

The earthquake is recorded in primary Armenian sources of the time, and made a deep

"On 18 Areg [1 October], during the night of Friday to Saturday, on the day of the feast of St. George [30 September], the fury of the wrath of God fell upon the world; the violence of the earth and powerful destruction came with terrible shocks which reached this land of Albania, in accordance with which it is written: 'Who moves this our nether [world] to its foundations, and the pillars thereof tremble' [Job. 9:6]; and similarly in another [passage]: 'Who looks at the earth and makes it tremble' [Ps. 103/104:32]. This earthquake caused much destruction in many places in the cantons of P'arisos and Xac'en, as well as in the fields and mountains. It also caused the capital Ganzak to be dashed into Hell, swallowing up its inhabitants; for on all sides of its surface it hugged them to its bosom, and in the mountain regions many fortresses and villages were demolished together with monasteries and churches, which collapsed on the heads of their inhabitants, and innumerable people were killed by the destruction of buildings and towers. And this came to pass in the year 588 of the Armenian era [15 February 1139 - 14 February 1140]".

Յամսեանն արեգի որ օր ութելուսսան էր ամսոյն, ի գիշերի ուրբաթու ի լուսանալ շաբաթուն, յորում առ ուր տօն էր Սրբոյն Գէորգայ, զարթեալ ցասումն բարկութեան Աստուծոյ ի վերայ աշխարհի՝ ի բռնութենէ հողմոց, և շարժեալ անհնարին դողմամբ սաստիկ կործանումն հասուցանելով աշխարհին Աղուանից, ըստ գրելումն, թէ, "Ո շարժէ զառ ներքոյն երկրի ի հիմանց, և սիւնք նորա դողան. և ըստ միւսումն, Ո հայի յերկիր և տայ դողալ սմա": Որով շարժմամբ բազում աւերուած լինէր ընդ բազում տեղիս ի գաւառիս Փառխասոյ և Խաչինոյ, առ հասարակ ի դաշտս և ի լեռինս. յորում և մայրաքաղաք Գանձակ առ հասարակ յանդունդս կործանիցի, խորատոյ՞ առնելով զբնակիչս իւր. քանզի չորս կողմ երեսաց նորա ամփոփեաց զնոսա ի ծոց իւր. և ի լեռնակողմանս բազում դղեակք և գիւղք տապալեցան հանդերձ վանորայիւք և եկեղեցոք, որք փլան ի վերայ գլխոյ բնակչաց իւրեանց. յորում և անթիւք սատակեցան ի կործանմանէ շինուածոց և աշտարակաց. և լինէր այս ի ՇՁԳ, թուականին Հայոց.

P'arisos and Xac'en are the ancient names of cantons in the province of Arjax, which corresponds in large part to the present-day Autonomous Region of Nagorno-Karabakh in southern Azerbaijan (*Lrnayin Larabal*, cf. Dowsett, 1958, p.482, nos.3 and 4).

Kyriakos of Ganzak (13th century, p.108ff.) reports:

"In the year 588 [15 February 1139 - 14 February 1140], there was a strong earthquake which destroyed the city of Ganzak, and its buildings collapsed on top of its inhabitants. Demetrius, king of Iberia, father of Davit' and Geworg, came and took away the gates of the city to his country. The mountain of Alharak collapsed in the earthquake and blocked a stream which crossed it, turning it into a lake which still exists to this day. Excellent fish are to be found there".

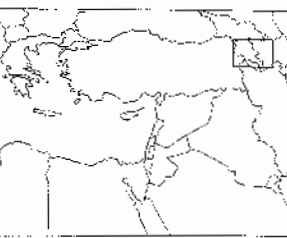
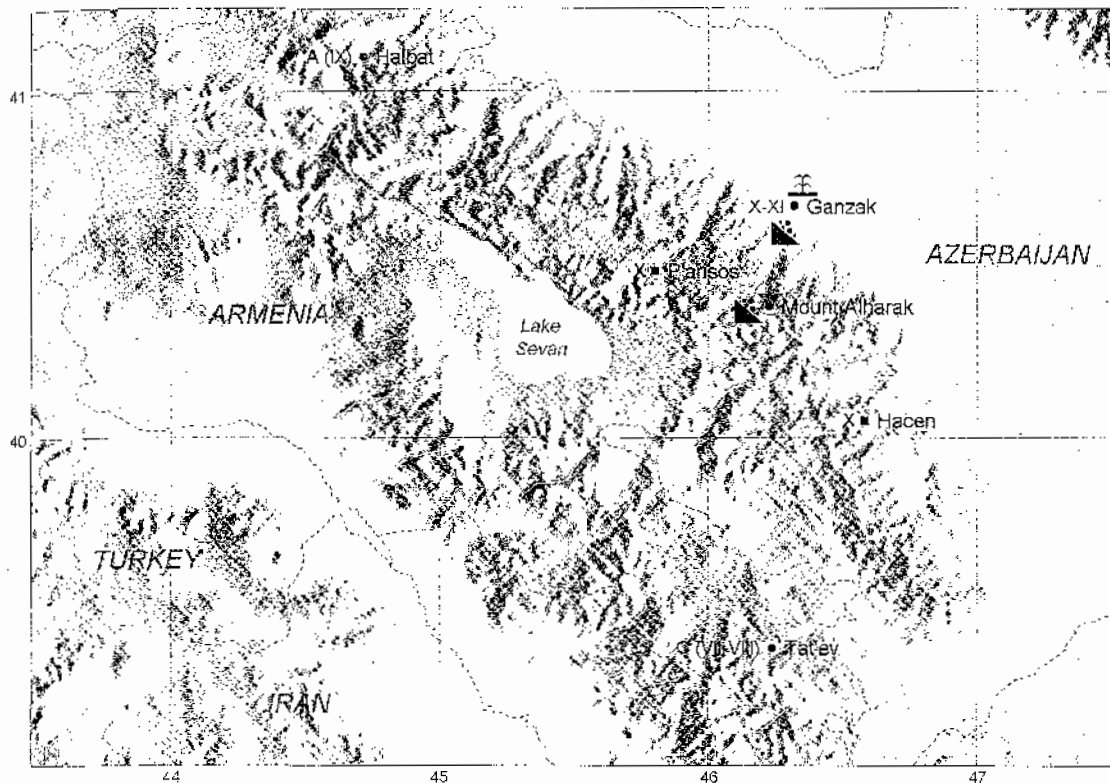
Ի ՇՁԸ թուականին եղեւ շարժ սաստիկ և կործանեցաւ քաղաք Գանձակ, և տապալեցան շինուածք որ ի նմա, ի վերայ բնակչաց իւրոց. և եկն թագաւոր վրաց Դեմետրէ հայրն Դաւթի և Գէորգեայ, և տարաւ զդրունս քաղաքին յաշխարհն իւր. փլաւ և լեռն Ալհարակ ի շարժմանէն և արգել զձորակն որ անցանէր ընդ մէջ նորա. և եղեւ ձովակ, որ է մինչեւ ցայսօր. լինին ի նմա ձկու նք ազնիւք.

He repeats this information a little further on, and also quotes the report of the earthquake given by Samuel of Ani.

Step'annos Orbelean (13th century), records the earthquake as occurring in the year 587 [15 February 1138 - 14 February 1139], at the time of Ter Grigor, patriarch of Siwnik', and states:

"The roof of the large church of Tat'ev collapsed entirely and fell on St. Gregory, and hence on the *gavit*' which stood in front of its door, causing it to collapse".

և գմբէթն մեծ եկեղեցւոյն ի Տաթեւ բոլորապոյր շրջեկան թռեալ ի վերայ սուրբ Գրիգորոյն և գաւիթ որ ի դրանն կայր. և փլոյց առ հասարակ:



1139
September 30

0 60 km

fig. 31

Further on, Orbelcan mentions the restoration of the dome of the church of the Holy Apostles at Tat'ev in the second half of the century; but it is not certain whether the damage in question was caused by an earthquake. Mxit'ar Ayrivanec'i (13th century, p.63) dates the earthquake to the year 590 (1141-1142), whereas Vardan Arcwelc'i (13th century, ch.72, p.123) gives the date as 588.

The event is also reported by Yovhannes Imastaser (13th century, p.133). The Arabic chroniclers al-Isfahani (12th century, II, 190 = 533 H.) and Ibn al-Athir (12th-13th century, 11/77) do not agree as to the number of victims. The former gives the date as 8 September and records 300,000 victims; the latter, like Bar Hebraeus, reports 230,000 victims. There is information about the sources in Dowsett (1958). Taher (1979, p.308) dates an earthquake at "Janza" to March 1143 on the basis of al-Suyuti (*Kashf*, p.24).

As for the Persian poem *Iskandar-nama*, the reference to the earthquake is reported in the (non-critical) edition by V.Dastgard (p.33) where the poet seems to refer to a prince called "Pisxin", who is said to have restored the city of Ganza, struck by an earthquake "on the eve of Saturday". The poem was in fact dedicated to the *atabek* Abu Bakr, who died in 1210, but the final verses glorify a third prince, who is not easily identifiable. Minorsky (1951) argued that this part of the poem had been rewritten, but that in any case the original version referred to the *atabek* Abu Bakr and his son Pishxin, who can be identified as the "Beshken the Brave" of the *Georgian Chronicle*.

▲ 1139 09 30 at night ⚡ = 40 24 46 14 I₀ = X M_e = 6.3 Sites: 5 EE: 2

localities	lat.	long.	I	localities	lat.	long.	I
Ganza AZ	40 40	46 19	X-XI EE	Halbat ARM	41 06	44 43	A (IX)
■ Parisos area AZ	40 29	45 48	X	Tat'ev ARM	39 23	46 14	C (VII-VIII)
■ Xac'en area AZ	40 03	46 35	X	Mount Albarak AZ	40 23	46 14	EE

< 069 > 1140 October 29 Melitene area? [south-eastern Turkey]

source Mich. Syr., 16.9, Chron., IV, p.623
historiography Elisséeff (1967)
literature comets: Oppolzer (1887, 1962)

This earthquake is unknown to the seismic catalogue tradition.

Michael the Syrian, a contemporary monk, mentions that there was an earthquake on 29 October 1140, but does not specify the location or effects. Since he was a native of Melitene, which stood near present-day Malatya (south-eastern Turkey), became archimandrite at the monastery of Bar Sauma, which was situated near Melitene, it seems reasonable to suppose that the earthquake struck the Melitene area.

He writes:

"And in the year fourteen hundred and fifty-two [of the Greeks, 1 October 1140 – 30 September 1141], on 29 *Tishrin I* [October], there was an earthquake".

ܠܝܝ ܟܝܘܢ ܡܢ ܝܘܡ ܕܝܘܢܝܢ ܕܝܘܢܝܢ ܕܝܘܢܝܢ

Since there are no specific references to serious consequences, the earthquakes were presumably weak.

Michael the Syrian goes on to mention an eclipse of the moon on 10 of the same month. Some doubt is cast on the chronology of events by the fact there was no eclipse of the moon in the period 1 October 1140 – 30 September 1141. Oppolzer (1887, 1962, p.361) lists an eclipse of the moon on 28 September 1140. There was another on 9 October 1139 — a day and month which almost coincide with the date given by Michael the Syrian, but with a difference of one year.

△ There are no elements with which to indicate the parameters.

< 070 > 1143 November 26 Prusa [north-western Turkey]

▷ interrupted flow of the river water ◁

source Mich. Syr., 17.1, Chron., IV, p.628
catalogues d. Ambraseys and Finkel (1991)

On 26 November 1143, an earthquake damaged buildings at Prusa (Bursa). For three days it stopped the flow of water in the river which crossed the town. Three days after the first shock, there was another.

The source is Michael the Syrian, a contemporary writer:

"In the year fourteen hundred and fifty-five [of the Greeks, 1 October 1143 – 30 September 1144], on 26 *Tishrin II* [October], early on Friday, there was an earthquake, and in the town of Prusa, near the Imperial city of Constantinople, it damaged buildings and injured their inhabitants. And the river which passes through the city completely dried up. And three days later, as those who were left had gathered and were standing in prayer, there was another earthquake and the river gushed out again and flowed in its bed".

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▲ 1143 11 26

localities	lat.	long.	I
Bursa	40 11	29 04	VII-VIII

<071> 1145 May 24 Melitene area? [south-eastern Turkey]

source Mich. Syr., 17.4, Chron., IV, p.633
catalogues p. al-Hakeem (1988)

Michael the Syrian, a contemporary writer, mentions that there was a strong earthquake on 24 May 1145, but he does not specify the location or effects. Since he was a native of Melitene, which stood near present-day Malatya (south-eastern Turkey), became archimandrite at the monastery of Bar Sauma, which was situated near Melitene, it seems reasonable to suppose that the earthquake struck the Melitene area. He writes: "In the year fourteen hundred and fifty-six [of the Greeks, 1 October 1144 – 30 September 1145)... and on 24 *Tyar*, the feast of the Ascension [24 May], there was a strong earthquake".

..ܟܘܪܝܢ ܕܠܝ ܟܘܪܝܢ ܟܘܪܝܢ ܟܘܪܝܢ ܟܘܪܝܢ ܟܘܪܝܢ ܟܘܪܝܢ ܟܘܪܝܢ ܟܘܪܝܢ

△ There are no elements with which to indicate the parameters.

<072> 1149 December 29 Melitene area? [south-eastern Turkey]

source Mich. Syr., 17.12, Chron., IV, p.649

This earthquake is unknown to the seismic catalogue tradition. Michael the Syrian, a contemporary writer, mentions that there was an earthquake on 29 December 1149, but he does not specify the location or effects. Since he was a native of Melitene, which stood near present-day Malatya (south-eastern Turkey), became archimandrite at the monastery of Bar Sauma, which was situated near Melitene, it seems reasonable to suppose that the earthquake struck the Melitene area. He writes: "On the twenty-ninth of *Canun I* [December] of the year fourteen hundred and sixty-one [of the Greeks, 1 October 1149 – 30 September 1150], the earth shook in an earthquake".

..ܟܘܪܝܢ ܕܠܝ ܟܘܪܝܢ ܟܘܪܝܢ ܟܘܪܝܢ ܟܘܪܝܢ ܟܘܪܝܢ ܟܘܪܝܢ ܟܘܪܝܢ

Since there are no specific references to serious consequences, the earthquake was presumably weak.

△ There are no elements with which to indicate the parameters.

<073> c.1150 Palestine

source Phocas, *Descript.*, pp.952, 956
historiography Pringle (1993-98)
catalogues d. Sieberg (1932a); *Ben-Menahem (1979); Amiran *et al.* (1994)

An earthquake which presumably occurred around the mid-12th century (or perhaps earlier), struck a limited area of Palestine between Jericho and Jerusalem. All we know is that it destroyed the two monasteries of St.John the Baptist and Mar Elias. The monastery of St.John the Baptist (who is known in Greek as the *Prodromos*), was built in the 6th century on the site where Christ was traditionally held to have been baptised. It stands near Jericho on the west bank of the Jordan, at a place now known as Qasr al-Yahud. The Greek Orthodox monastery of Mar Elias was founded in the 6th century and rises like a fortress on a hill 5 km north of Bethlehem on the road to Jerusalem. The only source to record the destructive effects of this earthquake is John Phocas, who wrote a description of the Holy Land. He himself visited the places he describes during a pilgrimage in 1185. In his *Description* of the Holy Land he writes:

"The monastery of the *Prodromos* [Precursor] was completely destroyed in an earthquake. But it has recently been rebuilt thanks to the munificence of our emperor, crowned by God, Manuel Porphyrogenitus and Comnenus, because its hegumen spoke freely to him about its reconstruction".

ἡ μὲν τοῦ Προδρόμου μονὴ ἐκ βάρων ὑπὸ σεισμοῦ ἀναστραφεῖσα, νῦν ὑπὸ τῆς πλουτοδότιδος δεξιᾶς τοῦ θεοστεφοῦς ἡμῶν αὐτοκράτορος τοῦ Πορφυρογεννήτου καὶ Κομνηνοῦ Μανουὴλ ἐκ καινῆς ἀνωκοδομήθη, τοῦ ταύτης καθηγητοῦ τῆ ἀνεγέρσει τούτου παρρησιάζεσθαι

Later on in the same work, Phocas writes as follows of the monastery of Mar Elias: "[This monastery] was built by men of religion in a very distant age, but it was later totally destroyed in an earthquake. That universal benefactor, my lord and emperor [Manuel I Comnenus], completely rebuilt it in response to the requests of the Syrian who was its abbot".

μονὴ τοῦ ἁγίου προφήτου Ἡλίου, ὑπὸ τῶν παλαιάτων μὲν ἀνεγερθεῖσα ἀνδρῶν θεοφιλῶν, ἐκ δὲ τοῦ σεισμοῦ ριζόθεν καταπεσοῦσα· ἀλλὰ καὶ ταύτην ὁ κοσμικὸς εὐεργέτης, ὁ ἐμὸς δεσπότης καὶ βασιλεὺς ἐκ βάρων ἀνήγειρε διὰ τοῦ ταύτην ἐπιστατοῦντος Σύρου ἀνδρός.

John Phocas's text is somewhat obscure as regards the date of the earthquake, the only chronological clue in his narrative being the *terminus ante quem* provided by the known time when the monasteries were rebuilt, that is to say during the reign of the Byzantine emperor Manuel I Comnenus (1143-1180). Ben-Menahem (1979) and Amiran *et al.* (1994) date the earthquake to 1160; Pringle (1993-98) expresses a series of doubts about the dating, but does not offer a solution to the problem. For lack of any reliable information, we think it appropriate to adhere to an approximate dating around the mid-12th century.

▲ 1150 c.

localities	lat.	long.	I	localities	lat.	long.	I
Mar Elias	31 44	35 13	A (IX)	Qasr al-Yahud	31 50	35 31	A (IX)

< 074 > 1151 September 28 Busra [southern Syria]

< 075 > 1152 February 1 Busra

source Ibn al-Qalanisi, *Dhayl*, p.317
 literature Taher (1979)
 catalogues d. Sieberg (1932a); Amiran *et al.* (1994)
 catalogues p. Poirier and Taher (1980); al-Hakeem (1988)

On 28 September 1151, there was a strong earthquake in southern Syria, the most serious damage being in the provinces of Busra (now Busra ash Sham) and Hawran. We are told that in Busra, house walls collapsed. Other three earthquakes were felt on 1 February 1152, but it did not cause any serious damage. Our source for this earthquake is Ibn al-Qalanisi, an Arab historian who died in 1160:

"News arrived of an earthquake during the night of 13 *Jumada II* in the year 546 [H. = 28 September 1151] which caused the earth to shake three times in the provinces of Busra and Hawran and the surrounding areas. House walls collapsed at Busra and elsewhere. The earthquake then subsided, halted by Him the Most High, the Omnipotent who had summoned it. On Saturday 22 *Shawwal* in that year [1 February

1152], the third day of the month of *Shebat*, shortly before dawn, there was an earthquake which caused the earth to shake three times; houses and their walls were shaken, but then the earthquake subsided by the will of God the Praiseworthy".

وردت الحكايات بحدوث زلزلة واقت في الليلة الثالثة عشر من جمادى الآخرة سنة ٥٤٦ هـ اهتزت الأرض لها ثلاث رجفات في أعمال بصرة وحران وسكنت وما والاها في سائر الجهات وهدمت عدة وافرة من حيطان المنازل ببصرة وغيرها وسكنت بقدره من حركتها وسكنها سبحانه وتعالى انه على كل شيء قدير. وفي يوم السبت الثاني والعشرين من شوال من السنة وهو اليوم الثالث من شباط واقت قبيل الظهر زلزلة اهتزت لها الأرض ثلاث هزات هائلة وتحركت الدور والجدران ثم سكنت بقدره الله تعالى ذكره.

▲
1151 09 28 at night

localities	lat.	long.	I	localities	lat.	long.	I
■ Busra ash Sham	32 31	36 29	VIII	■ Hawran	32 45	36 30	VI-VII?

1152 02 01 4:00 UT

localities	lat.	long.	I	localities	lat.	long.	I
■ Busra ash Sham	32 31	36 29	V-VI?	■ Hawran	32 45	36 30	V?

- < 076 > 1156 October 13 Afamiyah eastern and northern Syria
- < 077 > 1156 December 9 Aleppo
- < 078 > 1157 April 2 Afamiyah
- < 079 > 1157 July 5 Afamiyah
- < 080 > 1157 August 9 - September 7 Tall Harran ▷ fissures ◁

sources Ibn al-Qalanisi, *Dhayl*, pp.334-6, 338, 342-4, 346, 348-9, 352, 354, 357; Ibn al-Jawzi, *al-Muntazam*, X, p.176; Ibn al-Athir, *al-Ta'rikh*, p.110; Ibn al-'Adim, *Zubdat*, II, p.308; Abu Shama, *al-Rawdatayn*, I, pp.103-4, 120; Greg. Priest, *Chron.*; Rob. Torig., *Chron.*

inscription RCEA, IX (1937) pp.13-4, no.3220; Ciccarello (1996)

historiography Rey (1871); Molin (2001)

literature Ambraseys (1970); Poirier *et al.* (1980); Ambraseys and Barazangi (1989); Ambraseys and Jackson (1998); Guidoboni *et al.* (2004)

catalogues d. Bonito (1691); von Hoff (1840); Perrey (1850); Mallet (1853); Sieberg (1932a); Grumel (1958); *Ben-Menahem (1979, 1991); Amiran *et al.* (1994)

catalogues p. Ergin *et al.* (1967); Poirier and Taher (1980); al-Hakeem (1988); Bektur and Alpay (1988); Khair *et al.* (2000)

History of the earthquake's interpretation

Between late September 1156 and late May 1159, a long and destructive seismic sequence struck an area comprising present-day north-west Syria, northern Lebanon and the region of Antioch (Antakya, in Turkey). The duration and destructiveness of this long seismic sequence, as well as the breadth of the affected area, have contributed to the event's being remembered and passed down to subsequent centuries. These earthquakes entered the cultural and erudite European tradition, and therefore the early earthquake catalogues. It is first recorded in Italian texts dating back as far as the end of the 17th century (Bonito 1691). Since then, nearly all historical seismic catalogues of the eastern Mediterranean, both descriptive and parametric, record great earthquakes in the Middle

East in the mid-12th century.

Re-tracing the seismological tradition of the last two centuries, we do indeed encounter substantial fluctuations in the chronological parameters (the date varies between 1152 and 1160), which in some cases have generated earthquakes that in actual fact never happened ("false" earthquakes). Moreover, the affected area is poorly defined and therefore appears broader than it actually was. But perhaps the most important factor is that this seismic sequence has for a long time been badly interpreted and considered as a single earthquake, or at most as two or three separate events, never related to one another and with enormous uncertainties regarding the location of their epicentre. As a consequence, an understanding of the real nature of these important earthquakes has been lost: it is no longer appreciated that this was a very long series (it lasted more than two and a half years) of hammer blows, all originating across a well-defined area. It is only in some recent catalogues that the seismic sequence 1156-1159 started to appear and to be interpreted as such. The first was that of Poirier and Taher (1980), who recorded numerous and detailed data, listing the chronology of the shocks felt at Damascus. The reconstruction of this chronology is based on the long and accurate narrative of the contemporary Arab historian Ibn al-Qalanisi, a direct witness of the Damascus earthquakes. In Poirier and Taher's table, however, the chronological conversion of the list of shocks from the Muslim dating system (the Hegira calendar used by the original Arabic source) to the Julian calendar (the dating system in force in the Western world until 1582, the year of the Gregorian reform) proves to be inaccurate. The other catalogue that records a long series of shocks in Syria between 1156 and 1159 is that of al-Hakocm (1988). The first event is dated to 19 May 1156 (grade V MM), while the end of the seismic sequence coincides with that indicated by Poirier and Taher (6 June 1159, grade VI MM); the most violent earthquake (no.163) is dated to 15 July 1157, with intensity XI MM.

From certain points of view, the catalogues and studies of the last decade have shown a kind of return to the past: they contain no further references to this seismic sequence; when two or three earthquakes are listed, they do not seem to be related to one another. Ben-Menahem (1991) only reports one large event dated to 15 August 1157, with $M_L = 7.3$, $I_0 = X$ and epicentre at 35.1 N and 36.3 E. Thus, compared to his first catalogue (Ben-Menahem 1979) and to the earthquake of 12 August 1157 listed there, the author alters both the date and the epicentral coordinates, whereas the descriptive data remain substantially the same. In Amiran *et al.* (1994) the data are above all taken from preceding catalogues (including that of Ben-Menahem 1979) and from Arabic sources. Two earthquakes are listed: event no.1 is dated at 19 May 1156 and is located in the Turkish-Iraqi area, thus coinciding with the first earthquake indicated by al-Hakeem (1988), while event no.2 is dated to 12 August 1157 and is located in Syria with destructive effects; both earthquakes were strongly felt as far away as Palestine.

The most recent available catalogue is that of Khair *et al.* (2000), which consists of a list of all known strong ($M_s \geq 5.9$) earthquakes that occurred along the DSTFS (Dead Sea Transform Fault System) over the last four millennia. It was compiled as an integral part of a study which aimed to attempt a subdivision of the DSTFS into five seismogenic zones. The data it contains, however, are based only on previous works and historical catalogues (including some of those cited here, such as Ben-Menahem 1979 and 1991; Poirier and Taher 1980, etc.), and not on original sources. Like Amiran *et al.* (1994), the authors list a few earthquakes which do not seem to be related to one another. In the seismic zonation of the DSTFS proposed in this work, events nos.1 and 3 (dated to 5 October 1156 and 15 August 1157 respectively) are both located in the Al-Ghab seismogenic zone (western Syria), while event no.2 is dated to 15 July 1157 and is located in the Bekaa valley seismogenic zone (Lebanon). For events 2 and 3 both magnitude estimates and epicentral coordinates are provided. It is worth noting that event 3 is the one also reported by Ben-Menahem (1991), while event 2 coincides with the shock indicated as

the strongest earthquake of the 1156-1159 sequence (event no.163) by al-Hakeem (1988), with the remarkable difference that according to Khair *et al.* (2000), it was not the most violent ($M_L = 6.1$), as the earthquake of 15 August 1157 (event no.3) was much larger ($M_L = 7.3$).

Among more recent studies, Ambraseys and Jackson (1998), on the basis of a previous unpublished catalogue and some data for which they provide no references, report a very large event of M_s 7.8 on 12 August 1157 in the area of Hamah (Syria), with epicentral coordinates 35.0 N and 36.5 E. The earthquake is thus the same as that indicated by Ben-Menahem (1979) and Amiran *et al.* (1994). In an earlier study (Ambraseys and Barazangi 1989) Ambraseys reported, among the large historical events along the northern part of the Dead Sea Fault System, an earthquake of magnitude greater than 7.0 at Hamah on 15 August 1157; hence, as has just been seen, it corresponds both to the event listed two years later by Ben-Menahem (1991), and to the shock reported as event no.3 by Khair *et al.* (2000). In comparison with the past, then, the studies carried out over the last 25 years have definitely brought about a significant improvement in our knowledge of the Syrian earthquakes of 1156-1159. However, from what has been said above it emerges that even today numerous uncertainties and discrepancies persist among the various authors. Some of these (Poirier and Taher 1980; al-Hakeem 1988) record a long series of shocks, but seem to be in disagreement as to the starting date of the seismic sequence, while other authors (Ben-Menahem 1979; Bektur and Alpay 1988; Amiran *et al.* 1994; Khair *et al.* 2000) only indicate two or three large earthquakes (but Ben-Menahem 1991, records only one shock), apparently independent of each other and with different epicentral areas. Furthermore, both the most severely damaged area and the felt area still appear to be poorly defined.

For the sequence from 5 October 1156 to 6 June 1159, Poirier and Taher (1980, Table 1) record only Damascus and Hamah as located sites. Ben-Menahem (1991) supplies little information about the areas and locations struck: he gives some general indications of destruction in Syria and Lebanon, in Hamath (Hamah) and Damascus, and more accurate information for Baalbek only. At any rate, all the authors list some epicentral coordinates: they thus interpret the various effects as being due to a single earthquake, thereby significantly overestimating its magnitude. On the other hand, these are not indicated in al-Hakeem (1988) or in Amiran *et al.* (1994). Khair *et al.* (2000) also records some epicentral coordinates, but only for two of the three events listed; moreover, no further information on the affected areas is provided, except for the seismogenic zones likely to be involved. The recent study by Guidoboni *et al.* (2004) analyses the complex seismic sequence and classifies the effects of five events, giving their epicentral co-ordinates.

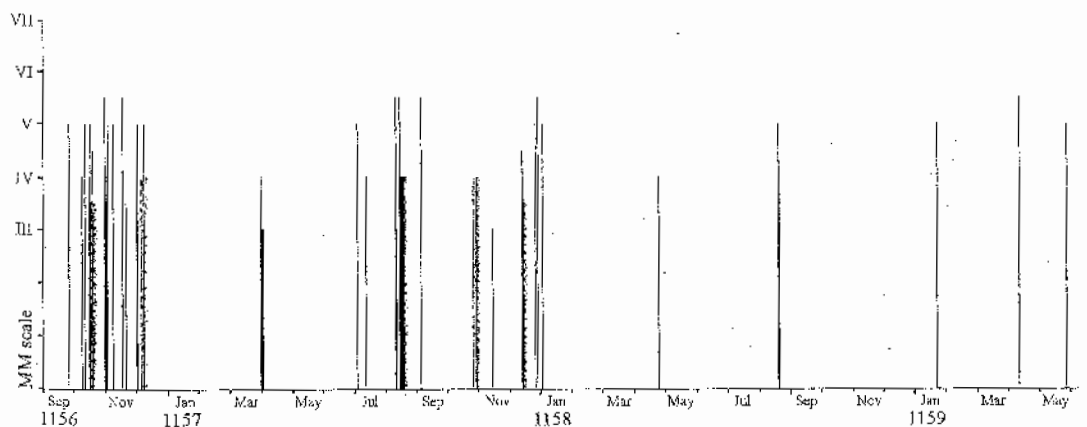


fig. 32 1156-59 sequence: shocks felt at Damascus (from Guidoboni *et al.* 2004).

Effects of the earthquakes

On the basis of information supplied by Ibn al-Qalanisi, who was in Damascus at the time and received news, albeit rather vague, from places in northern Syria, it is possible to identify at least the more important shocks in the sequence between 13 October 1156 and 16 April 1158. The earthquakes in 1156-1159 took place in a particularly difficult period for the Latin and Frankish states: Edessa had fallen in 1144-46, a fact that later constituted the justification for the second Crusade in 1147-1149. From 1151 to 1157 the attack upon Nur al-Din was incessant (and ended in 1160). In the years 1156-1157 there were attempts by the Christian army to reconquer some fortresses, including that of Shayzar, precisely because it had been hit by the earthquake.

1156 October 13 The earthquake of 13 October 1156 struck fear into the inhabitants of Damascus, and vague news reached the city of disasters in many areas of the provinces of Aleppo (Halab) and Hamat (Hamah). Furthermore, one of the towers of Afamiyah had also collapsed (see fig. 33a).

1156 Dec. 9 The earthquake of 9 December 1156 was very strongly felt in Damascus but caused no damage. At Aleppo many houses collapsed, causing many deaths; serious damage also probably affected Shayzar, although Ibn al-Qalanisi does not supply detailed information. The inhabitants of Kafar Tab and Hamat fled panic-stricken from their towns (see fig. 33b).

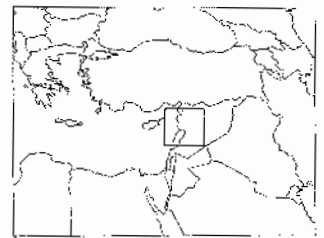
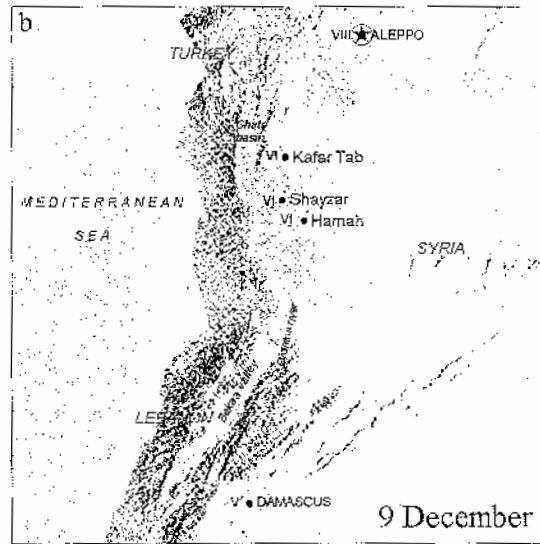
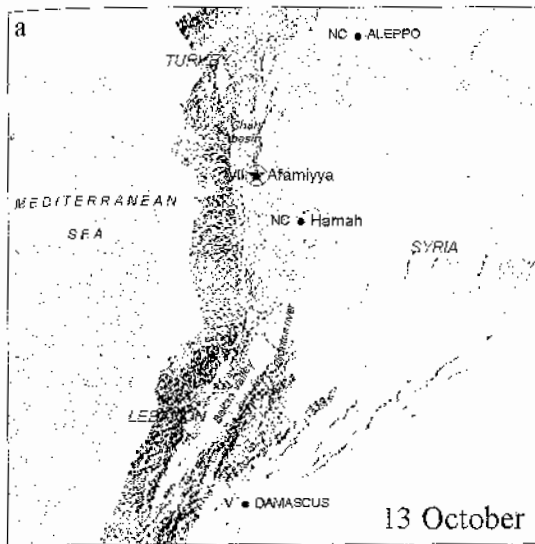
1157 April 2 The earthquake of 2 April 1157 caused a great scare in Damascus. Aleppo, Shayzar, Hamat, Kafar Tab and Afamiyah were probably damaged, although Ibn al-Qalanisi does not record any details of effects (see fig. 33c).

1157 July 5 On 5 July 1157, four shocks were felt in Damascus, the third of which caused outbreaks of panic and confusion among the population. At Hamat, Kafar Tab and Afamiyah there was unspecified damage, but reconstruction work undertaken in previous months was destroyed. There was probably damage at Aleppo as well, and perhaps at Hims (see fig. 33d).

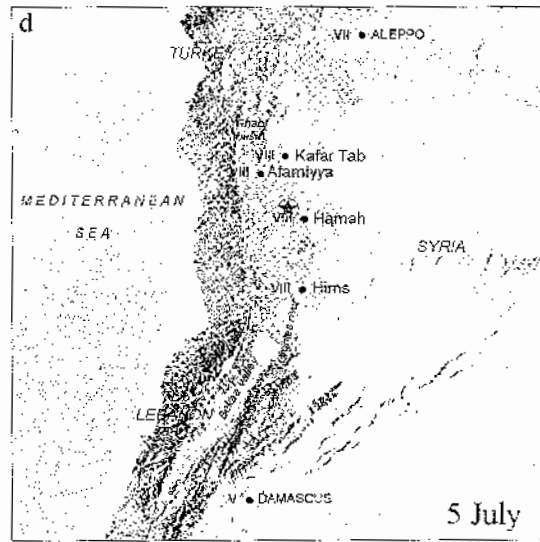
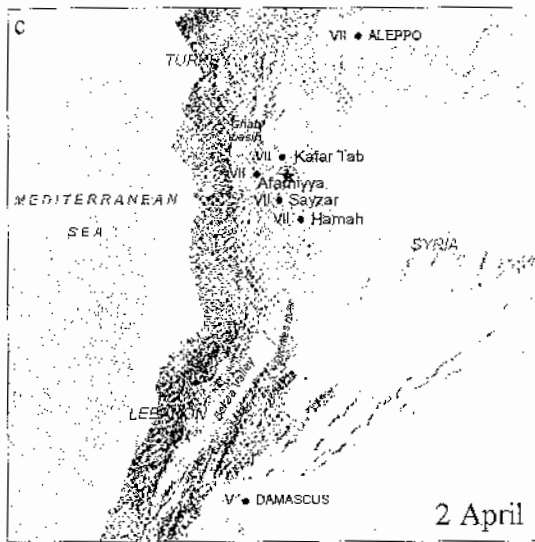
1157 Aug. 9 - Sept. 7 According to Ibn al-Jawzi, the most destructive shocks took place between 9 August and 7 September 1157, that is to say in the month of *Rajab* (552 H.); but he does not give any other chronological details. According to Ibn al-Qalanisi, the strongest shocks at Damascus occurred on 12 and 17 August and on 6 September 1157.

The most serious destruction occurred in the Muslim regions of Aleppo, Hamat and Hims. As regards the coastal territory, controlled by the Christians at the time of this earthquake, we think that reports in Arabic sources are very unreliable. It seems to us that these texts contain an understandable level of exaggeration about areas that were then "hostile", and that news which arrived from them in various oral reports was distorted. Another important factor is the lack of primary sources from the Latins, which can be taken to indicate little or no damage (see fig. 34).

In the following 8 locations in Syrian territory there was heavy damage and destruction, involving the death of all or most of the inhabitants: Hamat, where, amongst other buildings, the Mosque of Hasanyin collapsed, Shayzar (the ancient Latin Larissa), Ba'rin (then also known as Monteferrand), Kafar Tab (Capharda), the fortress of Shumays (near Salamiyah), where there was widespread destruction and many victims, Hims, Maarrat an Numan and Aleppo, where about a hundred people died, and Afamiyah, where the citadel suffered limited collapses (perhaps only one tower?). In the coastal area, damage at the Frankish castles of 'Arqa (called Archis by the Christians, now Mathanat ad Dulbah) and of Hisn al-Akrad (or Crak des Chevaliers, now Qalat al-Hisn) was not serious, in our opinion, although, as we have stated above, the Arabic sources describe them as having been destroyed. This is one of the cases where it can reasonably be argued that the Arabic sources exaggerate the damage: these fortresses had for many years been the site of military clashes, and earthquake damage there could be viewed by one side with understandable satisfaction. Without listing the large number of studies on this fortress, starting at the end of the 19th century with Rey



1156



1157

0 150 km

figg. 33 a, b, c and d (elabored after Guidoboni *et al.* 2004).

(1871), we draw attention to Molin (2001), who reports that after it was acquired by the Order of Hospitallers in 1142 (i.e. about 15 years before this earthquake sequence), it underwent several alterations and repairs. Many of these major alterations (e.g. it was surrounded by an entirely new curtain wall, and many flanking towers were added, Molin, 2001) were undertaken after the large destructive earthquakes of 29 June 1170 and 20 May 1202. However, we cannot rule out the possibility that some repairs and new construction work were carried out even before the 1170 earthquake, simply as a result of the destruction caused by the strong earthquakes of 1156-1157.

There were widespread collapses with many casualties in the coastal towns of Laodicea (now Al-Ladhiqiya), Antioch (Antakya) and Tripoli (now Tarabulus), all three of which were in Christian lands at the time of the 1156-1157 earthquake sequence. Antioch stood on the slopes of a mountain, and was defended by major urban fortifications renowned for their strength; the Byzantine walls were 18 km long and formed a triangle at the apex of which stood the mountain-top citadel, dating back to the 10th century. Some damage is also reported in general terms at the towns of Beirut, Sidon (now Sayda), Tyre (or Sur) and Acre (now Akko), all of which are on the Mediterranean coast, south of Tripoli.

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On 16 April 1158 (15 *Rabi' I* 553 H.), a fresh earthquake further damaged houses at Aleppo and surrounding localities. The seismic sequence continued for over a year, but without causing further damage. The last shocks felt at Damascus are reported to have occurred on 29 May 1159 (9 *Jumada I* 554 H.).

The definition of the damage zone, uncertain in the previous literature, has thus been clarified. The most serious effects extended from the territory of Aleppo (present-day northern Syria) to the southern part of the Edessa region, in present-day south-eastern Turkey. The effects extended southwards as far as Damascus, where they caused no damage, while in Jerusalem the shocks were not felt.

Environmental effects

As a result of the earthquakes which occurred between 9 August and 7 September 1157, Tall Harran, south east of Aleppo, was split in half by the faulting, so revealing the ancient strata of the city; and other surface fractures opened up at Laodicea.

Historical sources

Amongst the Arabic sources are five chronicles and an inscription which supply detailed information about the long and complex seismic sequence of 1156-57. Information in general terms can also be found in one Armenian and one Latin source. In order to follow the sequence of shocks more closely, the texts of the sources have not been divided by location.

Arabic sources

CHRONICLES

The most detailed account is provided by Ibn al-Qalanisi, a historian from Damascus who died in 1160. He was an eye-witness of the long seismic sequence, and in his *Dhayl ta'rikh Dimashq* he devotes many pages to an account of the earthquake, including many details about the effects of individual earthquakes:

"During the night of 9 *Sha'ban* in the year 551 [27 September 1156, corresponding to 27 *Etul*], there was a tremendous earthquake at the second hour, which caused the earth to shake three or four times; then, by the will of Him who had brought it about, the Most High, the Omnipotent, it grew calm again. During the night of Wednesday 22 *Sha'ban* [10 October 1156], there was another earthquake followed by two more of similar intensity during the day and at night. Then there were three more weaker shocks, making a total of six. During the night of Saturday 25 of that month [13 October 1156], another earthquake filled hearts with fear from dawn and then throughout the day, until, by the will of Him who had brought them about, the Most High, the Omnipotent, the earthquakes subsided. News came from Aleppo and Hamat of disasters in many parts [of those provinces], and the destruction of a tower at Afamiyya, caused by these earthquakes sent by God. About 40 shocks were counted, but only God knows the truth of the matter. Certainly, nothing of the like had ever been seen in previous years. On Wednesday 29 *Sha'ban* [17 October 1156], there was another earthquake, after the one already mentioned, at the end of the day, and then yet another during the night. On Monday [from this point on the days of the week do not match the days of the month] 1 *Ramadan* [18 October 1156], there was a terrible earthquake followed by a second and a third. On Tuesday 3 *Ramadan* [20 October 1156], there were three earthquakes, the first of which occurred at the beginning of the day and was dreadful, whereas the second and third were of lesser intensity. There were more shocks in the afternoon, and another dreadful one woke people up in the middle of the night. Glory be to God, who devises such formidable trials. At the ninth hour of the night on Friday 15 *Ramadan* [1 November 1156], there was another terrible earthquake, stronger than the previous ones; in the morning, there was a less powerful shock, followed by a second and a third at the beginning and the end of the Saturday night. On the following Monday, there

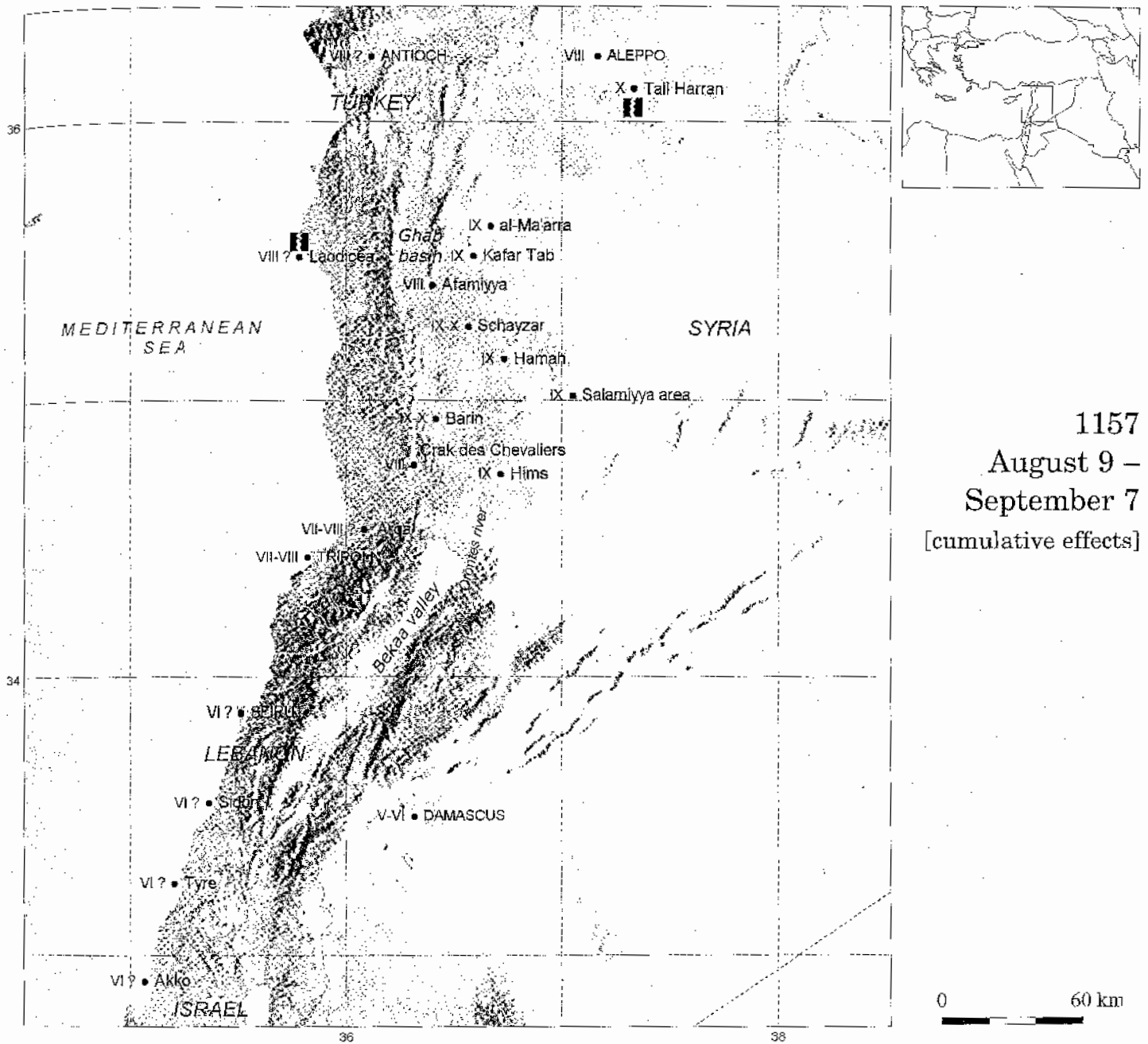


fig. 34 (elaborated after Guidoboni *et al.* 2004).

was another dreadful earthquake. It was followed by another violent earthquake during the first third of the night of Friday 23 *Ramadan* [9 November 1156]. At midday on Sunday 2 *Shawwal* [18 November 1156], an even more violent earthquake than the previous ones spread panic and terror amongst the populace. On Thursday 6 *Shawwal* [22 November 1156], there was a shock at the time of midday prayer. On Monday 16 of the same month [2 December 1156], there was a dreadful shock at the same hour. The following Tuesday there was another similar shock, followed by a second, weaker one, and then by a third and a fourth. During the night of Sunday 23 *Shawwal* [9 December 1156], there was a tremendous earthquake which disturbed men's spirits. Other earthquakes followed — too frequent to number. God spared Damascus and its districts from

1157
August 9 –
September 7
[cumulative effects]

this terror, displaying his mercy to the inhabitants, all praise and thanks be to Him. But news from Aleppo, not to mention Shayzar, spoke of many houses destroyed [at Aleppo], falling in on their inhabitants and so causing many deaths. The inhabitants of Kafar Tab fled from their town in panic. The same thing happened at Hamat; we heard nothing from the other Syrian provinces as to what happened after the earthquake”.

في ليلة الخميس التاسع من شعبان سنة ٥٥١ الموافق لليوم السابع والعشرين من أيلول في الساعة الثانية منها وافت زلزلة عظيمة رجفت بها الأرض ثلاث أو أربع مرات ثم سكنت بقدره من حركتها وسكنها سبحانه وتعالى من ملك قاهر قاهر. ثم وافت بعد ذلك ليلة الأربعاء الثاني والعشرين من شعبان المذكور زلزلة وجاءت قبلها وبعدها مثلها في النهار والليل ثم جاء بعد ذلك ثلاث دونهن بحيث أحصين ست مرات. وفي ليلة السبت الخامس والعشرين من الشهر المذكور جاءت زلزلة ارتاع الناس منها في أول النهار وآخره ثم سكنت بقدره محركها سبحانه وتعالى. وتواصلت الأخبار من ناحية حلب وحماة بانهدام مواضع كثيرة وانهدام برج من أبراج أفامية بهذه الزلازل المباركة وذكر أن الذي أحصى عدد منها تقدير الأربعين على ما حكى والله تعالى أعلم وما عرف مثل ذلك في السنين الماضية. وفي الأربعاء التاسع والعشرين من الشهر بعينه وافت زلزلة تتلو ما تقدم ذكره آخر النهار وجاءت في الليل ثانية في آخره. ثم وافت في يوم الاثنين أول شهر رمضان من السنة زلزلة مروعة للقلوب وعاودت ثانية وثالثة. ثم وافت بعد ذلك في يوم الثلاثاء ثالث ثلاث زلازل احداهن في أوله هائلة والثانية والثالثة دون الأولى وأخرى في وقت الظهر مشاكلة لهن ووافى بعد ذلك أخرى هائلة أيقظت النيام وروعت القلوب انتصاف الليل فسبحان القادر على ذلك. ثم وافت بعد ذلك في الساعة التاسعة من ليلة الجمعة النصف من شهر رمضان من السنة زلزلة عظيمة هائلة أعظم مما سبق. ولما كان عند الصباح من الليلة المذكورة وافت أخرى دونها وتلا ما تقدم في ليلة السبت أولها وجاءت أخرى آخرها. ثم تلا في يوم الاثنين زلزلة هائلة. وتلا ذلك في ليلة الجمعة الثالث والعشرين من شهر رمضان في الثلث الأول منها زلزلة عظيمة مزعجة. وفي غداة يوم الأحد ثاني شوال من السنة تالي ما تقدم ذكره وافت زلزلة أعظم مما تقدم روعت الناس وأزعجتهم. وفي يوم الخميس سادس شوال المذكور وافت زلزلة في وقت صلاة الغداة. وفي يوم الأحد السادس عشر منه وافت زلزلة هائلة في وقت صلاة الغداة. وفي يوم الاثنين تلوها وافت زلزلة أخرى بعدها دونها ثم ثالثة ثم رابعة. وفي ليلة الأحد الثالث والعشرين من شوال وافت زلزلة عظيمة روعت النفوس ثم وافت عقيب ذلك ما أهمل ذكره لكثرتهم ورفع الله تعالى عن دمشق وضواحيها ما خاف أهلها من توالي ذلك وتتابعه يرافته بهم ورحمته لهم فله الحمد والشكر. لكن وردت الأخبار من ناحية حلب بكثرة ذلك فيها وانهدام بعض مساكنها الا شيزر فان الكثير من مساكنها انهدم على سكانها بحيث قتل منهم العدد الكثير. وأما كفر طاب فهرب أهلها منها خوفا على أرواحهم. وأما حماة فكانت كذلك وأما باقي الأعمال الشامية فما عرف ما حدث فيها من هذه القدرة الباهرة.

Ibn al-Qalanisi (*Dhayl ta'rikh Dimashq*, 338, 342-344, 346, 348-349) goes on as follows: “During the night of Wednesday 19 *Safar* in the year 552 [H. = 2 April 1157], towards dawn, there was a tremendous earthquake which caused great terror; but He who had brought it about then allayed it through His goodness and mercy towards His servants. There was another, weaker shock during the night of the following Thursday, and another the next day, at the time of midday prayer. News came from the north about the effects of these earthquakes; first of all came news from the towns of Shayzar, Hamat, Kafar Tab and Afamiyya and their districts, and then from the area around Aleppo. [...] and God the Most High, the Holy, the Merciful, knows more. On Thursday 25 *Jumada I* [5 July 1157], after the third hour, the earth shook; six hours later it shook again, and eight hours after that there was a third shock. It was stronger than the other two and struck panic into the populace. But He who summoned the earthquakes brought them to an end, thanks to his power. At the close of the day, towards dusk, there was a fourth shock; the people were panic stricken and confused, and began praying and imploring God. During the night of Sunday 4 *Jumada II* [14 July 1157], a shock occurred, followed by another of lesser intensity. [...] News from the north told of worsening earthquakes at Aleppo; the people of the city were terrified, as were those of Hims. Destruction

occurred in many part of Hamat, Kafar Tab and Afamiyya, and what had been rebuilt after previous earthquakes collapsed again. It appears that at Tayma', too, houses suffered dreadful damage. At the ninth hour on 4 *Rajab* in that year [12 August 1157], there was a dreadful earthquake at Damascus, such as had never been seen before; the shocks lasted so long that people fled in terror from their houses and shops and other covered places. In the confusion, numerous priceless objects were lost in the mosque [the Great Umayyad Mosque]. Immediately afterwards, there was another shock, which the will of God immediately brought to an end; hearts grew calm again and fear ceased. There were more shocks during the evening of that day, in the middle of the night and towards dawn, the last one being weaker than the others. [...] On Friday 8 *Rajab* [16 August 1157], a dreadful shock spread panic again; it was followed by another shock in the middle of the night and a third at dawn. The same thing happened during the night of Saturday, Sunday and Monday, and on other days as well. When the earthquake struck Damascus [during the night of Monday 29 *Rajab* (6 September 1157)] people were terrified. [The date is missing from Ibn al-Qalanisi's text, but can be found in Abu Shama, *al-Rawdatayn*, I, 105, where the same news is reported], the inhabitants were panic stricken and fled from their homes and other covered places towards the Great Mosque and open spaces, fearing for their lives. After that first shock there was another: the gates of the city were opened and people poured out into the countryside, the fields outside the walls and the desert, thus spending some days in anguish and fear, begging God to save them. On Wednesday 24 *Ramadan* [30 October 1157], another earthquake at Damascus struck terror into the populace, who had already suffered from the preceding earthquakes affecting the whole of the Syrian territories. The earthquake caused further destruction. News came from Aleppo of a dreadful earthquake which had damaged dwellings and the city walls: the townspeople fled into the countryside in search of safety. The earthquakes which struck Hamat were stronger than elsewhere: what had been rebuilt was destroyed again, and the shocks lasted for many days, accompanied by rumblings similar to deafening thunder. The populace threw themselves on the mercy of God. Subsequent shocks were weaker. During the night of Saturday 10 *Shawwal* [15 November 1157], after evening prayer, there was a dreadful earthquake which threw hearts into dismay, and it was followed by a weaker shock, which was immediately suppressed by the will of God. [...] During the night of Saturday 10 *Dhu'l-qa'da* [14 December 1157], a first powerful shock was followed by other weaker ones. On that same day [i.e. Sunday], at about the second hour, there was a shock followed by another; then the earthquake stopped by the will of God. During the night of Friday 23 *Dhu'l-qa'da* [27 December 1157], at the first hour, an earthquake threw hearts into confusion and caused houses and dwellings to shake; then it died down, thanks to God. [...] Two days later, at the beginning of the night of Sunday 25 [29 December 1157], there was a first shock which caused terror and confusion, then a second about midnight — a stronger one, which caused people to pour into the mosque and open spaces, imploring the help of God. [...] Then there were two more weaker shocks towards dawn, and then a third, a fourth, a fifth and a sixth. Finally the earthquake ceased by the will of God. [...] On Friday, the last day of *Dhu'l-qa'da* [3 January 1158], at about the second hour, the earth shook, striking terror into the population; then it died down, in accordance with the will and judgment of Him who had summoned it, praise to be Him for His mercy towards His servants, glory to God, Lord of the universe".

ولما كانت ليلة التاسع عشر من صفر سنة ٥٥٢ هـ وافت زلزلة عظيمة عند انبلاج الصباح فروعت وأزعجت ثم سكنها محرکہا بلطفه ورأفته بعباده ثم تلا ذلك أخرى دونها، إلى ليلة الخميس تاليه بعد مضي ساعات منها ووافت بعدها أخرى بعد صلاة الجمعة تاليه. وتواصلت الأخبار من ناحية الشمال بعظم تأثير هذه الزلازل الأولى منها والآخر في مدينة شيزر وحماة وكفر طاب وأقامية وما ولاها إلى مواضع من حلب والله تعالى ذكره وعز اسمه أعلم وأرحم لخلقه. وفي يوم الخميس الخامس والعشرين من جمادى الأولى وافت زلزلة عظيمة بعد مضي ثلاث ساعات منه اهتزت لها الأرض هزات ثم وافت بعدها ثانية

فرت بعد مضي ست ساعات من اليوم ثم بعد مضي ثماني ساعات من هذا اليوم المذكور وافت ثالثة أشد من الأوليين وأزعج فسبحان مقدرته ومسكنهن بحكمته تعالى علوا كبيرا وفي آخر هذا زلزلة رابعة لا تقدم بين العشائين من ليلة مروعة هائلة أزعجت وأقلقت وضح الناس بالتهليل والتسبيح والتقديس. وفي ليلة الأحد الرابع من جمادى الآخرة من السنة آخرها عند صلاة الغداة وافت زلزلة هائلة وجاء بعدها أخرى دونها. وتواصلت الأخبار من ناحية الشمال بأن هذه الزلازل أثرت في حلب تأثيرا أزعج أهلها وأقلقهم وكذلك في حمص وهدمت مواضع فيها وفي حماة وكفر طاب وأفامية وهدمت فيها ما كان من هدم ما بني من المهديم بالزلازل الأولى. وحكى عن تيماء أن هذه الزلازل أثرت في مساكن تأثيرا مهولا. وفي الساعة التاسعة من يوم الاثنين الرابع من رجب سنة ٥٢ وافت زلزلة عظيمة في دمشق لم ير مثلها فيما تقدم ودامت رجفاتها حتى خاف الناس على أنفسهم ومنازلهم وهربوا من الدور والحوانيت والسقائف وانزعجوا وأثرت في مواضع كثيرة ودمت من فص الجامع الشيء الكثير الذي يعجز عن إعادة مثله ثم وافت عقيبها زلزلة في الحال ثم سكنتا بقدرته من حركتهما وسكنت نفوس الناس من الروعة والخوف برحمة خالقهم ورازقهم لا اله الا هو الرؤوف الرحيم ثم تبع ذلك في ليلة اليوم المذكور وفي وسط زلزلة وفي آخره زلزلة أخف من الأولى والله تبارك وتعالى لطيف بعباده وبلاؤه وله الحمد والشكر رب العالمين. وتلاها في يوم الجمعة الثامن من رجب زلزلة مهولة أزعجت الناس وتلاها في النصف منها ثانية وعند أنبلاج الصبح الثالثة. وكذلك في ليلة السبت وليلة الأحد وليلة الاثنين وتتابع بعد ذلك بما يطول به الشرح. وأما أهل دمشق فلما وافتهم الزلزلة في ليلة الاثنين التاسع والعشرين من رجب ارتاح الناس من هولها. وأجفلوا من منازلهم والسقف إلى الجامع والاماكن الخالية من البنين خوفا على نفوسهم ووافت بعد ذلك أخرى وفتح باب البلد وخرج الناس إلى ظاهرها والبساتين والصحراء وأقاموا عدة ليال وأيام من الخوف والجزع يسبحون ويهللون ويرغبون إلى خالقهم ورازقهم في العفو عنهم والल्पف بهم والله تعالى وإلى الاجابة وقبول الرغبة والابانة. وفي يوم الاربعاء الرابع والعشرين من شهر رمضان من السنة وافت في دمشق زلزلة روعت الناس وأزعجتهم لما قد وقع في نفوسهم مما قد جرى على بلاد الشام من تتابع الزلازل فيها وهدم ما هدمت منها. ووافت الأخبار من ناحية حلب بأن هذه الزلزلة المذكورة جاءت في حلب هائلة قلقلت من دورها والجدران العدد الكثير وأجفل منها أهلها إلى ظاهرها خوفا على نفوسهم. وأنها كانت بحماسة أعظم ما كانت في غيرها وأنها هدمت ما كان عمر فيها من بيوت كان ملتجأ إليها وأنها دامت فيها أياما كثيرة في كل يوم عدة وافرة من الرجفات الهائلة وتتبعها صيحات مختلفة توثي على أصوات الرعود القاصفة المزعجة فسبحان من له الحكم والأمر ومنه تؤمل الرحمة والल्पف وهو على كل شيء قدير. وتلا بعد ذلك رجفات متوالية أخف من غيرهن فلما كان في ليلة السبت العاشر من شوال وافت زلزلة هائلة بعد صلاة العشاء الآخرة وأزعجت وأقلقت وتلاها في أثرها هزة خفيفة سكنها محركها بقدرته ورافته بأهل دمشق ورحمة فله الحمد والشكر رب العالمين. وفي ليلة السبت العاشر من ذي القعدة من السنة وافت أولها زلزلة رجفت لها الأرض ووجلت لها القلوب وتبعها عدة أخف من الأولى. وفي غد هذا اليوم بعد مضي تقدير ساعتين منه وافت زلزلة وأخرى في أثرها وسكنهن المحرك لهن بقدرته وحكمته وسلم منهن برحمته وبرافته سبحانه وتعالى الرؤوف الرحيم. وفي ليلة الجمعة الثالث والعشرين من ذي القعدة التالي لما تقدم بعد مضي ساعة منها وافت زلزلة روعت القلوب وهزت المنازل والمساكن ثم سكنها محركها بقدرته القاهرة ورحمته الواسعة فله الحمد والشكر رب العالمين. وفي ليلة الأحد الخامس والعشرين من الشهر المذكور التالي يوم الجمعة المقدم ذكره وافت زلزلة أزعجت وأقلقت ثم تلاها ثانية عند انتصافها أعظم منها ففر الناس من هولها إلى الجامع والاماكن المنكشفة وضجوا بالتكبير والتهليل والتسبيح والدعاء إلى الله تعالى والتضرع إليه ثم وافى بعد تلك ثانية وثالثة دونها عند تصرم الليل ثم وافى بعد الثالثة رابعة دونها ثم خامسة وسادسة ثم سكنت بقدرته محركها ولم تؤثر أثرا منكرا فله الحمد تعالى أمره وعظم شأنه. وفي يوم الجمعة انسلاخ ذي القعدة من السنة بعد مضي تقدير ساعتين منه وافت زلزلة رجفت بها الأرض وانزعج الناس لها ثم سكنت بقدرته المحرك لها وحكمته البالغة فله الحمد على لطفه بعباده تبارك الله رب العالمين.

Ibn al-Qalanisi, *Dhayl ta'rikh Dimashq*, 352 [Abu Shama, *al-Rawdatayn*, I, 102] goes on: "It was learned that on 15 Rabi' I [16 April 1158] in that year [553 H.], there was a dreadful earthquake in the region of Aleppo, which threw the population into a state of panic and damaged many dwellings. During the night of Saturday 25 Rabi' I [26 April

1158], the earth shook at Damascus; then it calmed down by the will of God. During the night of 23 *Rajab* [20 August 1158], at the hour of midday prayer, hearts were struck with fear by an earthquake shock which immediately died down by the grace of God. Another shock occurred during the night of the following Thursday, accompanied by a second at midday”.

ورد الخبر في الخامس عشر من شهر ربيع الأول من السنة من ناحية حلب بحدوث زلزلة هائلة روعت أهلها وأزعجتهم وزعزعت مواضع من مساكنها ثم سكنت بقدره محركها سبحانه وتعالى ذكره. وفي ليلة السبت الخامس والعشرين من ربيع الأول من السنة وافت زلزلة بدمشق روعت وأقلقت ثم سكنت بقدره محركها تعالى ذكره. وفي آخر ليلة الأربعاء الثالث والعشرين من رجب من السنة وافت زلزلة عند تأذين الغداة روعت القلوب وأزعجت النفوس ثم سكنت بقدره الله الرؤوف الرحيم. ثم وافت أخرى عقيب الماضية في ليلة الخميس وقت صلاة الغداة ثم سكنت بقدره الله تعالى.

Ibn al-Qalanisi, *Dhayl ta'rikh Dimashq*, 354, 357 finishes his account as follows:

“On the first Friday in *Muharram* [23 January 1159] that year [554 H.], there was a strong earthquake at dawn, followed by two weaker shocks. [...] In the middle of the night of Sunday 22 *Rabi' I* [13 April 1159], the earth shook violently four times as though it were swaying, waking those who were sleeping and frightening those who were awake. Then everything returned to a state of calm by the will of God. [...] On Friday 9 *Jumada I* [29 May 1159], a very strong wind arose and blew throughout the day and night, destroying crops and plantations. That night there were two earthquake shocks like waves which spread panic, until God put an end to the earthquake”.

أولها يوم الجمعة مستهل المحرم منها. وفي هذا اليوم وافت زلزلة عظيمة ضحى نهارها وسكنت محركها بقدرته ورحمته وتلاها اثنتان دونها. وفي ليلة الأحد ٢٢ شهر ربيع الأول وافت في انتصافه زلزلة هائلة ماجت أربع موجات أيقظت النيام وأزعجت اليقظى وخاف كل ذي مسكن مضطرب على نفسه وعلى مسكنه ثم سكنه محركها بلطفه ورحمته. وفي يوم الجمعة التاسع من جمادى الأولى هبت ربيع شديدة أقامت يومها وليلتها فأتلقت أكثر الثمار صيفيها وشتويها وأفسدت بعض الشجار ثم وافت آخر الليل زلزلة هائلة ماجت موجتين أزعجت وأقلقت وسكنت محركها وحرس المساكن مثبتتها برحمته وقدرته فله الحمد والشكر رب العالمين.

Ibn al-Jawzi (1116-1200), a contemporary Arab historian from Baghdad, is well informed, but provides a briefer exposition of the facts (*al-Muntazam*, X, 176):

“In the month of *Ramadan*, news arrived that a series of earthquakes had struck the Syrian territories in the month of *Rajab* [August – September 1157], and had destroyed thirteen towns, eight in Muslim territory and five in that of the pagans [the Franks]. The Muslim towns were Aleppo, Hamat, Shayzar, Kafar Tab, Afamiyya, Hims, Al-Ma'arra [Maarrat an Numan] and Tall Harran; the Frankish towns were the fortress of Akrad [Hisn al-Akrad], 'Arqa, Laodicea, Tripoli and Antioch [Ibn al-'Adim, *Zubdat al-Halab*, II, 306, adds the fortress of Shumays, near Salamiyah]. There were a hundred victims at Aleppo; Hamat was almost completely destroyed; at Shayzar only one woman and her servant survived; at Kafar Tab there were no survivors; the citadel of Afamiyya collapsed; at Hims there were many victims; Al-Ma'arra was partly destroyed; Tall Harran split into two, and tombs and houses [i.e. the stratum of the ancient town] came to the surface. Akrad and 'Arqa were completely destroyed; at Laodicea there were many victims, and a statue appeared in a fissure, which subsequently filled with water; most of the inhabitants of Tripoli were killed; and few people survived at Antioch”.

وصل الخبر في رمضان بزلازل كانت بالشام عظيمة في رجب تهدمت منها ثلاثة عشر بلد ثمانية من بلاد الاسلام وخمسة من بلاد الكفر أما بلاد الاسلام فحلب وحماة وشيزر وكفر طاب وأفامية وحمص والمعرة وتل حران وأما بلاد الافرنج فحصن الاكراد وعرقه واللاذقية وطرابلس وأنطاكية. فأما حلب فأهلك منها مائة نفس وأما حماة فهلكت جميعا الا اليسير وأما شيزر فما سلم منها الا امرأة وخدام لها وهلك جميع من فيها وأما كفر طاب فما سلم منها أحد وأما أفامية فهلكت وساخت قلعتها وأما حمص فهلك منها عالم

عظيم وأما المعرة فهلك بعضها وأما تل حران فانه انقسم نصفين وظهر وسطه نواويس وبيوت كثيرة وأما حصن الأكراد وعرة فهلكتا جميعا وهلكت اللاذقية فسلم منها نفر ونبع فيها جومة فيها حماة وفي وسطها صنم واقف وأما طرابلس فهلكت أكثرها وأما أنطاكية فسلم بعضها.

Ibn al-Athir, an Arab historian born in 1160, provides a report which is brief, but particularly useful for the additional piece of information that Ba'rin was destroyed (*al-Ta'rikh*, p.110):

"At Laodicea, a place split into two parts, out of which a statue appeared in the midst of the water. The cities of Sidon, Beirut, Tripoli, Acre, Tyre and all the citadels of the Franks were damaged". "There was a very violent earthquake in the Syrian territories, with a succession of tremendous shocks spreading destruction across the country and causing people to die. The strongest earthquakes were at Hamat and the citadel of Shayzar: both were destroyed. The same thing happened at the fortress of Ba'rin, at Al-Ma'arra [Maarrat an Numan] and at other villages. Many people perished in the ruins; town walls, houses and fortresses collapsed. Thanks be to God, Nur al-Din intervened, for he assembled an army and guaranteed the protection of the whole province conquering it without fighting or siege". "In connection with the pious sovereign Nur al-Din, we have already recalled — in bringing to a close our information about him — how he reorganised his troops and led them from Damascus towards Mesopotamia, which the Frankish coalition was anxious to conquer and govern. At that time, there were earthquakes with continual shocks which caused the destruction of fortresses, citadels and dwellings throughout the territory, from which all those of the inhabitants of Hims, Shayzar, Kafar Tab, Hamat and other areas who managed to escape, took to flight [...] towards the coastal and border regions. A great many people gathered into groups there".

انشق في اللاذقية موضع ظهر فيه صنم قائم في الماء وخربت صيدا وبيروت وطرابلس وعكا وصور وجميع قلاع الأفرنج.

كانت بالشام زلزلة شديدة ذات رجفات عظيمة متتابعة أخرجت البلاد وأهلكت العباد وكانت أشدها بحماة وحصن شيزر فانهما خربتا بالمرّة وكذلك ما جاورهما كحصن بارين والمعرة وغيرها من البلاد والقرايا وهلك تحت الهدم وتهدمت الأسوار والدور والقلاع ولولا أن الله من على المسلمين بنور الدين جمع العساكر وحفظ البلاد والا كان دخلها بغير قتال وحصار.

قد تقدم من ذكر الملك العادل نور الدين في نهوضه من دمشق في عساكره الى بلاد الشام عند انتهاء الخبر اليه بتجمع أخزاب الأفرنج خذلهم الله وقصدهم لها وطمعهم فيما يحكم ما حدث من الزلازل والرجفات المتتابعة بها وما هدمت من الحصون القلاع والنازل في أعمالها وثغورها لحمايتها والذب عنها وايناس من سلم من أهل حمص وشيزر وكفر طاب وحماة وغيرها بحث اجتمع اليه الخلق الكثير والجم الغفير من رجال المعازل والأعمال والتركان وخيم بهم بازاء جمع الأفرنج في الأعداد الوفرة والتناهي في الكثرة بالقرب من أنطاكية وحصروهم بحيث لم يقدر فارس على الاقدام على الفساد.

INSCRIPTION

■ Hamah: inscription of 1157 (RCEA, IX, no.3220, pp.13-14 and Ciccarello, 1996, pp.489-90); recalls the reconstruction of the mosque of Hasanayin, built by Nur ad-Din (1118-1174), Muslim prince of Syria at the times of the Crusades.

"[In the name of God the Merciful, the Compassionate]. There is no god but God, [and Muhammad is his] Prophct. God [bless] him and grant him peace, and his family as well. The rebuilding of this blessed mosque, after its collapse in the earthquake which occurred in the year 552, was ordered by our lord, the righteous sovereign and devout warrior, Nur ad-Din Abu 'l-Qasim Mahmud b. Zanki, b. [Iq Sunqur]..."

بسملة لا إله إلا الله \ لمحمد راسول [الله صلى] الله عليه و آله \ و سلم أمر بعمارة هذا المسجد المبارك بعد \ هدمه في الزلزلة الحادثة سنة اثنتين و خمسين \ و خمس مائة مولانا الملك العادل المجاهد \ نور الدين أبو القاسم محمود بن زنكي بن \ آق سنقر ...

Armenian sources

Some mention of the earthquakes of 1156 is contained in the *Chronicle* of Gregory the Priest: he was a disciple of Matthew of Edessa, a 12th century Armenian historian, and was the one who continued with his *Chronicle* (from 1132 to 1162). The original text was passed on in three manuscripts of the convent of S.Lazaro degli Armeni, of Venice.

Latin sources

As regards the Latin sources, although the analysis has been systematic, only a brief mention has emerged from the chronicles of Robert of Torigny. He was a monk in the Benedictine abbey of Bec (in Brittany, France), where his presence is recorded from 1128 to 1154. From 1155 Robert became the abbot of the great abbey of Mont-St-Michel where he remained until his death in 1187. The news of the earthquakes in Syria probably reached France in a somewhat confused state because the damage mostly concerned the Muslim area of Syria, which was thus less accessible to the Christians. The text does not contain precise references to the places hit, simply defined as "lands overseas"; the date is generically stated as 1157.

▲							
1156 10 13	★ = 35 25	36 24	Io = VI	Me = 4.9	Sites: 4		
localities	lat.	long.	I	localities	lat.	long.	I
Afamiyah	35 25	36 24	VII	Aleppo	36 14	37 10	NC
Damascus	33 30	36 19	V	Hamah	35 09	36 44	NC
1156 12 09	★ = 36 14	37 10	Io = VII	Me = 5.3	Sites: 5		
localities	lat.	long.	I	localities	lat.	long.	I
Aleppo	36 14	37 10	VIII	Shayzar	35 16	36 34	VI
Hamah	35 09	36 44	VI	Damascus	33 30	36 19	V
Kafar Tab	35 31	36 35	VI				
1157 04 02	★ = 35 24	36 38	Io = VII	Me = 5.8	Sites: 6		
localities	lat.	long.	I	localities	lat.	long.	I
Afamiyah	35 25	36 24	VII	Kafar Tab	35 31	36 35	VII
Aleppo	36 14	37 10	VII	Shayzar	35 16	36 34	VII
Hamah	35 09	36 44	VII	Damascus	33 30	36 19	V
1157 07 05	★ = 35 12	36 37	Io = VIII	Me = 6.8	Sites: 6		
localities	lat.	long.	I	localities	lat.	long.	I
Afamiyah	35 25	36 24	VIII	Hims	34 44	36 43	VIII
Kafar Tab	35 31	36 35	VIII	Aleppo	36 14	37 10	VII
Hamah	35 09	36 44	VIII	Damascus	33 30	36 19	V
1157 08 09 - 09 07	cumulative effects		Sites: 20	EE: 2			
localities	lat.	long.	I	localities	lat.	long.	I
Tall Hairan SYR	36 07	37 20	X EE	Antioch TR	36 14	36 07	VIII?
Ba'rin SYR	34 56	36 25	IX-X	Qalat al-Hisn SYR	34 46	36 19	VIII
Shayzar SYR	35 16	36 34	IX-X	Al-Ladhiqiya SYR	35 31	35 47	VIII? EE
Hamah SYR	35 09	36 44	IX	Mathanat ad Dulb. RL	34 32	36 05	VII-VIII?
Kafar Tab SYR	35 31	36 35	IX	Tripoli RL	34 26	35 51	VII-VIII?
Hims SYR	34 44	36 43	IX	Akko IL	32 55	35 04	VI?
Maarrat an Num. SYR	35 38	36 40	IX	Beirut RL	33 52	35 31	VI?
Salamiyah area SYR	35 01	37 03	IX	Sayda RL	33 33	35 22	VI?
Afamiyah SYR	35 25	36 24	VIII	Tyre RL	33 16	35 11	VI?
Aleppo SYR	36 14	37 10	VIII	Damascus SYR	33 30	36 19	V-VI

< 081 > 1160 October 15 Southern Latium [central Italy]

< 082 > 1161 January 16 Southern Latium

- sources *Ann. Ceccan.*, p.285; *Chron. Sublac.*, pp.28-9
- historiography Moroni (1856); Mirzio (ed.1885)
- literature Molin (1995); Di Giovambattista and Tertulliani (1996); Fiore Cavaliere and Mari (1996); Di Giovambattista *et al.* (1997); Molin *et al.* (2000); Molin *et al.* (2002)
- catalogues d. Bonito (1691); Perrey (1848); Mallet (1853); Mercalli (1883); Baratta (1901); Galli (1906); Capocci 1961-63
- catalogues p. Giorgetti and Iaccarino (1971); Carrozzo *et al.* (1973); Dell'Olio and Molin [1980]; Postpischl (1985, fiches)

History of the earthquakes' interpretation

These two earthquakes have been known to seismological literature since Bonito (1691, p.484), but have been "lost" from current catalogues. Although Bonito refers to the primary source, he postdates the earthquakes by one year, listing them at 1161 and 1162. Perrey (1848, p.121) and Mercalli (1883, p.222) record both earthquakes and date them correctly to 1160 and 1161. So does Baratta (1901, pp.26-27), and he places them at Ceccano (in the province of Frosinone, southern Latium) or nearby Veroli, where he maintains the pope was to be found at the time; but that suggestion is based on a misinterpretation of a passage in his source, the *Chronicon Fossaenova* (the pope was in fact at Anagni, not far away). All these catalogues take their information from a contemporary source: the chronicle thought to have been compiled at the abbey of Fossanova and published as the *Chronicon Fossaenova* by Muratori in the *Rerum Italicarum Scriptores* (vol. VII, 1725, col.872). These two earthquakes were given an epicentral intensity of grade VII MCS by Giorgetti and Iaccarino (1971) as well as by Carrozzo *et al.* (1973); in Postpischl (1985, fiches) the two events are listed without an intensity estimate. Neither earthquake appears in later seismic catalogues, however. They do not appear in CFTI (Boschi *et al.* 1995, 1997, 2000) because their intensity is below the threshold for events in that catalogue, nor in other catalogues with a lower intensity threshold (Camassi and Stucchi 1997; CPTI 1999). There is reliable evidence for these two strong earthquakes, however, and the seismological tradition places them at Ceccano; but in our view they are to be related to an earthquake at Subiaco during the reign of pope Alexander III (1159-1181). The Subiaco event has also been omitted from current catalogues as a result of inadequate analyses (see below), and has had doubt cast on it in the literature (Molin 1995; Molin *et al.* 2000). In order to clarify our state of knowledge about it, we have had to reexamine other related 13th century events which have been thought doubtful but are in fact false. In our search for confirmation of our hypothesis, we consulted published papal chancery documents concerning southern Latium, but without result. To sum up: we interpret the effects of two events which have until now been thought separate as due to a single earthquake — probably the one which occurred on 15 October 1160 and for which the epicentral area cannot be identified in our current state of knowledge.

A new hypothesis

On 15 October 1160, an earthquake struck the Ceccano area; and another occurred on 16 January in the following year, at about 06:00 UT (at dawn). There is evidence for these two earthquakes in a contemporary chronicle of the town of Ceccano, which was thought to have been compiled at the ancient abbey of Fossanova, but according to Pertz, who republished it in 1866 with the title *Annales Ceccanenses*, it was compiled at Ceccano (see the entry below for the 1170 earthquake). Little is recorded about the two earthquakes (p.285), but there is no doubt that they occurred: in both cases we are given not only a date but also descriptive adjectives as to their "size", one being described as "great" (*magnus*) and the other as "huge" (*ingens*). No effects are specified, however:

"1160 [...] On the day of the Ides of October [15 October] there was a great earthquake. [...] 1161 in the 9th indiction. In this year, seventeen days before the Calends of February [16 January] there was a great earthquake at dawn".

1160 [...] *Idibus Octobris fuit terrae motus magnus.* [...]

1161 indictione 9. *Hoc anno 17. Kalendas Februarii in aurora fuit ingens terrae motus.*

On the basis of this single source, seismological literature has located the two earthquakes as follows: Giorgetti and Iaccarino (1971) and Postpischl (1985, fiches) give Veroli, thereby taking up the tradition deriving from Baratta (1901, pp.26-7) where the first earthquake is wrongly dated to 14 January; Dell'Olio and Molin [1980] give the Frosinone area, without an intensity estimate. In our opinion both these earthquakes are to be related to one which, as explained above, took place during the reign of pope Alexander III (1159-1181) but has been "lost" in current catalogues. This Subiaco earthquake caused the almost total collapse of the ancient church of Ss.Cosma e Damiano and the attached monastery of S.Clemente — the first monastery to be founded by St.Benedict at the beginning of the 6th century, and dedicated to St.Clement. When the monastery was first built, it made use of the ancient Roman villa of the emperor Nero (54-68 AD), which dated to the early years of his reign. The Benedictines subsequently moved to the nearby monastery of S.Scolastica, which was begun in the 11th century (for the position of these buildings, see the map on p.435). The earthquake which caused the collapse of the church of Ss.Cosma e Damiano is recorded without a specific date in the *Chronicon Sublacense* — a 14th century text which relates the history of the Benedictine monastery at Subiaco. It was written by various hands at various times, and the relevant text is set out below. The words in square brackets are provided by Morghen (1927, pp.28-9), who edited the work:

"We have found a document dating to the time of pope Alexander, in which the above-mentioned church [Ss.Cosma e Damiano, attached to the monastery of S.Clemente] is reported as having been completely destroyed by an earthquake which devastated whole areas of the world, including large and strong buildings. But Abbot Lando, who had the cloister of this Subiaco monastery [S.Scolastica] almost completely rebuilt, had all the recoverable columns and marble slabs removed from the ruins of that same church [Ss.Cosma e Damiano]. But the damage was so serious that a large part of the building of the said monastery [S.Clemente] collapsed, and many of the things that were lost will not be recovered by anyone now living, and perhaps never [...] they found the marble [...] in my time and the columns [...] experience. In the year of Our Lord 1165, during the reign of pope Alexander III, Abbot Oddo removed all the church decoration and ended his life in wretchedness".

A[lexandri pape tempore scriptum] reperimus quod terremotu subvertente per mundo climata quam plurima magna et forcia edificia, supradictam ecclesiam de qua superius [mentionem] fecimus, vastata in toto fuit. Abbas autem Landus qui claustrum huius cenobii sublacensis quasi de novo construxit ex ruina ipsius ecclesiae fecit columpnas et tabulas marmoreas [auferr]i quas ex dicta ruina colligere potuit. Ex magnitudine autem ruine maxima pars edificii [dicti monasterii] corruit tantaque usque nunc et forsitan usque in eternum que perdita fuerunt, per nullum viventem recuperabuntur [...] repererunt marmoreas [...] tempore meo et columpnas [...] experienciam. Anno domini MCLXV Oddo abbas tempore Alexandri pape tercii ille omnia ornamenta ecclesie abstraxit et miserabiliter vitam consumpsit.

The above passage from the *Chronicon Sublacense* contains several chronological references, and there are also some gaps in the text: perhaps that is the reason why various incorrect interpretations are to be found in historiography and seismological literature. Thus the dates 1216, 1227 and 1228 have been attributed to the earthquake referred to, leading to doubts as to whether it really occurred (Molin 1995; Molin *et al.* 2000). However, an analysis of the text and the ways it has been interpreted allow us to amend the dates given above, and to attribute the damage at Subiaco to the same earthquake which was strongly felt at Ceccano. The earliest text of the *Chronicon Sublacense* is in Codex

Vaticanus Rossianus 385. It was first published in 1738 by Muratori (*Rerum Italicarum Scriptores*, vol.24), and in 1927 Morghen published a more thorough edition. The above passage from the chronicle is difficult to interpret because of gaps in the codex text. In particular, the report of the earthquake is preceded by a capital "A" followed by a blank space. We agree with Di Giovambattista and Tertulliani (1996) and Di Giovambattista *et al.* (1997) in concluding that the period within which the earthquake occurred can be identified thanks to Morghen's suggested reading: "[A]lexandri pape tempore scriptum]", which is echoed and confirmed by the later words "tempore Alexandri pape tercii ille", where the pronoun *ille* indicates that pope Alexander III has already been referred to — in the blank space, that is to say. There is then a reference to Abbot Lando (he took office in 1219 or 1227) having had any reusable materials (pieces of marble and columns) taken away from the ruins of the church for use in building the cloister of the monastery of S.Scolastica. Then, after more gaps, 1165 is specifically mentioned as the year when Abbot Oddo removed decorations from the church. In this connection, it has to be pointed out that there was no abbot of S.Scolastica called Oddo at that time. Morghen (1927) suggests that the man in question was Octavian, son of Otto de Polo, who captured the monastery at that period and removed much of its wealth. We can therefore conclude with reasonable confidence that the destructive Subiaco earthquake occurred between 1159 and 1181 (i.e. during the reign of pope Alexander III) or, more likely, between 1159 and 1165. Di Giovambattista and Tertulliani (1996) and Di Giovambattista *et al.* (1997) do not thoroughly investigate the relationship between this dating and that found in the *Annales Ceccanenses*, which, as we have seen, give specific years for the two close earthquakes, namely 1160 and 1161. We think it unlikely, on the other hand, that the Subiaco earthquake is to be related to that recorded in the *Annales Ceccanenses* for the year 1170 (see the entry concerned), precisely because the earthquake responsible for the damage at Subiaco is most likely to have occurred in the period 1159-1165. Molin (1995) and Molin *et al.* (2000), however, cast doubt on the Subiaco earthquake. Although Molin *et al.* (2002) consider it unlikely that the earthquake actually occurred, they think it should be dated in any case to the early decades of the 13th century — that is to say when the monastery was headed by Abbot Lando. Their view, which we do not accept, is that the reuse of material from the ruins must have taken place soon after the event which created the ruins and not more than half a century later. Their conjecture is in our opinion quite arbitrary, precisely because of evidence that long periods could elapse before rebuilding work took place or materials were reused. In our search for further information about this earthquake we examined published documents from the papal chancery, in case there had been some papal initiative on behalf of the abbey at Subiaco; but our research produced no positive results. Neither the *Regesta pontificum Romanorum* for Latium (ed. Kehr 1907), nor the *Regesta pontificum Romanorum ab condita ecclesia* (ed. Jaffé 1888), nor the *Acta pontificum Romanorum inedita* (ed. Pflugk-Hartung 1881-88) contain references to this earthquake. The results of archaeological research into the structures forming Nero's villa (Fiore Cavaliere and Mari 1996) have suggested that landslide damage was caused by the earthquake recorded in the *Chronicon Sublacense*. During their investigation they found a continuous crack extending the full height of the walls, which suggested to them that a landslide had been responsible for the partial collapse of the mass of rock on which the villa stood, and that the landslide might have been activated by an earthquake. However, there is no chronological information that we can use as a point of reference; and since the villa buildings were used throughout the early Middle Ages and beyond, the authors suggest that if the landslide they have identified was activated by an earthquake, it must have been the one recorded in the *Chronicon Sublacense*. However, there is no convincing evidence to support this suggestion.

How the false earthquakes of 1216 originated

The date 1216 became attached to an earthquake at Subiaco as a result of an incorrect interpretation of the codex *Excerpta historica ex vetustissimo kalendario* in the Biblioteca

Ambrosiana (Milan). It was published by Muratori (*RIS* vol.I, part 2, 1725, p.235), and records an earthquake which occurred in Italy on 4 January in that year. This misinterpretation has given rise to two separate historiographical traditions: an earthquake at Subiaco in 1216, and an earthquake in "Italy" in 1216. The tradition that the earthquake responsible for the collapse of the church attached to the monastery of S.Clemente at Subiaco happened in 1216 goes back to Moroni (vol.70, 1856), but he does not identify his source. In all probability, Moroni combined the information about damage at Subiaco, as recorded in Muratori's edition of the *Chronicon Sublacense*, with that about an earthquake in "Italy" on 4 January 1216, as recorded in the *Excerpta*. Baratta (1901, p.30) took from Moroni (1856) the report of an earthquake at Subiaco in 1216, and from Baratta it came to Postpischl (1985, p.28). The information recorded in the *Excerpta* about an earthquake in Italy on 4 January 1216 was directly accepted by Mercalli (1883, p.222) and indirectly (via Giulini 1855), by Baratta (1901, p.30), who, however, records both traditions. An analysis of the sources now permits us to correct these misinterpretations. The date 1216 for an earthquake at Subiaco is surely wrong, resulting from a misinterpretation of Moroni; for there is no report of any earthquake at Subiaco around that year. And the information about an earthquake located simply in Italy in 1216 must also be judged wrong. For if we examine carefully the second and more thorough edition of the Milan codex published by Jaffé (1863) with the title *Notae Sancti Georgii Mediolanenses*, we find that the date of the earthquake is in fact given as 3 January 1216. Now that day and month coincide exactly with those of the extremely famous earthquake of 3 January 1117 (see the entry concerned), and so we are strongly inclined to believe that this is a doublet, especially since its location is so generalised ("Italy"). We are therefore confident in suggesting that there was no earthquake either at Subiaco or in the Lombardy region in January 1216. Although Di Giovambattista and Tertulliani (1996) and Di Giovambattista *et al.* (1997) recognise, slightly inaccurately, that the report of an earthquake at Subiaco cannot be substantiated, they seem to think the information about the Lombard region is acceptable.

An incorrect interpretation of the *Chronicon Sublacense* and the false earthquakes of 1227 and 1228 at Subiaco

The dating to 1227 or 1228 of the earthquake which caused the collapse of the church of Ss.Cosma e Damiano at Subiaco comes from Cherubino Mirzio, a 17th century scholar who compiled a work on events at the abbey of Subiaco up to 1628. Mirzio's manuscript was published in 1885 by Crostarosa and Allodi with the title *Cronaca Sublacense*. Probably relying on a manuscript of the *Chronicon Sublacense*, Mirzio incorrectly interpreted the passage we have already referred to, for he made the date of the earthquake coincide with the first year of the reign of pope Gregory IX (who became pope on 21 March 1227), thereby suggesting that the earthquake occurred in 1227 or 1228. But, as we have seen, the person named in relation to the collapse of the church was actually Abbot Oddo. The dates 1227 and 1228 have not found their way into seismological literature, but they do appear in erudite historiographical compilations about Subiaco (see, for example, Gori 1855). Thus, a correct interpretation of the passage from the *Chronicon Sublacense*, as set out above, completely excludes the possibility of an earthquake at Subiaco in 1227 or 1228.

▲
1160 10 15

localities	lat.	long.	I	localities	lat.	long.	I
Subiaco	41 55	13 06	B (VIII)	Ceccano	41 34	13 20	VI-VII?

1161 01 16

localities	lat.	long.	I
Ceccano	41 34	13 20	VII?

< 083 > **c.1160 or 1165 an unspecified night Paphos [Cyprus] ▷ landslide <**

source Neoph. Enkl., in Delehayé (1907, p.211)

literature Petit (1899); Delehayé (1907); Hill (1972); Ducellier (1980)

catalogues d. *Ambraseys (1965); *Ben-Menahem (1979)

catalogues p. Bektur and Alpay (1988)

During an unspecified night, possibly in the year 1165, the island of Cyprus was struck by a strong earthquake: in the fortress of Paphos, the church of the Blessed Virgin, popularly known as Limeniotissa, collapsed; and another 14 churches collapsed in the province of Paphos. We have no information about minor secular buildings. At Enkleistra, there was a landslide. Another seven very strong shocks were felt that night.

Information about this earthquake is to be found by Delehayé (1907) in a menology in the Bibliothèque Nationale in Paris, manuscript *Graecus 1189*, written by Neophytus Enkleistus, a Cypriot saint and hagiographer, who experienced the earthquake himself. His work includes an oration on earthquakes (fols.129-34, in Delehayé 1907, pp.207.7-212.21), in which, after mentioning some large earthquakes at Byzantium from the 4th to the 9th century, he adds his own evidence about an earthquake in Cyprus in his own day:

"However, now that I have collected together some information about the worst earthquakes of the past and presented it in this discourse, I now move on to speak of what I saw with my own eyes or simply heard. For at the beginning of my confinement at the Enkleistra, an earthquake suddenly occurred at the fourth hour of the night — so violently that I nearly fell headlong from my rock. There were seven similar shocks that night, and fourteen churches collapsed throughout the province of Paphos. At that time, the very large church of the Blessed Virgin in the fortress of Paphos, which the people call Limeniotissa, also collapsed. At that time, many people thought I had been killed by a landslide which had swept down even into the Enkleistra cave. Indeed, everything caught in the landslide was crushed to pieces. Consequently people came to me in the morning, and seeing that the rocks which I had placed like a dome over the entrance to the cave had not collapsed, they gave glory to God and asked the cause of the earthquake [there follows a story about Neophytus, and then a reference to the earthquake at Antioch on 29 giugno 1170]".

Καὶ ταῦτα μὲν ἐκ τῶν προγενεστέρων φοβερωτάτων σεισμῶν ὀλίγα ἐκ πολλῶν συλλεξάμενος ἔγωγε καὶ ἐν τῷ παρόντι λόγῳ συνταξάμενος συνοπτικῶς ἐπέιγομαι φάναι καὶ ἀφ' ὧν εἶδον αὐτόπτως καὶ ἀφ' ὧν ἤκουσα ἀτεχνῶς· κατ' ἀρχὰς γὰρ τῆς ἐν τῇ Ἐγκλείστρᾳ καθείρξεώς μου πρὸς τετάρτην τῆς νυκτὸς ὄραν τοσοῦτος ἐξαίφνης ἐπηνέχθη σεισμός, ὡς μικροῦ δεῖν ἐπὶ πρόσωπόν με πεσεῖν ἀπὸ τοῦ χαραδρίου μου ἐπὶ τὴν γῆν. Γέγονε δὲ ὁ τοιοῦτος σεισμός ἐν τῇ νυκτὶ ἐκείνῃ ἕως ἐπτάκις καὶ κατέπεσον δέκα καὶ τέσσαρες ἐκκλησίαι καθ' ὅλης τῆς ἐπαρχίας Πάφου. Τότε γὰρ καὶ ὁ μέγιστος κατεστράφη ναὸς τῆς ἀχράντου Θεοτόκου, ὁ ἐν τῷ φρουρίῳ τῆς Πάφου, ἣν λιμενιώτισσαν καλοῦσιν οἱ λαοί. Τότε γὰρ ἐτόπασαν πλείστοι ἀναρεθῆναί με τῇ νυκτὶ ἐκείνῃ ὑπὸ τοῦ σαθροτάτου κρημοῦ καὶ τοῦ τῆς Ἐγκλείστρας σπηλαίου· ἦσαν γὰρ τότε τὰ πάντα τεταριχενμένα καὶ σεσαθρωμένα. Διὸ καὶ ἤκασι πρὸς μέ τινας ἅμα πρῶτ. Ἰδόντες δέ, ὅτι οὐδὲ οἱ λίθοι πεπτώκασιν, οὕς τρουλλοειδῶς τέθηκα ἐγὼ περὶ τὰ πρόθυρα τοῦ σπηλαίου, ἐδόξαζον τὸν Θεὸν καὶ ἠρώτων τὴν αἰτίαν μαθεῖν τοῦ σεισμοῦ.

The date of the earthquake is somewhat debated amongst scholars. Hill (1972, I p.311) observes that this earthquake could be related to that of 1156-57, but that in any case Neophytus settled at Enkleistra after that date.

According to Ducellier (1980, p.108), the date of the earthquake lies between 1159 and 1162. Indeed, Neophytus withdrew to the cave near Enkleistra on 24 June 1159,

and construction of the hermitage was not completed until 14 September 1160 (Petit 1899, p.258). Delehayé (1907, p.288) consequently dates the earthquake to about 1160. It should also be noted that Neophytus lived in the cave for five years (Petit 1899, p.258). Since the Antioch earthquake is referred to earlier in the text as having occurred "a short time afterwards", it would seem to coincide with that of 29 June 1170, and so we could perhaps date this earthquake to around 1165; for even though Neophytus says that he had left his first hermitage to seek the relics of the Cross (Petit 1899, p.258), it seems more likely that his departure was caused by the collapse. Ambraseys (1965, p.29), followed by Ben-Menahem (1979, p.289), dates the earthquake to 1183, but this is in contradiction to Neophytus' statement that it happened towards the beginning of his life as a hermit. In 1183 — the twenty-fourth year of his retirement from the world — a new monastery was inaugurated. Furthermore, the Neophytus manuscript does not date to 1189, as Ambraseys (1965) maintains: that is simply the number of the Greek manuscript.

▲ c.1160 or 1165

localities	lat.	long.	I	localities	lat.	long.	I
Paphos	34 43	32 34	A (IX)	Enkleistra	34 51	32 27	EE

(084) **1162 Constantinople [north-western Turkey]**

sources Cinnamus, *Epit.*, p.206; Nic. Chon., *Hist.*, p.119

This earthquake proves to be unknown both to historiographic studies and to the seismic catalogue tradition.

On an unspecified day in the year 1162, a strong earthquake struck Constantinople, causing many houses to collapse. The earthquake occurred on the day when the Emperor Manuel I Comnenus (1143-1180) and the sultan of Iconium Kilij Arslan II [Yakob Hassan] (1156-1192) entered Constantinople in triumph to celebrate the truce agreed between the two rulers. The sultan went on to spend three months at Constantinople.

Information about this earthquake is to be found in two contemporary Byzantine historians: John Cinnamus, who was secretary to the Emperor Manuel I and wrote a historical work about 1180-82, and Nicetas Choniates, who lived in the second half of the 12th and the early 13th century.

The most detailed information comes from Nicetas Choniates:

"The earth shook, and many splendid dwellings collapsed, the atmospheric conditions were violent and unstable, and other such terrors took place that one could not pay heed to the triumph, and the mind swooned".

ἢ τε γὰρ γῆ κλονηθεῖσα πολλὰς ἐπικαταβεβλήκει λαμπροτάτας οἰκῆσεις καὶ ὁ ἀὴρ παραχώδης ἦν ἐπεικῶς καὶ ἀνώματος, καὶ ἕτερ' ἅττα ἐπισυμβάντα δείματα ἐκείνοις οὐ θριάμβοις ἠναγκάκει προσέχειν τὸν νοῦν, καὶ τὸ τῆς ψυχῆς ἐκύμαινε λογιζόμενον.

John Cinnamus simply records:

"When it was late at night, an immense upheaval suddenly shook the earth".

ἐπειδὴ γὰρ πόρρω τῶν νυκτῶν ἦν, ἐξαίσιός τις βρασμός ἀθρόον ἐκλόνησε τὴν γῆν.

▲ 1162 — —

localities	lat.	long.	I
Istanbul	41 02	28 57	VII-VIII

< 085 > **1163 August Antioch area [southern Turkey] > fissures <**

sources *Epist. ad Ludov. VII*, in PL 155: no.9 of Bertrand of Blanquefort, cols.1269-70; no.3 and no.12 of Amalric I, cols.1265-6, 1271-2; no.24 of Bohemond III, col.1280
historiography Röhricht (1893); Röhricht (1898)
catalogues d. Sieberg (1932a)

This earthquake does not appear in recent seismic catalogues.

In August 1163, there was a destructive earthquake in the mountains and plains in the territory of the principality of Antioch. Fortifications, castles, towers and towns were reduced to ruins; and Antioch itself was badly damaged. There were many victims, but the actual number is not given. The sources are four letters sent to king Louis VII of France (1137-1180).

The letters are very similar in content, and date to the period between September-October 1163 (Röhricht 1893, nos.383, 384) and August 1164 (Röhricht 1893, no.392). Evidence contained in the one dating to April 1164 (Röhricht 1893, no.396), seems immediately to suggest that the earthquake referred to in all these letters occurred in August 1163. For while the first two letters simply include the earthquake in their narrative of the misfortunes which afflicted the eastern Latin states at that time, placing it between the capture of Prince Rainald of Antioch by the Turks (23 September 1160) and the death of king Baldwin III of Jerusalem (10 February 1162), the third letter clearly states that it occurred the previous August (*praeterito augusto*): by which we assume the writer means the August before the time when the letter was written.

The first source is *Epistola 9* by Bertrand of Blanquefort, Grand Master of the Templars, written in September-October 1163:

"By divine will and as a consequence of the burden of our sins, after fortifications were thrown down in the earthquake, and many castles were destroyed, and huge numbers of us were crushed under the debris of walls, lo, the onslaught of the enemy's attack on us became much stronger than usual, increasing many times in ferocity".

Hinc nutu divino, nostrorum exigente mole peccaminum, terramotu dissipatae munitiones, eversa castella quamplurima, innumerique quos dirutorum murorum collisio oppressit, multiplicato eorum furore adversum nos multo acrius solito accendit.

The second source is *Epistola 3* by king Amalric I of Jerusalem, written in September-October 1163:

"An earthquake such as had never been seen before, razed castles, towers and towns to the ground, and almost everything else both in the mountains and the plains, both in Antioch and in all neighbouring places in the plains or the mountains; and, alas, a multitude of Christian men and women were condemned to a fate of sudden death: they were taken from the world, or rather, the earth swallowed them up".

A saeculo etenim inauditus terramotus, castella, turres, municipia, omnia fere tam in montanis quam in planis, tam in Antiochia quam in omnibus ei adjacentibus, tunc in planis, tunc in montanis, solo adaequavit, et innumerabilem, proh dolor! Christianorum utriusque sexus multitudinem morti improvisae addixit, et exstinxit, et, ut verius dicamus, terra tenus absorbit.

The third source is *Epistola 12*, also by Amalric I, written on 8 April 1164:

"[...] the whole of Eastern Christendom has been deeply worn down and more than usually oppressed, and its sufferings are increasing without pause, both by the misfortune, of which we know you are already informed, suffered by the illustrious Prince Rainald of Antioch, who was captured on his return from an expedition and saw almost all those who were with him killed or captured, as well as by the earthquake which, last August, shook to their foundations almost all the castles and towers and towns in the princi-

pality of Antioch, razing them to the ground. We therefore beg your Serenity and Excellency [Louis VII of France] to show your concern for that land which our Lord in person deigned to visit, make famous, and consecrate [...]”.

[...] *tota Christianitas in Oriente vehementer attrita et gravius solito oppressa, nimium atque nimium laborat, tum ex infortunio Rainaldi illustris quondam principis Antiocheni, qui ut jam vos dudum audisse arbitramur, rediens ab expeditione, captus fuit, caesis aut captis fere omnibus illis qui in comitatu ipsius erant, tum et ex terraemotu, qui in praeterito Augusto, totius principatus Antiocheni castella, turres et municipia fere omnia funditus evertit soloque coaequavit, rogamus serenitatem celsitudinis vestrae, ut pro terra illa quam Dominus sua corporali presentia visitare, illustrare et consecrare dignatus est [...] sollicitus sitis [...]*.

The fourth source is *Epistola 24* by Bohemond III, son of Prince Raymond of Antioch, dating to between August 1163 and August 1164:

“You also know, sire, as I believe, and have heard well enough, the quantity and kinds of damage suffered by the lands of Antioch last year, both in the capture of the prince and the other men who were with him, and the depredations and slaughter suffered by the Christian people; both in the incredible destruction and devastation by fire and sword to which the fortifications have been subjected, and the extraordinary earthquake which razed to the ground almost all the defences and castles in the principality of Antioch. But I will say no more of that for the present”.

Scitis equidem, domine, ut credo, ac satis audistis quae et qualia damna in finibus Antiochiae in transacto anno acciderint, tum videlicet in captivitate principis et aliorum virorum qui cum eo erant, et in tanta populi Christiani depraedatione atque exterminatione; tunc etiam in tanta munitionum igne ferro destructione atque extirpatione, tum etiam tanto terrae motu tali ac inaudito, qui fere omnes munitiones Antiocheni principatus et omnia castra solo tenus evertit. Sed de his ad praesens praetermitto.

▲ 1163 08 -

localities	lat.	long.	I	localities	lat.	long.	I
■ Antioch area	—	—	IX-X	Antioch	36 14	36 07	IX

< 086 > c.1165 - 1167 Erzinka [eastern Turkey]

source 1 Sam. An., *Comp.*, p.138

sources 2 Mxit' Ayriv, *Hist.*, p.63; Vard. Ar., *Hist.*, p.128; *Chron. min. Arm.*, II.4; p.135; Yovh. Imast., *Work*, p.134; *Chron. min. Arm.*, II.11, p.263; Ar. Tabr., *Book*, p.469

historiography Incicean (1822)

literature Abich (1882)

catalogues d. Kostaneanc' (1902); Grumel (1958); Step'anyan (1964); Zeyt'unyan (1991); Guidoboni and Traina (1995)

catalogues p. Ergin *et al.* (1967); Karapetian (1991); Shebalin and Tatevossian (1997); Berberian (1997)

In the year 614 or 615 of the Armenian era (8 February 1165 - 7 February 1166 and 8 February 1166 - 7 February 1167), a strong earthquake struck the Armenian city of Erzinka (Erzincan, now in Turkish territory). That it probably caused widespread damage is suggested by the 12,000 victims reported by the 17th century historian Gregory of Kamakh (Grigor Kamaxec'i). But it has to be pointed out that contemporary sources do not give such figures, and in any case, what Gregory tells us is proba-

bly the result of his confusing this earthquake with the destructive event at Erzincan in 1457, which is indeed recorded as having caused the death of 12,000 people.

Our principal source for the earthquake is the contemporary evidence provided by Samuel of Ani (12th century), who states:

"In the year 614 [8 February 1165 – 7 February 1166], there was an earthquake at Eznkay".

Ի ռժղ թւիւն եղև շարժ յերզնկայն.

Similarly, Mxit'ar Ayrivanec'i (13th century, p.63) reports:

"The earthquake took possession of Eznkay".

Շարժ տարաւ զեզնկայ.

Vardan Arewelc'i (13th century, 75, p.128) also echoes Samuel of Ani. The chronicle known as the *Annals of the Anonymous of Sivas* (13th century, *Chron. min. Arm.*, II.4, pp.135.1-2) reports:

"In the year 615 [8 February 1166 – 7 February 1167], there was a terrible earthquake and Ernkay was destroyed".

Ի թուիւն Ռժե ահազիւն շարժ եղև և կործանեցաւ եզնկայն.

Further uncertainty about the date of the earthquake is created by what we find in the chronicle of Yovhannes Imastaser (13th century, p.134), for he dates it to the year 617 of the Armenian era (8 February 1168 – 7 February 1169). This same date was taken up by the above-mentioned chronicler Gregory of Kamakh (17th century, *Chron.min.Arm.* II.11, p.263.27-28), who added that there were 12,000 victims. The same number 12,000 recurs for the Erzincan earthquake of 1457, though Gregory himself puts the death toll even higher, at 32,000. Since he was a later author, he could have confused the figures.

Finally, Arakel of Tabriz (Arak'el Dawrizec'i, 17th century, p.469.9-11) created a doublet by firstly reporting:

"In the year 615 [8 February 1166 – 7 February 1167], there was an earthquake at Eznkan":

Թուիւն Ռժե շարժ եղեւ յեզնկան

and then later in his chronicle:

"in the year 617 [8 February 1168 – 7 February 1169], there was a terrible earthquake at Eznkan. 12,000 people died".

Թուիւն Ռժէ շարժ եղեւ յեզնկան.

On the basis of this source, Grumel (1958, p.480) identified two separate events. The two dates usually given for the earthquake (cf. Incicean 1822, p.17; Zeyt'unyan 1991, p.80) are 1166 or 1168, the confusion being due to the different chronological conventions used by individual authors, and especially to the doublet created by Arakel of Tabriz, who reported an earthquake at Erzincan in both 615 and 617 of the Armenian era (Abich 1882, p.442; Step'anyan 1964, p.59; Ergin *et al.* 1967, p.17, nos. 143-145, go so far as to register four different earthquakes in the same locality, i.e. in 1161, 1165, 1166 and 1168).

Arakel probably introduced the doublet by failing to reach a decision on one date or the other.

▲ c.1165-1167

localities	lat.	long.	I
Erzincan	39 44	39 30	IX

< 087 > 1169 February 4 Catania eastern Sicily [Italy]

> tsunami, changes in the flow of springs,
landslide of the crater of Etna volcano <

- sources 1 Pet. Blois, *Ep.* 90, col.282; *Ep.* 46, cols.135-6; Romuald Sal., *Chron.*, p.258; Falcando, *Hist.*, p.164; Marag. Bern., *Ann.*, p.47; Falcando, *Epist.*, p.175; *Notula* in Evangelatou-Notara (1982, p.209, no.428); *Chron. quod dicitur* [W. Godell], p.198; Roger Hov., *Chron.*, pp.141; Rob. Torig., *Chron.*, p.518; *Ann. S.lac. Leod.*, p.642; *Ann. Vizel.*, p.228; *Ann. Casinen.*, p.312; *Lamentatio*, in Selvaggio (1542) and in Fasoli (1954, doc.III, p.145); Ibn Jubayr, *Rihla*, p.325 three documents in Guillou (1963, docs.12, 13, 19); one document in Spata (1870, doc.4); one document in Caruso (1976)
- inscriptions CIG 4.8737, 8738; Mentzou-Meimari (1977-79, p.124, no.234; p.125, no.240)
- sources 2 Rob. Aux., *Chron.*, p.240; *Ann. Siculi*, p.116; Lamb. Parv., *Ann.*, p.648; *Ann. Wigorn.*, p.465; *Ann. Teokesb.*, p.465; *Chron. univ. Metten.*, p.518; Martin Tropp., *Liber*, II, p.450; Vinc. Beauv., *Spec. hist.*, p.1191; Martin Tropp., *Chron.*, p.437; *Flores temp.*, p.239; *Ann. Caven.*, p.192; Will Nang., *Chron.*, I, pp.61-2; Riccob. Ferr., *Pomar.*, cols.125, 174; Bezanis, *Cron.*, p.28; Tol. Lucca, *Ann.*, pp.66-67; Tol. Lucca, *Hist.*, col.1108; Pipino, *Chron.*, col.627; Dandolo, *Chron.*, p.249; Malvezzi, *Chron.*, col.878; Palmieri Matteo, *Liber*, p.97; *Cron. Ramp.*, II, pp.32-3, 43; *Cron. Varign.*, II, p.4
- historiography Sanudo, *Le vite*, p.272; Fazello (1560); Maurolico (1562); Sigonio (1591); Carrera (1639); Kircher (1665); Massa (1709); Aprile (1725); Amico (1733); Pirri (1733); Caruso (1737-45); Amico (1741); Capodiceci (1816); Ferrara (1829); Cordaro Clarenza (1833); Parisi (1842); Sanfilippo (1843); Privitera (1878-79); Amari (1880); G.Agnello (1930); Di Blasi (1972); Leone (1987); Johns (1989); G.M.Agnello (1992, 1996); Arcifa (2001)
- literature Lombardo (1985); Guidoboni and Boschi (1989); Guidoboni and Mariotti (1993); Boschi *et al.* (1993); Guidoboni (1996); Valensise and Guidoboni (2000); Guidoboni (2001); Guidoboni and Mariotti (2001); Guidoboni *et al.* (2001)
- catalogues d. Filippo da Secinara (1652); Magnati (1688); Bonito (1691); Mongitore (1743); von Hoff (1840); Perrey (1848); Mallet (1853); Capocci (1861-63); Mercalli (1883, 1897); Baratta (1901); De Stefano (1987); Alexandre (1990); *Boschi *et al.* (1995, 1997, 2000)
- catalogues p. Giorgetti and Iaccarino (1971); Carrozzo *et al.* (1973); Postpischl (1985); CPTI (1999)
- catalogues Ts Caputo and Faita (1984); Bedosti and Caputo (1986); Tinti and Maramai (1996); Soloviev *et al.* (2000)

This destructive earthquake is recorded in many contemporary sources, and news of it soon reached northern Europe (see fig. 35). Although very destructive and widely referred to in modern historiography, it has not aroused much interest amongst the medieval Italian historians or art historians of today. One of the few exceptions is the study by Agnello (1996), who provides a discussion of the primary and secondary sources, and of the relevant historiography. This study is not exhaustive, however, because it does not involve an examination of documents and inscriptions; and unfortunately it proves to be rather hurried in some ways, particularly as regards an assessment of the sources describing the area of effects and the tsunami.

As regards the more specific sphere of historical seismology, studies of this earthquake first appear in the 1990s. Within the sphere of the study of seismic effects in Sicily, especially as regards the Syracuse area, the earthquake has been analysed by Guidoboni and Mariotti (1993), Boschi *et al.* (1993), and Boschi *et al.* (1995), and their work has found its place in the *Catalogo dei forti terremoti in Italia* (Boschi *et al.* 1995), now in Boschi *et al.* (2000). Guidoboni (2001) has provided a further critical review of the event, together with a more accurate picture of its effects.

Effects of the earthquake

On 4 February 1169, at about 7:00 UT (i.e. 8:00, local time; about the first hour, in canonical time), a violent earthquake struck eastern Sicily. Catania, which lies at the foot of

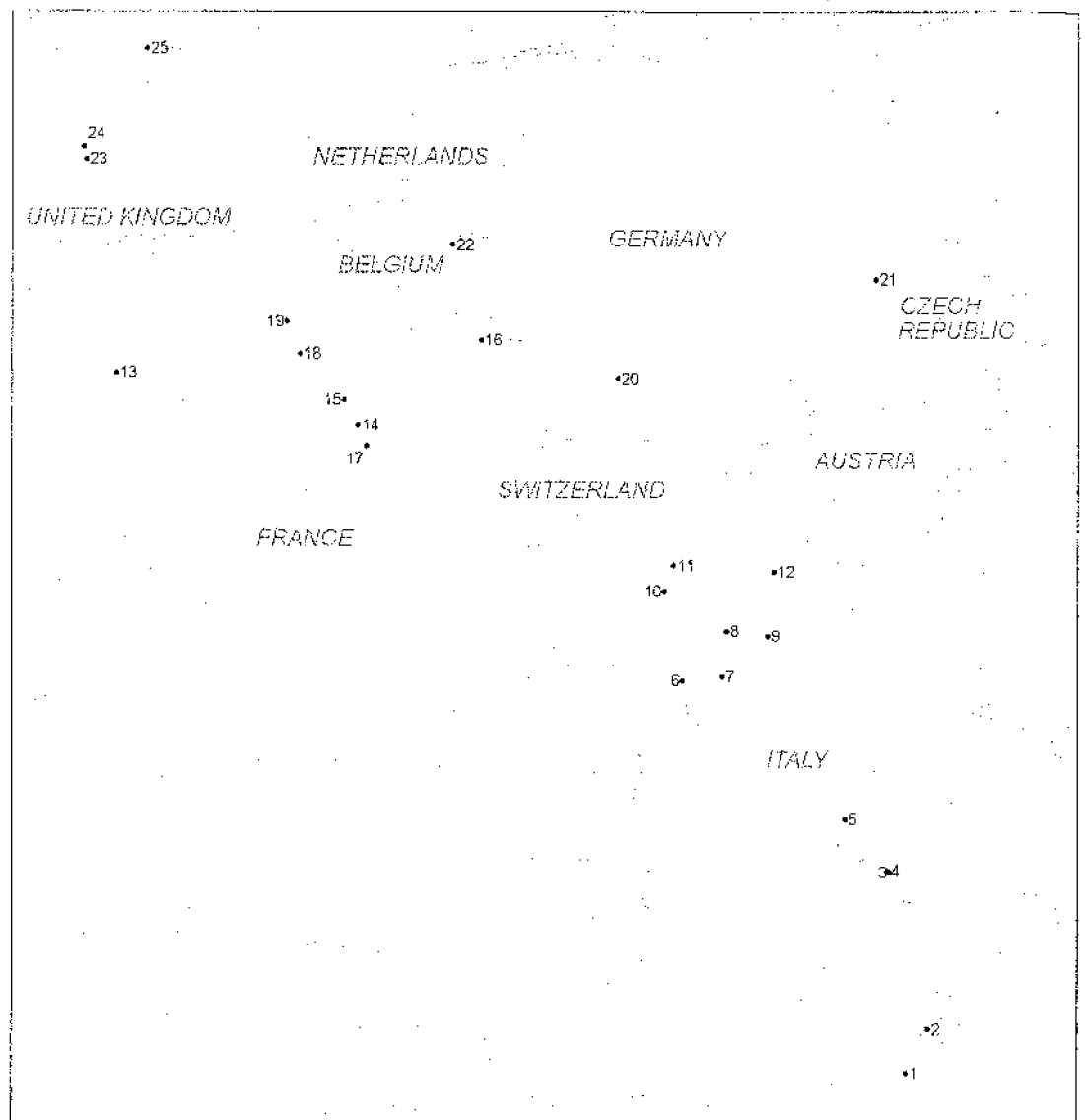


fig. 35 Distribution of 12th-15th century monastic annals and chronicles which record the earthquake of 4 February 1169 (within present-day states). Obviously, this area of distribution does not coincide with that of local effects, but it highlights the great fame of the earthquake in medieval Europe.

1 Catania	8 Bologna	15 Sens	22 Liège
2 Messina	9 Ravenna	16 Metz	23 Tewkesbury
3 Salerno	10 Cremona	17 Vézelay	24 Worcester
4 Cava de' Tirreni	11 Brescia	18 St-Denis	25 Howden
5 Montecassino	12 Venice	19 Beauvais	
6 Pisa	13 Mont-St-Michel	20 Tübingen	
7 Florence	14 Auxerre	21 Prague	

Etna volcano, was the most seriously affected city, and the sources describe it as being completely destroyed. According to contemporary sources, effects at Catania were very serious and widespread: Ugo Falcando (*Historia*, ed. 1897) describes the city as *opulentissima*, and says that its interior was so badly damaged (*subversa*) that not a single house was left habitable (*ne una quidem domus in urbe superstes remanserit*). The other sources also report that the city was destroyed "to its foundations" (Romuald of Salerno,

ed. 1909-35; Bernardo Maragone, ed. 1930-36). These images clearly tend to convey the overall dimensions of the disaster rather than a realistic description. The destruction of Catania was also commemorated in a poem. According to Arcifa (2001), the city of Catania covered a much smaller area at that time than it does today (see fig. 36). In describing the destruction of the city, Falcano (*Epistola ad Petrum*, ed. 1897) provides some items of information about the nature of the built-up area: the principal building materials must have been stone (probably of lava origin) and timber (*lignorum ac lapidum moles*). However, the sources provide information about damage at only 2 specific buildings: the cathedral of S.Agata and the church of S.Stefano protomartire. The cathedral of S.Agata was built over the remains of some Roman baths between 1086 and 1093 on the orders of the Norman count Roger I; and it was consecrated on 15 May 1094. It was a three-aisled church having an overall length of 96 m along the nave and a width of 40.40 m from one end of the transept to the other. That it was a fortified church (*ecclesia munita*) is shown by the outer walkways above the crenellated apses, and the two solidly built three-storey structures added to the ends of the transept and provided with loopholes. The earthquake of 1169 caused the complete collapse of the vaulting over the three aisles; and the side walls almost completely collapsed as well. Only the three apses and the structures at the ends of the transept remained standing: they survive to this day. The surviving parts of the church also had to withstand the earthquake of 1693 (Guidoboni *et al.* 2001), and they still betray the original military nature of the building. Recent archaeological excavations have made it possible to identify decisions that were made during reconstruction work after the 1169 earthquake, during the period (1194-1282) of Swabian domination. The debris from collapses was left where it lay, so the floor was raised a whole metre above the original level. Six granite columns – now incorporated into the first order of the façade – were re-used, but left in their original position, emerging from the ruins. But collapses resulting from the 1693 earthquake mean that very little of the parts rebuilt after the 1169 earthquake can be seen today. The little that survives includes the small columns behind the portal of the cell of S.Agata in the chapel of that name, some remains on either side of the main entrance, and two stretches of the inside of the front wall (Leone 1987). There is an inscription which bears witness to the restoration or complete rebuilding of S.Stefano protomartire in 1171 (for this inscription, see the paragraph below on sources). The dedication to St.Stephen Martyr has evident associations with the Eastern Church,

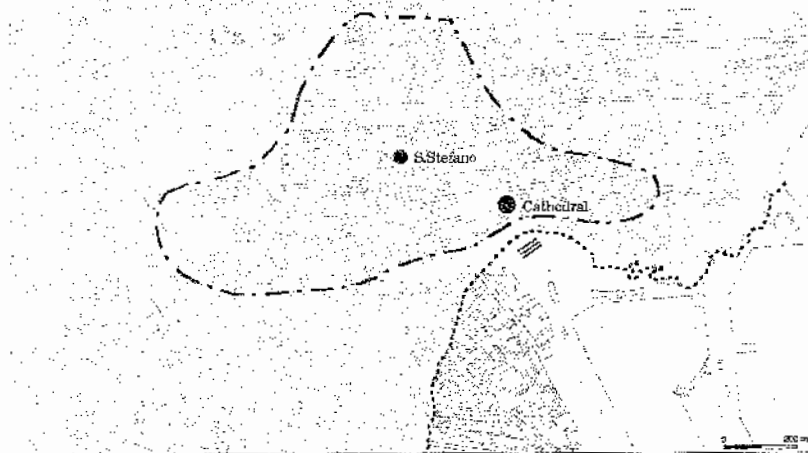


fig. 36 Catania, showing the probable urban area in the 12th century (the grey area on the plan of the present-day city, based on Arcifa 2001). The dotted line indicates the coastline at that period: an area now built on was then in the sea. The plan shows the only two monumental buildings (1. S.Stefano; 2. S.Agata) which the sources record as having been seriously damaged.

and suggests that the reconstruction of an earlier church going back to Byzantine times may have been involved; for while the cult of St. Stephen Martyr was widespread at that earlier time, there was less reason for it in the 12th century. These factors make it seem likely that the church of S. Stefano was of Byzantine origin, suffered serious damage in the earthquake of 1169, and was restored or rebuilt two years later.

The survival of two other buildings helps to provide further information about the urban seismic scenario, which has been "flattened" by the chronicle sources, with their generic description of destruction "to the foundations". Two buildings remained intact in the 1169 earthquake, its effect on them probably being limited by their structural nature: one was the little round church of S. Maria della Rotonda, built of large stone blocks and with a hemispherical dome; the other was the Chapel of Our Saviour or Bonaiuto Chapel. Before it was rebuilt in the 18th century, the latter was in the form of basilica with three apses, and measured no more than 8 m along the side (Guidoboni 2001, pp.62-4). There were also tsunami effects at Catania (see the paragraph below on environmental effects).

Part of Syracuse was damaged: according to Bernardo Maragone (ed. 1930-36), the earthquake destroyed "a certain part" (*quaedam pars*) of the city: perhaps 50 or 60 per cent of buildings (about 400 or 500 houses). Most of the castle, which can be identified as the fort which was subsequently called "Marieth", also collapsed (Guidoboni and Mariotti 1993).

The effects of the earthquake at Messina were massive and very visible. According to Romuald of Salerno, the earthquake was "very great and imposing" (*maximus et manifestus*). The destructive effect on buildings there can only be conjectured from a series of 12th and 13th century deeds which refer to a "new castle" from 1178 onwards. This may mean that part of the city was rebuilt, and mention in a contract of sale of 1176 of houses having been destroyed may be a reference to earthquake damage. There are also reports of tsunami effects.

There was also serious damage at Modica, Lentini and Piazza Armerina. An inscription in Greek records repairs to the monastic building of Santi Pietro e Paolo d'Agrò (10 km ca. north of Taormina). According to the sources, the most serious damage occurred in the area stretching from Catania, on the east coast, to Piazza Armerina, in central Sicily. Within this area, 11 castles, fortified settlements and other villages are mentioned as having suffered serious damage, but they are not named. The earthquake also affected Calabria, and was felt in fortified villages around the city of Reggio. The death toll was very high. We are told that there were about 15,000 victims at Catania, whereas the number of victims at Lentini is not specified.

Environmental effects

Substantial environmental effects are also recorded. At Catania and Messina, there was a tsunami. We are also told of changes to subterranean water. Part of the summit of the crater of Etna volcano probably also collapsed on the northern side, facing Taormina.

Tsunami

The tsunami affected both Catania and Messina. There is a wealth of reliable evidence for the effect of the tsunami at Messina, but only one source for Catania: the contemporary chronicle by Roger of Hoveden (ed. Liebermann 1885). We therefore devoted particular attention to this phenomenon.

According to the English chronicler Roger of Hoveden (d. between 1202 and 1212), the sea receded from the shore at Catania, leaving many fish behind on the sandy bed. People from the city's surroundings gathered to take the fish, but were swept away when the sea suddenly flowed back. Contemporary Italian sources do not report this phenomenon, but in our view that is not in itself a reason for rejecting it: it rather suggests the existence of a different tradition, on which the English chronicler was dra-

wing. In fact, an analysis of the contemporary sources which record the 1169 earthquake shows that even the most authoritative of them do not belong to a local Catania tradition, but probably drew on broader news circulation, fed by the fame which the destruction of Catania immediately acquired. It is also the case that the details in Roger's report about the year of the earthquake and the number of victims differ from what one finds in other contemporary sources. However, a consideration of Roger of Hoveden's work leads us to think that his report of a tsunami at Catania is acceptable. Roger was a cleric in the service of the crown. His chronicle, covering the period from 449 AD to 1201, was begun in 1192 and made use of a variety of sources. Liebermann (1885), who published part of the chronicle in *Monumenta Germaniae Historica*, nevertheless failed to identify the sources which Roger used for the period 1149-1169. Although that part of the work is not always strictly chronological, Liebermann thought it a valuable contribution to our understanding of the period. In our opinion, therefore, the report of the tsunami is acceptable. Hence we do not share the view of Agnello (1996), who rejects Roger of Hoveden's report after only a hurried analysis. The passage in question also involves some uncertainty as to how far the sea receded from the shore. Roger states literally "30 passuum stadia" ("per triginta passuum stadia"), using a phrase which confuses two different units of measurement; and perhaps in doing so he is repeating an error in his sources. 30 stadia would be slightly less than 6 km — a scarcely credible figure — whereas 30 passus would be the more plausible distance of about 45 m (Guidoboni and Mariotti 2001, p.268). The suggestion that there was a tsunami at Catania fits the scenario for Messina presented by the other sources. At Messina, the sea first receded from the shore, and then flowed into the city through its gates. The sea level fell about 5 m (twenty palmi). Only the Messina tsunami appears in the catalogues of Capocci (1861-63), Caputo and Faita (1984), Bedosti and Caputo (1986), and Soloviev *et al.* (2000), but only in relation to Messina.

Changes to subterranean water

In many places, not identified, new springs spurted from cracks in the ground, while others became blocked or dried up. At Syracuse, the water in the Fountain of Arethusa became cloudy and acquired a salty taste; and the spring of Tavi dried up for almost two hours, and then violently burst forth for an hour with reddish coloured water. This spring was at the foot of the castle also called Tavi, the ruins of which are still visible near the village of Leonforte.

Landslide of the crater of Etna volcano

In his *Historia*, Ugo Falcando, who personally witnessed the 1169 earthquake, records that after the earthquake, part of the crater at the summit of Etna volcano, on the side facing Taormina, seemed to have become slightly lower (*eaque pars Ethnei cacuminis que Taurominium respicit visa est aliquantulum subsedissee*). This may perhaps mean that part of the top of the crater collapsed on the north side. What Falcando has to say, however, does not exclude the possibility that the earthquake is to be associated with some kind of volcanic eruption.

Evidence of social and economic effects

The earthquake occurred at a time in history which was both complex and much subject to conflict. Sicily was then part of the Norman kingdom, and William II was king in 1169. Catania had been given by the Normans to the bishop of the city, who also had jurisdiction over a large part of the surrounding territory, this having been granted by count Roger I in 1091. Under the Normans, Messina was Sicily's principal port, and had substantial Genoese and Venetian colonies. It was here that the *strategus* (army commander) had his chancery, and he was directly employed by the *regnum*, which nevertheless allowed a certain administrative freedom to local authorities. The body in supreme command of the galleys had its seat at Messina, as did the archimandrite. He controlled most

of the Greek monasteries, which were subject to that of S.Salvatore. The archbishop had jurisdiction over many neighbouring villages, such as Bordonaro, Zaffaria and Mili. Different authorities were thus to be found at Messina, and they were liable to clash with one another. In 1168, during the regency of Margaret of Navarre for her son William II of Hauteville, there were serious disturbances at Messina, to the extent that in March of that year the royal family was obliged to leave the city and take refuge in Palermo. Catania, on the other hand, was a minor city, with a large number of families of Arab origin. Count Roger had given the fief to the bishop, and the latter also had jurisdiction over many villages in the surrounding countryside. There is evidence of serious social tensions there at the time of the earthquake.

When the earthquake struck, the settlement network was scantier than in later centuries, and important territorial and social changes were in progress. The process of reorganising Sicily's economy, together with other destabilising factors, contributed to the strong symbolic value given to the earthquake in the texts which recorded it.

Contemporary or slightly later sources do not allow us to deduce with any accuracy the extent to which the settlement structures of eastern Sicily were destroyed by the earthquake, because at this period they lack a broad territorial spread, and so the descriptions in the chronicles cannot be put together to provide a general picture.

Although the sources do not permit a clear delineation of the earthquake's effect on the social and economic context of the time, the available items of evidence do show that this context was substantially involved and affected.

Historical sources: an overall view

The primary sources for this earthquake are many and of various kinds. An examination of the principal collections of 12th century Latin and Greek documents about Sicily elicited five items of interest. In addition, there are thirty or more contemporary or slightly later chronicle sources which describe effects in more or less detail. Two Greek inscriptions bear witness to the restoration of two buildings during the years immediately after the earthquake. A verse composition commemorates in poetic terms the impact of the earthquake on the population of Catania, and conveys its dramatic quality. And there is also a brief *Notula* in Greek, as well as a contemporary Arabic source which is difficult to assess. There are also twenty or so later texts (13th-14th century, see sources 2) which record the earthquake without providing fresh information about it.

Latin sources

ARCHIVAL DOCUMENTS

Our research involved examining the principal 12th century collections of Latin and Greek documents about Sicily, paying particular attention to the archives of certain monasteries which were amongst the most important centres of economic activity at the time. Documentary evidence proved difficult to find. Only in some Greek documents from the monastery of S.Salvatore at Messina (Guillou 1963), dating to a few years after the earthquake, do we find mentioned the reconstruction of the city's fortified area, the *kastron*. From 1178 onwards, we find several references in documents about Messina to the "new" castle, with attached houses and shops (Guillou 1963). This shows that part of the city was rebuilt in the 1170s, and we may relate this to damage caused by the earthquake of 1169. A reference to "destroyed houses" in a deed of sale of 1176, also from Messina, may also be related to earthquake damage (Spata 1870). But, as so often happens in documents like these, none makes specific reference to an earthquake.

ANNALS AND CHRONICLES

Of fundamental importance amongst the contemporary annals and chronicles is the *Historia* of Ugo Falcando, written after 1181. He was the most eminent historiogra-

pher of the Kingdom of Sicily and personally experienced the earthquake. Falcando also deals with the earthquake in his *Epistola* of about 1190 to Pietro, church treasurer at Palermo. Other primary sources for the earthquake are the *Chronicon* of Romuald of Salerno, archbishop of that city, who wrote the last part of his chronicle after 1177, and the *Annales Pisani* of Bernardo Maragone. They were written in the 1180s, and bear witness to Pisa's strong interest in the Mediterranean.

Another contemporary author in Sicily at the time of the earthquake was Peter of Blois. He was tutor to William II and returned to France in 1169. His most substantial account is in *Epistola 46* (addressed to the bishop of Syracuse and probably written in 1173). A brief and veiled reference to the earthquake can perhaps be identified in his *Epistola 90*, written to his brother William in 1169, the year of the earthquake. But the evidence he provides is of little value, because his strong dislike of the Sicilians meant that his primary concern was to emphasise that the wrath of God was being directed against them. There are other contemporary sources which make briefer reference to the earthquake than those already indicated. We mention here only those which belong to the 12th century and also serve to illustrate how famous the earthquake was amongst European chroniclers. The most significant of these is the chronicle wrongly attributed to William Godel. It was in fact written by an anonymous monk who lived at Sens in France, and was published in part by Holder-Egger (1882). There is also information about the earthquake in: the *Chronica* of Robert of Torigny (also called Robertus de Monte) of the abbey of Mont-St-Michel; the *Annales Sancti Iacobi Leodiensis* from the monastery of St. Jacques at Liège in Belgium; and the *Annales Vizeliacenses* from the monastery of St. Pierre at Vézelay in France. There is also an echo of the earthquake in England in the *Chronica* of Roger of Hoveden (present-day Howden, in Yorkshire). And there is a very general reference to the earthquake in the *Annales Casinenses*, the chronicle of the Benedictine monastery of Montecassino.

Set out below are the texts of those contemporary sources which contribute most to establishing the effects of the earthquake.

Amongst the 12th century sources closest to the event is a letter (*Epistola 46*) written by Peter of Blois to the bishop of Syracuse — perhaps in 1173 — when he was almost certainly in England, where he became a diplomatic agent in the service of Henry II.

"Throughout the land and to the ends of the earth news has already spread of the disaster which not long ago struck the people of Catania in Sicily on the eve of the feast of St. Agatha, when that utterly damned bishop, brother of the notary Matthew, who, as you know, assumed that dignity without being called to it by God, as was Aaron, and who occupied that position not through canonical election, but through corruption worthy of Gehazi; when, as I say, he offered the incense of abomination, the Lord thundered from heaven, and behold there was a great earthquake. Indeed, the Angel of the Lord, striking the bishop because of God's wrath, swept him away together with the populace and the whole city. It is indeed clear that this happened because by their wicked sins they had caused offence to the blessed Agatha".

In omnem terram, et in fines orbis terrae jam exiit plaga illa, qua nuper in Sicilia percussi sunt Catanenses in vigilia B. Agathes, cum episcopus ille damnatissimus, frater Matthaei notarii, qui, sicut scitis, sibi sumpsit honorem non vocatus a Domino tanquam Aaron, et qui ad sedem illam non electione canonica, sed Giecitica venalitate intravit; cum, inquam, abominationis offerret incensum, intonuit de coelo Dominus, et ecce terraemotus magnus factus est. Angelus enim Domini, percutiens episcopum in furore Domini, cum populo et universa civitate subvertit. Patet itaque, quia beatissimae Agathes offensam suis exigentibus peccatis incurrerant.

There is a reference to destruction caused by the earthquake in *Epistola 90* written by Peter of Blois to his brother William:

"That same land [Sicily] swallows up its inhabitants, and while I was there I was in

fear of the wickedness of its people, and so the greatest of my desires was to be free to return in safety."

"Terra siquidem illa devorat habitatores suos, timensque a malitia inhabitantium in ea, in hoc redegeram meorum desideriorum summam, ut haberem licentiam, et cum securitate recessum."

The most detailed information is contained in the *Historia* of Ugo Falcando:

"[...] On the fourth day of February in that year, towards the first hour of the day, an earthquake struck Sicily with such violence that it was also felt in the villages around Reggio in Calabria. The very wealthy city of Catania was so badly shaken that not a single house within it was left unscathed. About 15,000 men and women were buried in the ruins of buildings, together with the bishop of the city and most of the monks. Lentini, that noble town belonging to the Syracusans, was destroyed by these same shocks, and so large were the buildings which collapsed that they killed many (of the inhabitants). Many villages were reduced to ruins in the territory of Catania and Syracuse. The earth split open in many places, causing new springs to spurt forth and blocking some old ones, and that part of the summit of Etna which faces towards Taormina seemed to become lower. The celebrated Fountain of Arethusa at Syracuse, which is supposed to have reached Sicily through underground channels from the city of Elis in Greece, acquired a salty taste by becoming mixed with sea water. The Tavi spring, which issues forth at the foot of the mountain, near Casale dei Saraceni, was abundant with water at that time, but held its waters back, staying dry for almost two hours. Then, to the amazement of the watching inhabitants, it caused its waters, now of a reddish colour, to burst forth violently for an hour. At Messina, the sea had also been very calm up to that time, but now it first drew itself together and receded a little from the shore, and then gradually flowed back beyond the shore, flooding against the city walls and flowing through the gates. Because of this and other prodigies, the frightened courtiers and their retinue thought this amazing event foretold a great disaster in Sicily".

[...] eodem anno, quarta die februarii, circiter primam horam eiusdem diei, vehemens terre motus tanta Siciliam concussit violentia ut in Calabria quoque circa Regium oppidaque proxima sentiretur. Cathaniensium opulentissima civitas usque adeo subversa est, ut ne una quidem domus in urbe superstes remanserit. viri ac mulieres circiter .XV. milia cum episcopo eiusdem civitatis maximaque parte monachorum sub ruina sunt edificiorum oppressi. Leontini, nobile Syracusanorum oppidum, eadem terre concussione subversum oppidanorum plerosque ruentium edificiorum mole consumpsit. multa preterea in finibus Cathaniensium ac Syracusanorum castella diruta sunt; multis in locis terra dehiscens et novos protulit fontes, et veterum nonnullos obstruxit, eaque pars Ethnei cacuminis que Taurominium respicit visa est aliquantulum subsedissee. Siraculis Aretusa fons nominatissimus, quem ab Elide Grecie civitate fama est in Siciliam occultis meatibus derivari, de limpido turbulentus effectus, saporem salsum multa maris admixtione contraxit. Tavius fons quidem aquis uberrimus, qui de Pedemontis iuxta Casale Sarracenorum egreditur, quasi duarum horarum spatio manens obstrusus, aquas continuit, magnoque dehinc erumpens impetu, sanguinei coloris latices per unius spatium hore mirantium oculis indigenarum exhibuit. Messane vero mare, cum tranquillissimum esset, in seipsum primo se contrahens, paulisper cessit a littore, deinde pedetemptim rediens, prefixas littoris metas transiit, murosque civitatis alluens, ipsis etiam se portis infudit. hiis aliisque prodigiis curie familiares eorumque fautores perterriti, arbitrabantur novitatem hanc rerum magnam Siculis calamitatem portendere.

Falcando also refers to the earthquake in a letter to Pietro, church treasurer at Palermo: "O thou city of the Catanians, who have experienced ill fortune so many times, without ever being able to mitigate or check your suffering in any disaster! For if we turn over the pages of the old stories in the annals we find that you were frequently laid low by

pestilential vapours and devoured by the terrible horrors of wars, and on various occasions (we have seen) fire from the cavernous furnaces of Etna flow forth towards you like a river. And if we wish to relate the ills of our time which we ourselves have witnessed, there was recently a powerful earthquake which shook you so violently that an incalculable number of victims were buried beneath the wood and stone of ruined buildings. And even now, after many different kinds of disaster, you shamefully condemn yourself to slavery in order to mitigate the iniquity of your fate".

Ve tibi Cathaniensium civitas, que adversantem toties experta fortunam nullis unquam cladibus eius sevitiā mitigare aut compescere potuisti! nam si veteres annalium revolvimus ystorias, inveniemus te frequenter et pestilentibus exhaustam nebulis, et atroci bellorum clade consumptam ignemque in te aliquotiens de cavernosis Ethne fornacibus in modum fluminis emanasse. quod si nostri temporis mala et que ipsi vidimus volumus recensere, nuper te vehemens terre motus tanta concussit violentia ut cunctis ruentibus edificiis haud facile numerabilem utriusque sexus multitudinem lignorum ac lapidum moles oppresserit. nunc autem, ut sic fortune lentescat improbitas, post multa et varia calamitatum genera turpissime tandem addiceris servituti.

Romuald of Salerno's account is briefer:

"At that time there was so strong an earthquake in Sicily that most of Syracuse castle collapsed. The city of Catania was also shaken to its foundations and collapsed in ruins. It also destroyed the church of S.Agata, killing the bishop and 45 monks. Lentini and Mohec [Modica] and many other fortified villages in Sicily were reduced to ruins in the earthquake. At Messina, too, the earthquake was very powerful and evident. All this happened in the year 1168 since the birth of Our Lord, in the second indiction, in the month of February, the day before the feast of St.Agatha [4 February 1169]".

Eo tempore in Sicilia terremotus factus est maximus, ita quod castrum Syracusanum pro maxima parte cecidit. Civitas etiam Catheniensium a fundamentis eversa ruit. Ecclesia etiam sanctae Agathe corruens, episcopum cum XLV monachis occidit. Lentinum etiam Mohec, et multa alia castra Sicilie pro terre motu corruerunt. Apud Messanam etiam maximus et manifestus terre motus fuit. Hoc autem factum est anno Dominice MCLXVIII incarnationis indictione II mense Februarii, in vigilia beate Agathe.

The *Annales Pisani* of Bernardo Maragone add a few more details and refer briefly to the tsunami at Messina:

"In the year of Our Lord 1169, incredible and amazing prodigies occurred in the island of Sicily, such as had not been seen since the time of Sodom and Gomorra. For the day before the Nones of February [4 February], the eve of the feast of St.Agatha, the city of Catania was shaken to its foundations by an earthquake, and neither man nor woman was left (alive) there. Lentini was suddenly enclosed between two mountains and part of the city of Syracuse was destroyed by the earthquake, and from the said city of Catania as far as Plassa [Piazza Armerina] eleven castles, fortified settlements and other villages were destroyed, along with many people who were caught by the earthquake in the fields or streets. And the lighthouse at Messina was left high and dry to a height of twenty *palmi* [c.5 m] from its foundations. And then, fortunately, it returned to its usual position".

A. D. MCLXVIII. A temporibus Sodome et Gomorre non fuerunt tam miranda et stupenda spectacula, qualia evenerunt in insula Sicilie. Pridie namque nonas Februarii, vigilia Sancte Agathe, Captania civitas a terremotu usque ad fundamenta subversa est, et non remansit ex ea nec masculus nec femina. Lintini inter duos montes repente clausa est, et quedam pars Saracose civitatis predicto terremotu periit, et a predicta Captania usque ad Plassa, XI inter civitates et castella et villas, cum multis hominibus in via et agro oppressis a iam dicto terremotu perierunt. Et Farum de Messana XX palmis funditus siccatum est. Postea vero cum fortuna in locum suum reversum est.

The chronicle wrongly attributed to William Godel gives a time for the earthquake which fits that found in the *Historia* of Ugo Falcando:

"In the year of Our Lord 1169 in Sicily, at dawn on the day preceding the Nones of February [4 February] before the first hour, the city of Catania was so devastated by an earthquake that it was as though it had not been inhabited for a hundred years. Amongst the approximately 15 thousand people who met a sudden death were the bishop, the clergy, the abbot of Mileto with 40 monks and all the populace. Other Sicilian castles and fortresses were also destroyed at the same time, and countless people were killed".

Anno Domini 1169 in Sicilia urbs Cathania ita diluculo ante horam primam terre motu subversa est 2 Nonas Februarii, acsi per centum annos non fuit habitata. Ubi et episcopus et clerus et abbas de Mileto cum 40 monachis et omnis populus, circa 15 milia hominum, morte repentina perierunt. Cetera etiam castra et munitiones per Siciliam hora eadem cum innumerabili populo everse sunt.

While we have reliable evidence for the effects of the tsunami at Messina, its effects at Catania are mentioned in one source only, namely the chronicle of Roger of Hoveden. Roger of Hoveden was an English chronicler who died at some time between 1202 and 1212. He records:

"In that same year [1164, but actually 1169], the day before the feast of St. Agatha Virgin and Martyr [4 February], there was so great an earthquake in the island of Sicily that it razed the city of Catania to the ground, and killed the bishop, the clergy and all the inhabitants of the city, that is to say 33,000 fighting men, as well as innumerable women and children. That same day, after the destruction of the city, the sea at Catania receded 30 *passuum stadia*, leaving large quantities of different fish on the shore. People from around the ruined city came to catch them, and while they were busy doing so, the sea flowed back, swept them away and dragged them down into its depths".

Eodem anno [1164], in vigilia Sanctae Agathae virginis et martyris, factus est terraemotus magnus in insula Siciliae, adeo quod Catanensium civitatem funditus subvertit, et episcopum et clerum et omnes illius civitatis habitatores occidit; viros siquidem belligeros numero triginta tria millia, exceptis mulieribus et parvulis, qui numerari non poterant. Eodem die post subversionem civitatis, mare Catanensium retraxit se per triginta passuum stadia, relicta in arena diversorum piscium copia, ad quam comprehendendam suburbani civitatis subversae concurrerunt, et dum intenderent capturae piscium, refluxit mare, et involvit eos, et traxit in profundum.

The verse composition set out below has been handed down to us by Matteo Selvaggio (1542), who thought it had been written at the time of the 1169 earthquake. The Latin text has been republished by Fasoli (1954). Although these lines add nothing to our knowledge of effects, they are of considerable importance in commemorating the impact of the earthquake on the people of Catania and conveying its dramatic quality. This text is perhaps the earliest medieval "lament" for the destruction of a city in an earthquake. "Whence does humankind justify its pride? They are ashes, their flesh is bait for worms, they are hay flower, male and female they are born and give birth, I grieve for Catania. How painful it is to express this sorrow. She was once illustrious, powerful and ancient in her people, her army and her clergy, In her riches of gold, beauty, valour and triumphs. Alas! This supreme dominion was destroyed by an earthquake. Death destroyed young people; men, brides and husbands died. Whence does humankind justify its pride? In an hour God destroyed Towers, adornments, dresses and all clothes. Whose heart would not burst with groans, tears and sighs? Such were the laments with which most people died.

Oh! What grief! More than forty-four monks died,
 and Father Giovanni, the pastor of the city, perished too,
 Thus perished the pontifical dignity, the light of the kingdom.
 May all have their rest, and may light, perpetual light, shine again
 for the pontifex and his monks, now and for evermore”.

*Unde superbit homo, cinis est, caro vermibus aescia
 Flos feni, genitor, genitus, genitrix, genitura,
 Cataniam doleo dolor est miserabile dictu.
 Claara potens, antiqua fuit, plebe, milite, clero.
 Divitiis, auro, specie, virtute, triumphis.
 Heu terremotu ruit / illa potentia rerum.
 Morte ruit iuvenis, moritur vir, sponsa, maritus.
 Unde superbit homo / deus una diruit hora.
 Turres, ornatus, vestes, cunctosque paratus.
 Quis gemitus, lachrymas, suspiria, corde teneret.
 In tanto gemitu / periit pars maxima gentis.
 Proh dolor / et monachi quadraginta quatuor / et plus
 Et periit pastor patriae / pater ipse Iohannes.
 Pontificalis honor, lux regni / sic periire.
 Sit requies cunctis luceat lux, ipsa perennis
 Pontifici monacisque suis et nunc et in evum.*

As we have pointed out, this information has to be treated with caution, for the details in Roger’s account as to the year and number of victims differ from what we find in other contemporary sources. There are certain aspects of Roger of Hoveden’s account, however, which suggest that his report of a tsunami at Catania is acceptable.

Greek sources

INSCRIPTIONS

There are two inscriptions in Greek, one from Catania and the other from monastery of Santi Pietro e Paolo d’Agrò (north-east of Taormina), dating respectively to 1171 and 1172, which record the (re)building and repair of church buildings. They may be directly related to the earthquake, but it is not specifically mentioned in either.

□ 1 – Catania: a marble plaque records the construction or reconstruction of the church of S.Stefano. The inscription was once on the architrave of the church door. When the building was demolished, the church and monastery of S.Benedetto were built in its place, and the inscription was preserved in the monastery, but it was destroyed during the Second World War. Here is the text of the inscription (CIG 4.8737; Mentzou-Meimari, 1977-79, p.124, no.234):

“This holy and most venerable church of the martyr and *protodiaconus* Stephen, pre-eminent in suffering, was built by the priest Arcadio. The first day of the month of April in the year 6679 [1 September 1170 – 31 August 1171]”.

Ἀνοικοδομήθει ὁ [πλάνσειπτος] θεῖος οὗτος ναὸς τοῦ προτάθλου καὶ προτοδίακόνου Στεφάνου ὑπὸ [τοῦ εὐλαβεστάτου Ἀρκαδίου ἱερέος μ(η)νὶ Ἀπριλίου α΄ ἔτους ςχθ’.

ΑΝΟΙΚΟΔΟΜΗΘΕΙ
 ΘΕΙΟΣ ΟΥΤΟΣ ΝΑΟΣ
 ΤΟΥ ΠΡΟΤΑΘΛΟΥ ΚΑΙ
 ΠΡΟΤΟΔΙΑΚΟΝΟΥ
 ΣΤΕΦΑΝΟΥ ΥΠΟ
 ΤΟΥ ΕΥΛΑΒΕΣΤΑΤΟΥ
 ΑΡΚΑΔΙΟΥ ΙΕΡΕΟΣ
 ΜΗΝΙ ΑΠΡΙΛΙΟΥ Α΄
 ΕΤΟΥΣ ςΧΘ΄

fig. 37 Reproduction of the lost inscription as copied in Amico (1740-46) and republished in the *Corpus Inscriptionum Graecarum* (vol.4/1 Curtius 1856; vol.4/2 Kirkhoff 1859).

This inscription has been used as a source for the 1169 earthquake by Guidoboni (2001), for her careful interpretation has corrected the dating mistake handed down for centuries by local historians. In fact, ever since Amico (1740-46) produced a drawing of it, its date has been given as 679 AD, which was thought to be the year when the church of S.Stefano was founded. But an examination of the corpora of sources has brought to light a quite different situation. The fact is that the most authoritative collection of Greek inscriptions, the *Corpus Inscriptionum Graecarum* (vol.4/1 Curtius 1856; vol.4/2 Kirkhoff 1859), provides the text of the inscription, and the date is 1 April in the year 6679 of the world — Byzantine style — corresponding to the year between 1 September 1170 and 31 August 1171. Strangely enough, the transcription in *CIG* uses and provides the drawing published by Amico (1740-46). A re-interpretation of this drawing (see fig. 37) has made it possible to agree completely with the *CIG* dating; which means that ever since the 18th century, the historiography of Catania has handed down an evident dating error.

□ 2 – Santi Pietro e Paolo d'Agrò (province of Messina): an inscription at the church of Ss.Pietro e Paolo, records restoration work at the monastery (*CIG* 4.8738; Mentzou-Meimari, 1977-79, p.125, no.240):

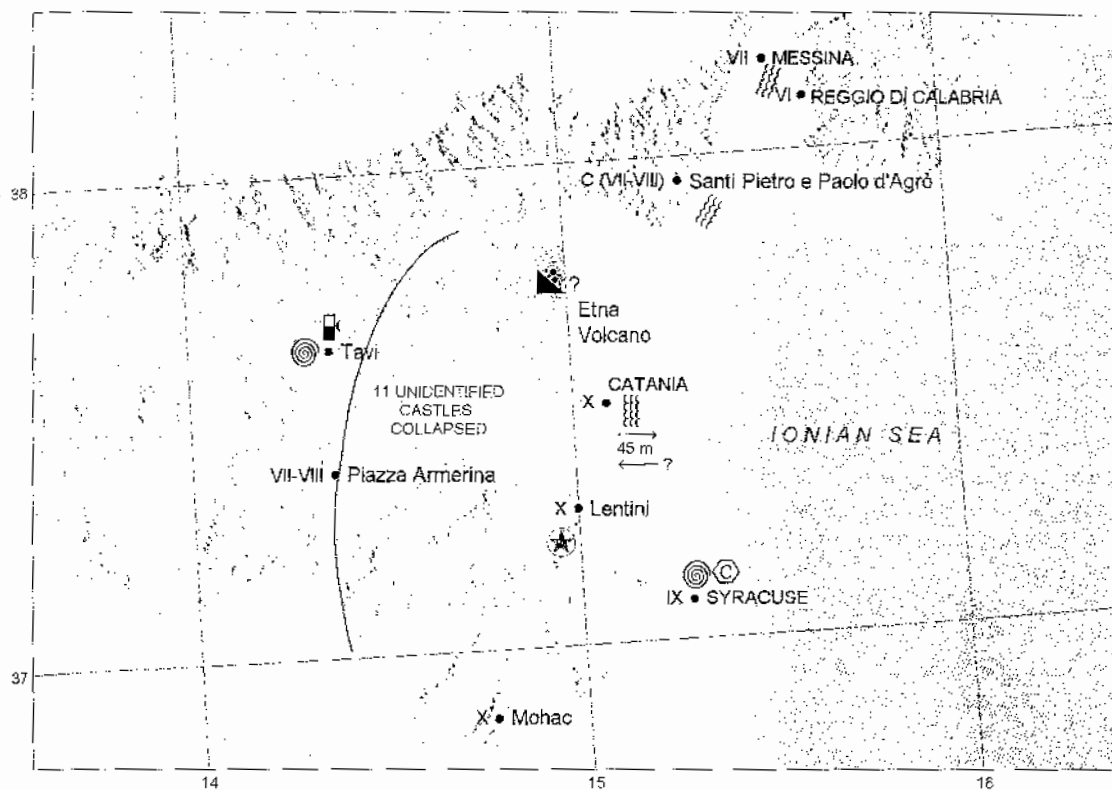
“This church of St.Peter and St.Paul the Apostles was restored thanks to willing contributions given to Theosteriktos, the *hegumenos* of Taormina. Remember him, o Lord; in the year 6680 [1 September 1171 – 31 August 1172]. Gerard the Frank was *protomagister*”.

Ἄνεκ(αι)νίσθ(η) ὁ να(ός) οὗτος τῶ(ν) ἁγίων ἀπο(στόλων) Πέ(τρο)υ καὶ Πα(ύλου) πρ(ὸς) Θε(ο)στηρίκ(του) καθ(η)γουμ(ένου) τοῦ Ταυρομενίτου ἀπὸ οἰκείων ἀναλωμά(των). Μνησθεῖη αὐ(τοῦ) κ(ύριος)· ἔτι ε(χ)π'. Ὁ προτομαίστορ Γεράρδος ὁ Φράγκος.

The *protomagister* was the architect of the church. The inscription can still be seen in the archivolt of the entrance portal to the church, which is considered to be one of the most important Basilian buildings in southern Italy (see fig. 38). These two inscriptions have never been taken into consideration in previous seismological literature.



fig. 38 Church of monastery of Ss.Pietro e Paolo d'Agrò (10 km ca. north of Taormina, in province of Messina), inscription in the archivolt of the entrance portal. Repair work carried out on the building between 1171 and 1172 is mentioned.



1169
February 4



fig. 39

NOTULA

A *Notula* in manuscript *Vaticanus Graecus* 1574, a codex which can be dated to about the 11th-12th century (published in Evangelatou-Notara 1982, p.209, no.428), records the earthquake in simple and brief terms, mistakenly dating it to 3 February: "An earthquake struck in the month of February, on the third day, in the second indiction, in the year 6677 [1 September 1168 – 31 August 1169], in the year when Catania collapsed. And it affected many other places".

(ἐγένετο ὁ σεισμός μὴ(νὶ) φε(βρουαρίῳ) εἰς τ(ὰς) γ' τῆς ἰνδ(ικτιῶνος) β' ἐν ἔτι ,εχοῦς' κατὰ τὸν χρόνον) του χαλάσματος πόλε(ως) Κατάνης καὶ ἑτερας χωρας πολλας.

Arabic source

An arabic source of about fifteen years later is to be found in the work of the Andalusian traveller Ibn Jubayr, who visited Sicily in December 1184. He reports some remarks by a Saracen eunuch at the court of William II:

"Once, when powerful earthquakes shook Sicily, this polytheist [William II] wandered around his palace in alarm, everywhere hearing only the cries of his women and pages, who were praying to Allah and his Prophet. When they saw the king, they were all overcome with confusion, but he calmed them by saying: 'Let each one of you invoke the Being he adores and in whom he believes'".

انه كان في هذه الجزيرة زلازل مرجفة ذعر لها هذا المشرك فكان يتطلع في قصره فلا يسمع الا ذاكراً لله و لرسوله من نساءه و فتياته و ربما لحفتهم دهشة عند رؤيته فكان يقول لهم ليذكر كل احد منكم معبوده و من يدين به تسكيننا لهم

Ibn Jubayr does not give the date of the earthquake or the place where it occurred. Amari (1880, III/II, p.542) thought it was the earthquake of 1169, and Johns (1989, p.308) thought the palace mentioned in the text was the one at Messina; but we do not

know where the royal court was resident at the time. Agnello (1996, p.107) took up a hypothesis put forward by Boschi *et al.* (1993, p.17), suggesting that Ibn Jubayr's text was really referring to the earthquake which struck the Crati valley (in Calabria) on 24 May 1184, a few months before Ibn Jubayr reached Sicily. However, since Ibn Jubayr's narrative says nothing of the earthquake's time or place, the only certain parameter we have is the *terminus ante quem* of December 1184, so any correlation with the earthquake of 1169 is simply hypothetical.

▲ 1169 02 04 07:00 UT ☉ = 37 13 14 57 Io = X Me = 6.3 Sites: 8 EE: 3 Ts									
localities	lat.	long.	I	localities	lat.	long.	I		
Catania	37 30	15 05	X Ts	SS.Pietro e P. d'A.	37 55	15 20	C (VII-VIII)		
Lentini	37 17	15 00	X	Messina	38 11	15 33		VII Ts	
Modica	36 51	14 46	X	Reggio di Calabria	38 06	15 39		VI	
Syracuse	37 05	15 17	IX EE	Tavi	37 38	14 22		EE	
Piazza Armerina	37 23	14 22	VII-VIII	Etna Volcano	37 45	15 11			EE

(088) 1170 May 9 Ceccano [Latium, central Italy]

- source *Ann. Ceccan.*, p.286
- historiography Tovazzi (ed. 1986); Di Meo (1795); Toubert (1973); Gasparri (1992)
- catalogues d. Bonito (1691); Perrey (1848); Mallet (1853); Capocci (1861-63); Mercalli (1883); Baratta (1901); Milne (1911); Galli (1906); *Boschi *et al.* (1997, 2000)
- catalogues p. Giorgetti and Iaccarino (1971); Carrozzo *et al.* (1973); Dell'Olio and Molin [1980]; Postpischl (1985); CPTI (1999)

This earthquake is recorded in a single source, namely the *Annales Ceccanenses* (or *Chronicon Fossae-novae*), and caused damage at Ceccano, a locality in the present-day province of Frosinone. The text reads:

"1170 [...] On the seventh day before the Ides of March [9 March] there was such a violent earthquake that it destroyed most of the walls of the town [Ceccano] and caused the bells to ring of their own accord. On 10 May, part of Ripa caught fire".

1170 [...] 7 Idus Martii tam vehemens fuit terrae motus, quod plerosque muros civitatis destruxit, quod etiam per se sonaverunt campanae. Decimo die stante mense Madii pars Ripae arsit.

The *Annales Ceccanenses* is preserved at the abbey of Fossanova, and concerns the town of Ceccano. It was written in the late 12th and early 13th century by an unidentified author who lived at Ceccano or in the neighbourhood. The chronicle was first published by Ughelli (1722), then by Muratori (1725) and finally by Pertz (1866) in the *Monumenta Germaniae Historica*, under the title *Annales Ceccanenses*. This last edition, unlike the others, dates the earthquake to 9 March instead of 9 May. In so doing, it is probably following the exact reading of the codex, but the context in which the earthquake is mentioned suggests that it should really be dated to May. Thus the item preceding the earthquake is dated to 7 May (*5 Idus Maii*).

The two earlier editions of the chronicle have another variant from Pertz's text: "the bells rang of their own accord for ten days" (*per se sonaverunt campanae decem diebus*), as opposed to *Decimo die stante mense Madii*. That is why Baratta (1901), who used Muratori's edition, supposed that the shocks lasted for ten days.

Ughelli (1722) attributed the chronicle to Giovanni di Ceccano, but Muratori (1725) rejected this attribution, feeling it safer to publish the work as anonymous. Pertz (1866) thought it might have been written by Benedetto, a notary employed by count Giovanni di Ceccano, the chief local lay authority at the end of the 12th century. This

identification was accepted by Toubert (1973) in his study of institutional, economic and territorial structures in medieval Latium, and was taken up by Gasparri (1992), who dealt with the counts of Ceccano in a wider-ranging study of chivalry in Italy. Toubert took the *Annales Ceccanenses* to be a work belonging to the family chronicle genre, although in fact it is almost exclusively devoted to an account of the main events in the life of count Giovanni di Ceccano, who died in 1224 or 1227. Central to the account is the attempt by the counts and other local lords to resist the penetration of the region by German forces under the Emperor Henry VI. The attribution of the chronicle to the count's notary, Benedetto, lends authority to the report of an earthquake, even though it is neither confirmed nor elaborated upon by any other source.

There are no other published or unpublished sources available for this area and this earthquake. In fact, the abbey of Fossanova, which was the only monastic institution of any significance in the area, no longer has any records for the period in question. Furthermore, this region, which was subject to papal temporal power at the time of the earthquake, was a marginal area without important towns, situated on the frontiers of the Kingdom of Sicily and at the edge of the vast expanse of the Pontine marshes. These factors explain why records and chronicles for the area have not been preserved, and hence why historical sources are silent about the area. The report of the earthquake in the *Annales Ceccanenses* is therefore unique. It records damage in one locality only, to which it is extremely difficult to add from other sources, even negative ones, because of the lack of towns capable of producing and preserving written records.

▲ 1170 05 09

localities	lat.	long.	I
Ceccano	41 34	13 20	VIII

< 089 > 1170 June 29 Eastern Syria and Lebanon

sources 1 Documents

Amalric I (king), Letter to the Louis VII (king of France), July-August 1170, in Mayer (1989, p.484); Amalric I (king), Grant, 1170, in Delaville Le Roulx (1894-1906, I, no.411, pp.284-6); Alexander III (pope), Appeal, Tuscolo, 8 December 1170, in Hiestand (1985, no.198, pp.393-4)

Annals and chronicles

Will. Tyre, *Chron.*, pp.934-6; Marag. Bern., *Ann.*, pp.49-50; *Ann. Vizef.*, pp.228-9; Rob. Torig., *Chron.*, p.519; *Ann. Floreff.*, p.625; *Chron. quod dicitur* [W.Godel], in Rob. Aux., *Chron.*, p.240; *Ann. Colon. max.*, pp.120-1; *Ann. Gastin.*; *Ann. Magdebur.*, p.193; *Ann. Admunt.*, p.584; Mich. Syr., 19.6, *Chron.*, IV, pp.695-6; Mich. Syr. Arm., *Chron.*, pp.464-6; Ibn al-Athir, *al-Ta'rikh*, p.145; Ibn al-Athir, *al-Kamil*, XI, pp.254-5; Sibit ibn al-Jawzi, *Mir'at*, VIII, pp.174-5; Benjamin Tud., *Itin.*; Neoph. Enkl., in Delehaye (1907), pp.211-2; *Chron. min. Arm.*, I.3, p.76; II.24, p.502

sources 2

Ann. Pegav., p.260; *Chron. univ. Metten.*, p.518; Vinc. Beauv., *Spec. hist.*, p.1191a; Martin Tropp., *Chron.*, p.437; Martin Tropp., *Liber*, II, p.450; *Flores temp.*, p.239; Will. Nang., *Chron.*; Riccob. Ferr., *Pomar.*, cols.125, 174; Riccob. Ferr., *Compil.*, col.240; Tol. Lucca, *Ann.*, pp.66-7; Tol. Lucca, *Hist.*, col.1108; Pipino, *Chron.*, col.627; Dandolo, *Chron.*, p.249; Bezanis, *Cron.*, p.28; Palmieri Matteo, *Liber*, p.97; *Cron. Ramp.*, II, pp.32-3, 43; *Est. de Eracles*, III, pp.971-3; *Chron. Terre Sainte*, p.7; *Ann. Terre Sainte*, p.432; *Cron. Varign.*, II, p.4; Sanudo, *Le vite*, p.272; Amadi, *Chron.*; *Chron. ad 1234*, p.169; Bar Hebr., *Chron.*, p.339; Ibn al-Adim, *Zubdat*, II, p.330; Abu Shama, *al-Rawdatayn*, I, p.184; Ibn Wasil, *Mufarraj*, I, p.185; Ibn Shaddad, *al-Nawadir*, p.43; Ibn Qadi Shuhba, *al-Kawakib*, p.189

Historiography	Röhricht (1898); Delaville Le Roulx (1904); King (1931); Hakobyan (1956); Elisséeff (1967); Ducellier (1980); Mayer (1989); Hild and Hellenkemper (1990); Molin (2001)
Literature	Taher (1979); Poirier <i>et al.</i> (1980); Ambraseys and Barazangi (1989); Ambraseys and Jackson (1998); Guidoboni <i>et al.</i> (2004)
catalogues d.	Manetti [1457]; Lycosthenes (1557); Bonito (1691); Seyfart (1756); von Hoff (1840); Perrey (1850); Mallet (1853); Sieberg (1932a); Grumel (1958); Step'anyan (1964); *Ben-Menahem (1979, 1991); Amiran <i>et al.</i> (1994); *Ambraseys <i>et al.</i> (1994)
catalogues p.	Ergin <i>et al.</i> (1967); Poirier and Taher (1980); al-Hakeem (1988); Bektur and Alpay (1988); Khair <i>et al.</i> (2000)

History of the earthquake's interpretation

The earthquake of 29 June 1170 is one of the largest seismic events ever to occur along the northern part of the Dead Sea Transform Fault System (DSTFS), the c.1000-km-long western boundary of the Arabian plate.

The importance of the earthquake on 29 June 1170 has left an indelible mark upon the scholarly and scientific seismological tradition. The first references to it can in fact be found in the earliest Mediterranean area catalogue, namely that of the humanist Giannozzo Manetti [1457]. In the scientific seismological tradition this earthquake has had a variety of interpretations, even contradictory ones, which have persisted until now.

The correct dating of the shock on 29 June 1170 already appears — though not without some uncertainty — in the main descriptive catalogues of the 19th century. However, the persistence of discrepancies and uncertainties among the various catalogue authors has led to a “multiplication” of the event and the generation of shocks for which there was no evidence in the sources. These flawed data have then been transferred unaltered into some second-generation catalogues as well — to modern parametric catalogues, that is to say. Thus, a survey of the parametric catalogues of the last 25 years provides an overview of the different interpretations which still survive. In Ben-Menahem's catalogue (1979), which is subdivided into geographical and tectonic areas, the 1170 earthquake is correctly dated to 29 June and is placed in the section devoted to the northern end of Levant Fault System (p.278, event 14). The parameters reported are those of a high energy earthquake ($M_s = 7.9$), and the description of effects is limited to the regions lying between the Lebanon and south-western Syria, though the damage zone is extended to Israel and Caesarea. In a second work, Ben-Menahem (1991, pp.20, 203) slightly downsizes the parameters of the event ($M_L = 7.5$ and $I_0 = X-XI$) and gives the epicentral coordinates recorded by Ambraseys and Barazangi (1989), thus shifting the area of greatest effects further north. The information relating to the effects remains, however, substantially the same as for the previous catalogue, with the addition of information about the destruction of Antioch and the damage and victims in the Orontes Valley. Poirier and Taher (1980, p.2192) correctly date the events to 12 *Shawwal* of the year 565 of the Hegira, but give 30 June instead of 29 June 1170. Amongst the worst-hit locations, only Aleppo, Antioch and Damascus are listed. Another work of the same year, Poirier *et al.* (1980), provides more detail, but the damage area cannot be distinguished from the felt area.

Al-Hakcem (1988, p.22, event 185) also mistakenly dates the earthquake to 30 June 1170 and estimates its epicentral intensity at grade IX MM. A further three 12th century events, also recorded in this catalogue, are given without the month or day, and could be duplications of the earthquake of 29 June 1170, perhaps inherited from some 19th century catalogues.

Bektur and Alpay (1988, p.41, event 88) record the earthquake with the correct date and with $I_0 = IX$ MSK-64. According to them, the shock caused many thousands of victims and was felt in Cyprus. A further three earthquakes are also recorded in this cat-

alogue, with misdatings probably resulting from transcription errors in previously used texts.

In Amiran *et al.* (1994, p.270) the dates are largely gleaned from previous catalogues (including that of Ben-Menahem, 1979) and Islamic sources. The earthquake is correctly dated to 29 June 1170 and, according to the picture provided by the authors, was devastating in Syria, causing damage in Tyre and hundreds of deaths in Palestine. The main shock parameters (magnitude and intensity) remain uncertain, along with the most seriously affected locations. The information provided in the catalogue of Ambraseys *et al.* (1994, p.36 and p.101) is very limited because the event falls outside its scope. As to the effects of the 1170 earthquake in the Egyptian area, already recorded by Ben-Menahem (1979, 1991) and before that by Mallet (1853) and Sieberg (1932a), Ambraseys *et al.* (1994) express some doubts because the local sources for that period have been lost.

In the study by Khair *et al.* (2000) on the seismic zonation of the Dead Sea fault area, all the known strong ($M_s \geq 5.9$) earthquakes that occurred along the DSTFS during the past four millennia are listed. As far as we know, this list is the latest available catalogue. The data contained in it are, however, based only on previous works and other historical catalogues, i.e. not on original sources. In their proposed seismic zonation scheme, the 1170 earthquake (p.68) is located in the Karasu seismogenic zone, i.e. the northernmost portion of the DSTFS, in the region straddling the present-day Syro-Turkish border. The M_L (7.5) and epicentre ($35.9^\circ N$, $36.4^\circ E$) values are taken from Ben-Menahem (1991) and Ambraseys and Barazangi (1989).

The variety of interpretations substantially derives from the nature of the texts providing the basic data used by the various authors: these are mostly scientific works and historical catalogues of the 19th and 20th centuries, from which we may have inherited errors as well as omissions. Exceptions to this are Poirier and Taher (1980) and Al-Hakeem (1988), who used primary sources, but solely from the Arabic tradition. This group of sources, although very important and authoritative (see below), constitutes

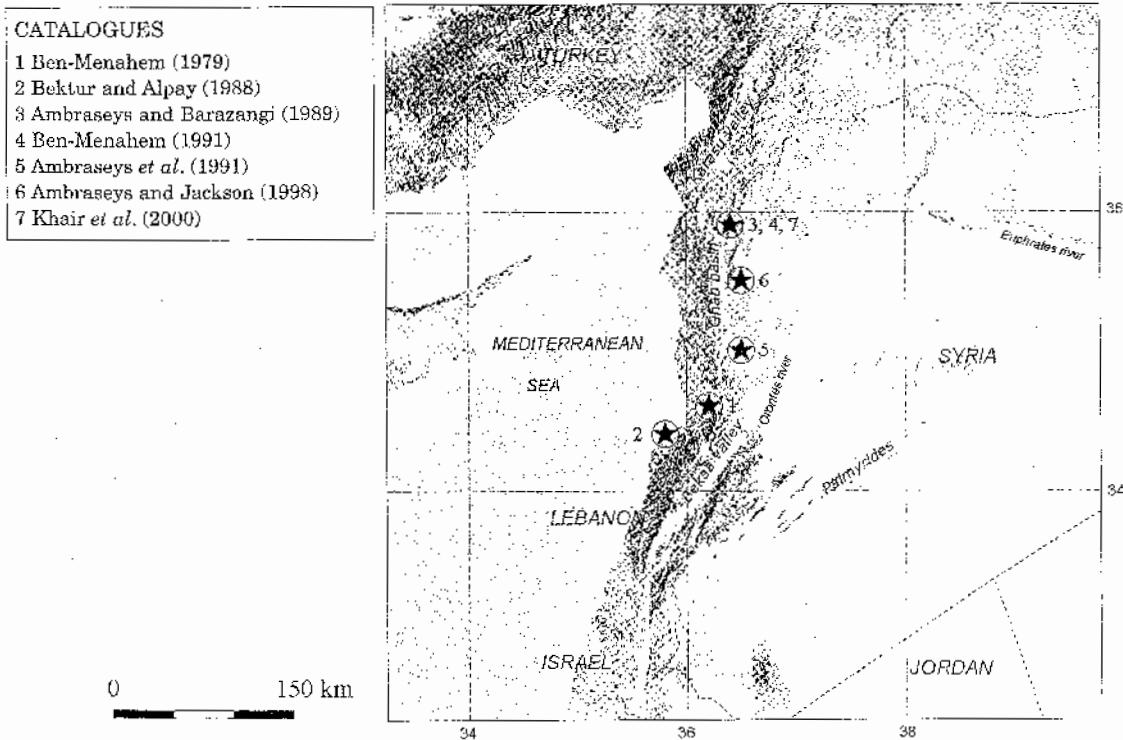


fig. 40 Epicentres from catalogues published between 1979 and 2000 (from Guidoboni *et al.* 2004).

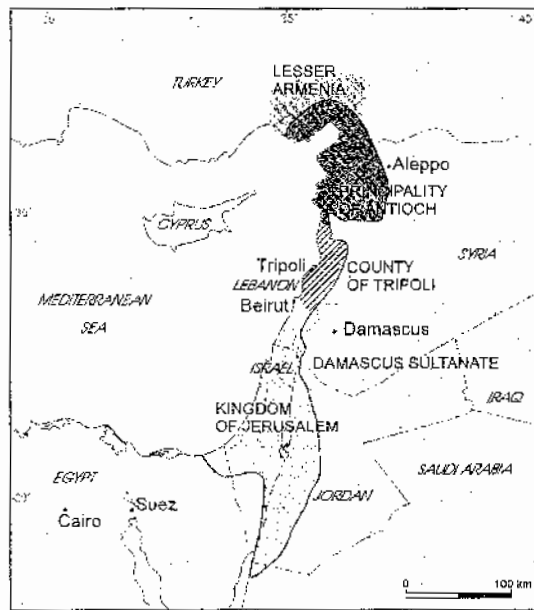


fig. 41 Western Syria and the Lebanon in the second half of the 12th century. The territory was broken up into three Latin states and an Armenian area. The rest of the territory was under Muslim domination (from Guidoboni *et al.* 2004).

only one of the three main independent cultural-linguistic traditions relevant to the 1170 earthquake (Latin, Syriac and Arabic). The data used by Poirier and Taher (1980) are based on the accounts of two historians: Sibte ibn al-Jawzi (but erroneously referred to as Ibn al-Jawzi, who was in fact his uncle), and Ibn al-Athir (1160 – 1231). The latter is one of the most authoritative Arabic sources for this earthquake, although the picture he provides is incomplete.

Since the historical sources used are direct and authoritative but belong to a single cultural and linguistic area, it is clear that the reconstruction of the event is necessarily limited, and that, at best, they can provide only a partial interpretation.

Worthy of mention among more recent studies is that of Ambraseys and Jackson (1998), in which there is a list of historical and recent Eastern Mediterranean earthquakes associated with surface fault breaks. On the basis of a previous catalogue by Ambraseys and some vaguely defined “unpublished data”, the event of 29 June 1170 is listed (p.392, event 32) as a large shock ($7.0 \leq M_s < 7.8$), located in the Afamiyah (ancient Apamea, now Qalat al Madiq) area, in the Orontes Valley (western Syria), with the epicentre at 35.5°N and 36.5°E . Our survey of the seismological literature clearly shows that the earthquake lacks an agreed and reliable interpretation. Figure 40 illustrates the different locations of the epicentre as indicated by the various authors in the catalogues and studies cited. A piece of research on this specific subject (Guidoboni *et al.* 2004) has revealed a more complex and better documented situation, and hence allowed an assessment of 16 additional localities. It is within this context that the two-earthquake hypothesis has been formulated.

Chronology: one or more events?

According to contemporary sources, the earthquake occurred at about 06:00 local time, that is to say, about 03:45 UT. The detailed account by William of Tyre explicitly records it “around the first hour of the day”, in terms of the canonical hours. All the texts analysed give 29 June 1170 as the date of the main shock. The Latin sources date it to the third day before the Calends of July or the feast of St. Peter and Paul, in the seventh year of the reign of Amalric I (King of Jerusalem from 1163 to 1174). The Syriac sources give 29 Haziran in the year 1481 (of the Greeks); the Arabic sources give 12 *Shawwal* in the year 565 of the Hegira. These different styles of dating all

correspond to 29 June 1170. In spite of this agreement, it is legitimate to ask whether there was in fact one or more than one earthquake. Leaving aside the geological features of the area, it is the extent of the effects area that suggests the answer. From this specific standpoint we have analysed all the contemporary sources, attempting to highlight any element that may be help to provide an answer. We have focused on the terms with which the selected contemporary sources defined the chronology of the event, seeing whether the terms used are singular or plural and how the date is stated. Although it is hard to be quite sure, we think that only William of Tyre contains anything which would allow us to suppose that there were two events: one generically dated to June 1170, the other more specifically to 29 June 1170. While remaining critically cautious, we can observe in his text a narrative sequence supporting this hypothesis. Indeed, in the first part of the text he says that in June 1170 an earthquake affected seven cities very badly (in order of mention: Antioch, Gabala, Laodicea, Aleppo, Schayzar, Hama, Emesa (Hims)). They are located north of Tripoli and correspond to the historical region that the author calls Coelesyria. Then on 29 June Tripoli and Tyre were struck (the area is called Phoenicia by the author, and corresponds to present-day Lebanon).

We could not find any other evidence suggesting two events, and the other contemporary sources agree in identifying 29 June as a single event. Although the two-event interpretation has a sound scientific basis, we have to point out that the historical sources of the period had cognitive limitations. For in the 12th century world-view, systematic analysis was not a key element: at that period the availability of day-to-day data on the shocks that were felt was not the only variable. Taking account of the particular cultural picture which the contemporary sources provide, we have formulated two hypotheses:

- 1) that the identified effects can be interpreted as those of a single earthquake; it is on this basis that the parameters have been interpreted (see fig. 42 a and b);
- 2) that there were two strong earthquakes; for this hypothesis the parameters cannot be calculated because the two areas are not easily differentiated and so there may well be zones with overlapping effects (see fig. 43).

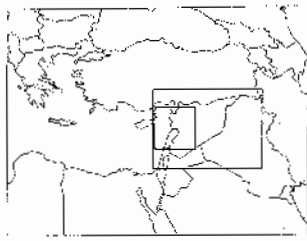
The historical context

Our research aim has been to paint a broad picture of the earthquake's effects, beginning with the territorial divisions in medieval Syria, which included what is now the Lebanon and Israel and was then divided into three Latin states. These territories were formed after the military conquest by the Crusaders. From north to south these territories were: the Principality of Antioch, the County of Tripoli, and the Kingdom of Jerusalem; to the north was the Kingdom of Lesser Armenia. The rest of the territory was under Muslim domination (see map in fig. 41).

The production of sources for the 1170 earthquake at the time or immediately afterwards was thus fostered by the particular historical period in which the earthquake took place, that is to say, between the second (1147-1149) and the third Crusade (1189-1192). These circumstances explain why such an earthquake is documented by sources in different languages which complement one another from the point of view of the territories struck. This evident fact, however, escaped the notice of the authors cited above, who drew on the tradition of the Arabic texts.

The earthquake's propagation zone was enormous: it struck Al-Mawsil, Sinjar, Nisibin, Al-Ruha, Harran, Ar-Raqqah, and Mardin, reaching as far as Baghdad, Basra and other towns in Iraq; but the sources do not specify in detail the effects in these localities. The earthquake was strongly felt at the monastery of Mar Hananya, but the building did not suffer any damage. There was no damage in Palestine.

The earthquakes lasted for three or four months, or perhaps longer. There were times when three or four or even more shocks were felt by day or night.



hypothesis 1

1170
June 29

0 150 km

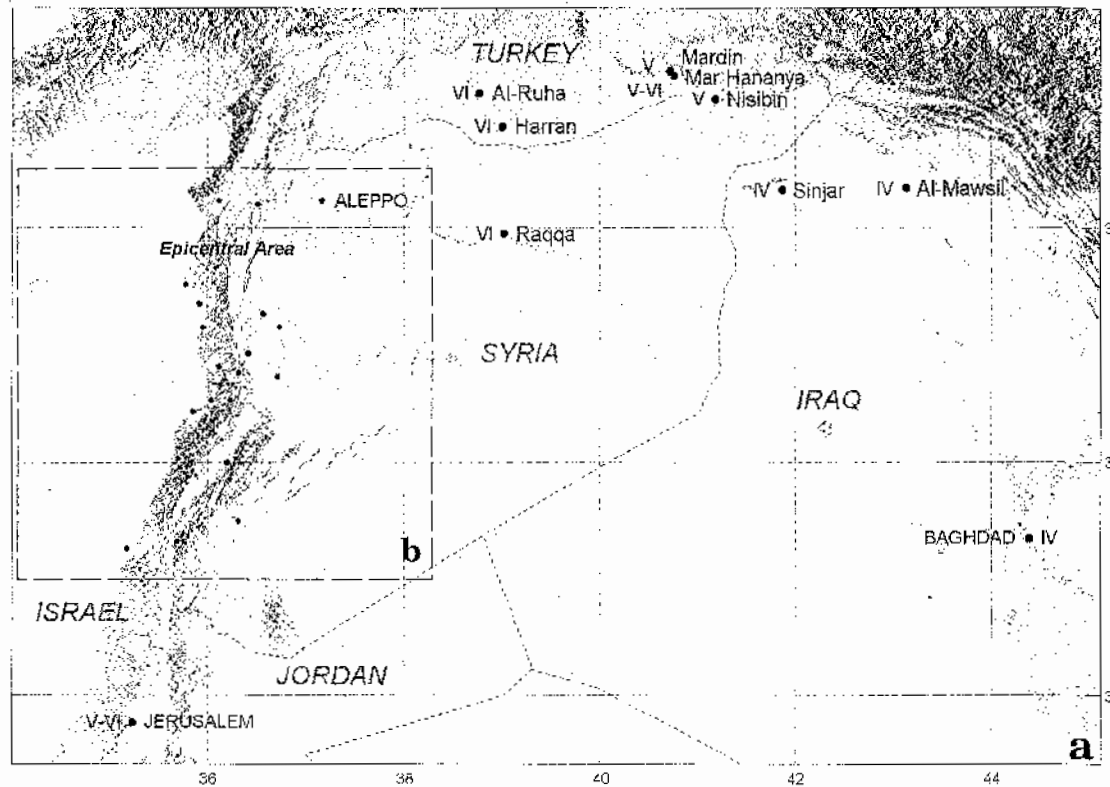


fig. 42a (elaborated after Guidoboni *et al.* 2004).

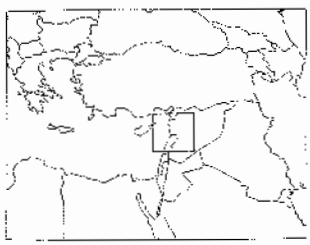
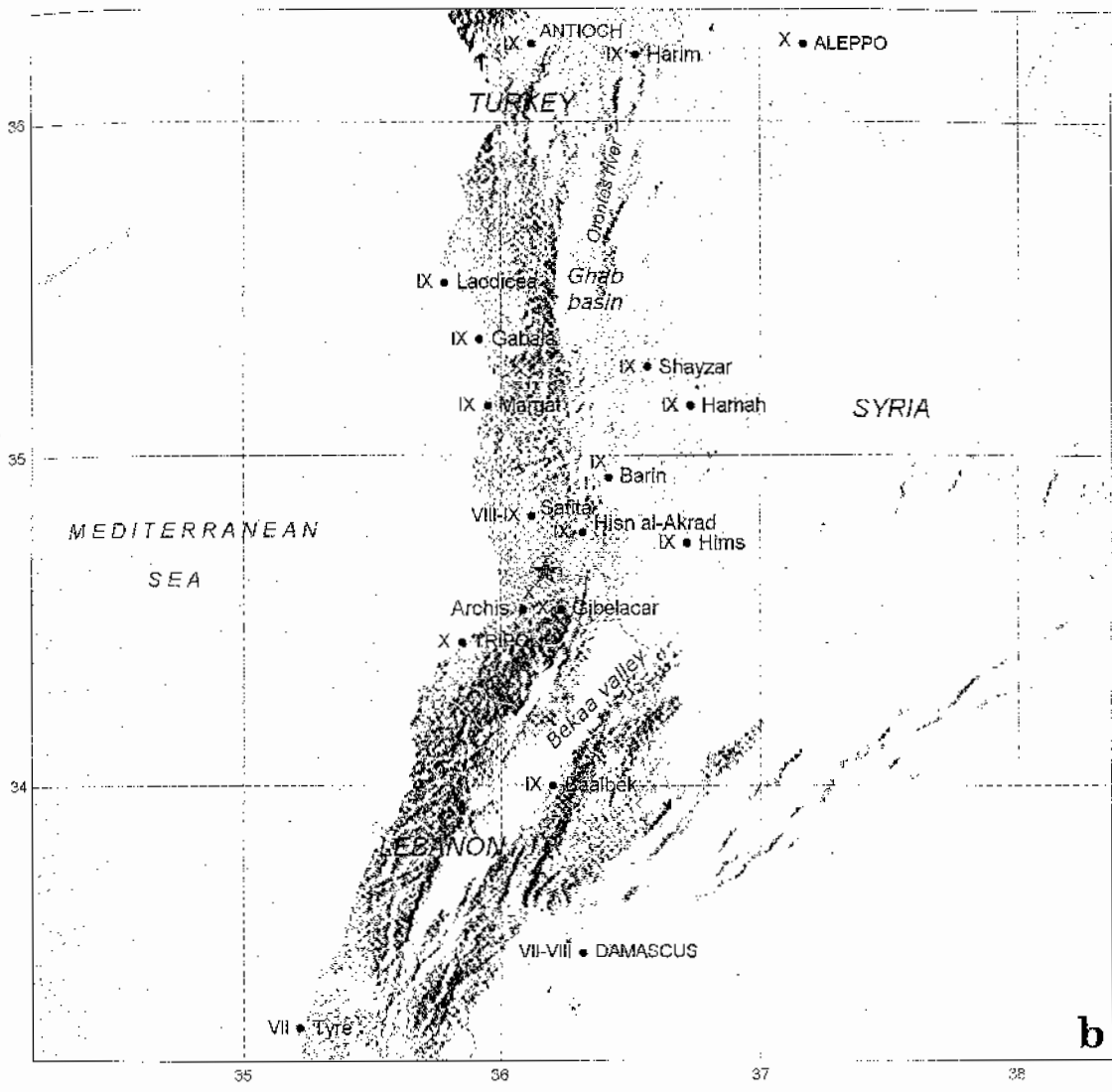
Effects of the earthquake

By selecting the data according to the importance and authoritativeness of the various authors, it has been possible to outline a general picture of the damage and felt effects of this large earthquake. It is important to note, however, that this reconstruction is not without its omissions and problems, due to the type of text to be interpreted, the availability of the sources, as well as the difficulty of identifying toponyms: indeed, in the sources the same place is given different names in different languages. In spite of the difficulties and constraints, mainly resulting from the historical time that separates us from the event in question, our analysis has highlighted previously unknown effects at 16 locations.

The whole territory belonging to the cities of Antioch to the north and Tripoli to the south, both along the coast of the Mediterranean Sea, and in the hinterland, along the Bekaa Valley and the River Orontes up to the area of Aleppo was seriously affected, with widespread destruction.

On the coast of modern Lebanon, in what used to be the County of Tripoli (now Tarabulus), the fortified settlements of Archis (also called 'Arqa, present-day Mathanat ad Dulbah), Gibelacar (modern Akkar al Atiqah), and even the city of Tripoli itself were completely destroyed. The latter suffered such extensive damage that most of the inhabitants were killed. The contemporary sources agree in describing the state of devastation at Tripoli: William of Tyre called it "untidy piles of stones"; Amalric I, in his letter to Louis VII of France, described it as being destroyed "down to its very foundations", with the death of nearly all the people living there.

In Amalric's letter, the fortresses of Archis and Gibelacar are also said to have been "destroyed from their very foundations". Apart from the particular aims of the letter (mentioned above), we think these dramatic expressions may also be idioms of the time. Medieval Latin sources in fact use such terms to indicate the "complete



hypothesis 1
1170
June 29

fig. 42b (elaborated after Guidoboni *et al.* 2004).

functional loss” of a building, rather than its total destruction. In any case, we believe that such an expression, even if used in a contingent and perhaps somewhat generic manner, could only refer to very serious and extensive damage. At Baalbek, in the Bekaa Valley in present-day northern Lebanon, the city walls and citadel collapsed.

Farther north, in the territory of the County of Tripoli, there was serious damage to the castle of Margat (present-day al-Marqab), and Crak des Chevaliers (now Qalat al-Hisn). The latter was an important fortified castle, an imposing structure of dark basalt built on a spur of Gebel Alawi, about 750 m above sea-level. It dominated the road to the Crusader port of Valénie/Banyas, and thus controlled the coastal road which ran north from Tripoli to the Principality of Antioch (Molin 2001). This fortification is referred to in the Muslim sources as Hisn al-Akrad, now Qalat al-Hisn. The sources say that it suffered the “complete” collapse of the walls. The texts describe it as “sinking beneath the waves of the earthquake” (Abu Shama), and it was written of the walls — perhaps without exaggeration — “there remained no trace” (Sibt Ibn al-Jawzi). It is understandable that the Muslim sources perhaps exaggerated such devastation, for the castle was an enemy fortification. However, the dam-

age was certainly extensive. According to Molin (2001), who also assessed it from an archaeological standpoint, Crak des Chevaliers underwent profound transformations following the destruction caused by the various earthquakes, including that of 1170, which struck it at the end of the 12th and the beginning of the 13th century. The famous and imposing fortress rises high even today, so well preserved as to be considered the greatest medieval fortress in the world. However, it is the result of radical modifications and reconstructions carried out from the last decades of the 12th century to around 1220 (see fig. 44). From these we can understand the complexity and remarkable size of the fortress.

There was further destruction at Ba'rin (known by the Crusaders as Montferrand or Mons Ferrandus), where the city walls collapsed, as well as at the Frankish-Crusader citadel of Safita (also known by its Frankish name of Chastel Blanc), situated between Crak des Chevaliers and the Mediterranean coast. The historian Abu Shama (the only one who cites this location) records Safita as having "subsided": this is another term used by the narrators of the times, often to indicate landslides and the subsidence or collapse of buildings.

In the hinterland territory around the River Orontes, then controlled by the Muslims, the earthquake caused serious damage to the walls and citadels of Hims (ancient Emesa), Hamat (Hamah) and Shayzar. Even though the last of these is in a poor state of preservation, it still rises from a rocky spur overlooking the left bank of the Orontes.

Along the Mediterranean coast between Tripoli and Antioch there was destruction in the territories of the states controlled by the Crusaders. In the Principality of Antioch, the ports of Laodicea (present-day Al-Ladhiqiya) and nearby Gabala (modern Jablah) were struck. According to Michael the Syrian, the latter collapsed entirely. Further north, the earthquake caused extensive destruction in Antioch and Aleppo, two great cities which were enemies at that time.

Antioch (Antakya) was an important city of ancient origins (founded in 301 BC by Seleucus I), and the capital of the Frankish Principality of Antioch. The fortified city rose along the slopes of Mount Silpius. Its walls, dating back to the early Byzantine period (they were probably built after the violent earthquake of 526 AD, see Guidoboni *et al.* 1994), were 18 km long, and formed a triangle at the top of which a tenth-century citadel was built on a mountain peak to defend the whole city (Cuneo 1986; Molin 2001). The earthquake in Antioch must have been highly destructive if it is true that, as the sources report, it caused the collapse of the towers and walls, famous at the time for their strength. It is nonetheless true that to say "the walls had been destroyed" was a sort of literary topos, intended to convey that there were gaps in the walls (owing to collapses of a greater or lesser extent) and that their defensive function could no longer be guaranteed. Thus they no longer existed as a fortification.

Furthermore, many buildings and churches in Antioch also collapsed, in particular the cathedral of St. Peter; the collapse of this church was considered by many Catholic Christians in a highly ideological light and was contrasted with the "resistance" of the three churches of the Mother of God, St. George and St. Barsauma. What had happened? According to the sources (Michael the Syrian, Ibn al-Athir and William of Tyre), the Franks perceived it as divine intervention because the Orthodox Christian patriarch was officiating at mass with the clergy when the earthquake occurred. Fifty people died altogether and Antioch is described as being half-destroyed.

Aleppo (Alab) lay to the east of Antioch. Along with Damascus and Cairo, it was one of the main political, economic and cultural centres of the Mediterranean Muslim world. It was an important and highly populated city, with a fortified citadel, high and imposing defensive walls, and large mosques. From the descriptions in the sources, the severity of effects in the city become clear. The historian Ibn al-Athir recalls that in Aleppo "the effects of the earthquake could not stand comparison with those of the

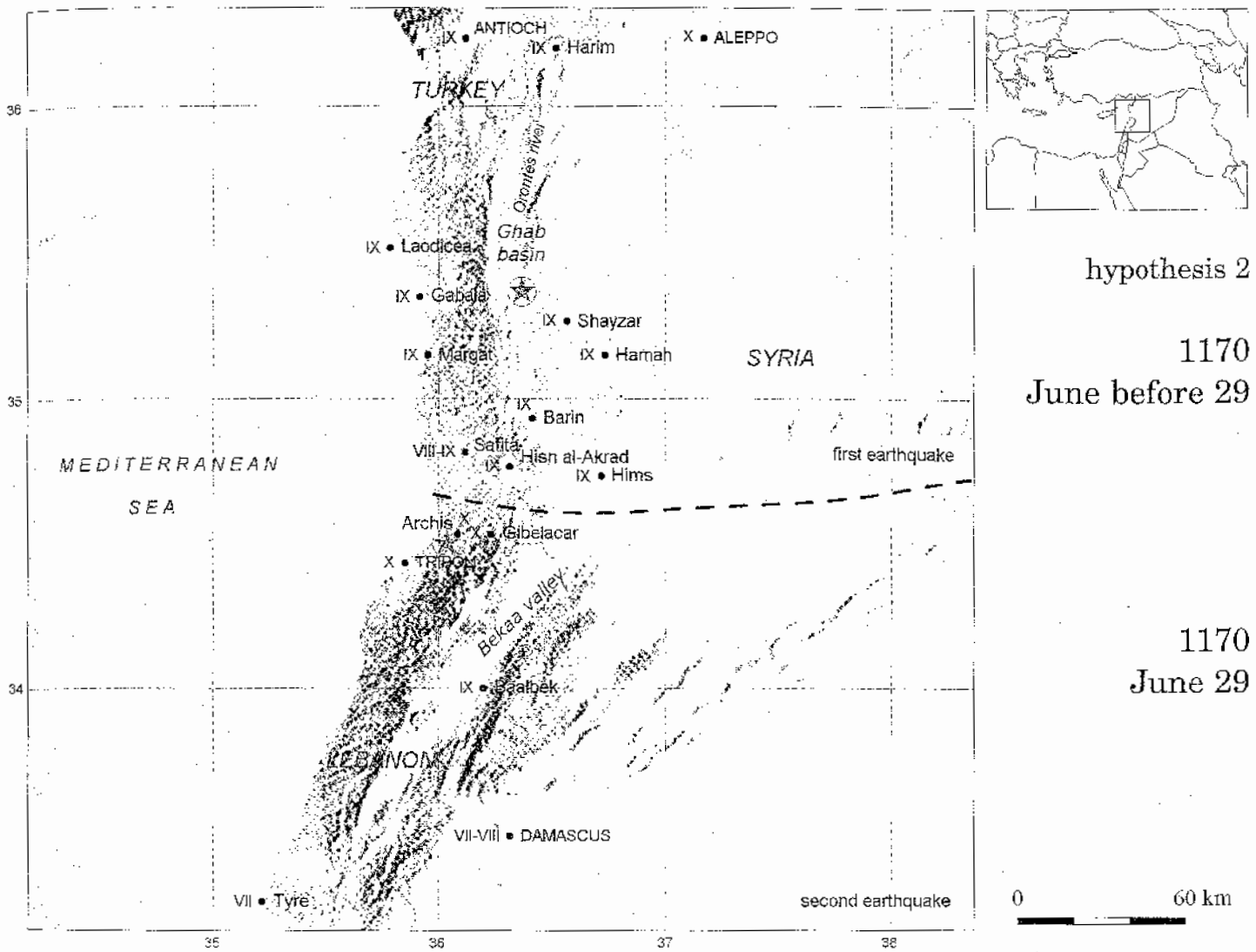


fig. 43 Earthquakes on June 1170: hypothesis 2): probable areas of two different seismic events separated by the dashed black line, according to the interpretation that we have given to the text by William of Tyre, coeval Latin source (elaborated after Guidoboni *et al.* 2004).

other cities”, leaving us to suppose that effects were perhaps more serious than at Antioch, Damascus or Tyre; he then states that “the survivors were still prey to panic, which prevented them from returning to the places that were unscathed”. The presence of “unscathed” places suggests differentiated effects, as always happens in large urban areas. According to the historian Sibit Ibn al-Jawzi, the citadel that dominated Aleppo only partially collapsed; he then adds, as confirmation of the severity of the effects, that there was great damage to the city and that 80,000 of its inhabitants perished.

In the Syriac sources there are expressions that may appear to be contradictory, but it should be borne in mind that the earthquake was a sign of divine wrath. Source narratives might therefore stress that the damage was limited, particularly in regard to powerfully symbolic buildings such as the churches, especially in that scenario of military and religious conflict. Michael the Syrian, the most important of the Syriac sources, refers to Aleppo in two different passages in the following terms: i) “the whole city became a waste hill” and “the whole town fell down”; ii) the Catholic church of the

hypothesis 2

1170
June before 29

1170
June 29

city remained intact and "not a single stone [of the church] fell down". We believe that the effects of the earthquake at Aleppo were very serious and destructive, presumably not lower than grade X MCS, with some areas of the city perhaps less damaged than others, as is normally the case.

Bernardo Maragone (c.1108 – c.1188), diplomat and authoritative Italian author of the *Annales Pisani*, reports that there were also serious collapses in the castle of Uringa. According to Mayer (1989), this is the medieval and modern Arab town of Harim (Harenc in Latin), situated in present-day northern Syria near the Syro-Turkish border, between Antioch and Aleppo.

The earthquake also caused damage in Damascus and Tyre (now Sur), although significantly less than in the other centres mentioned above. In Damascus, the balconies of the Umayyad Great Mosque collapsed along with the tops of the minarets; there is mention of the death of just one person hit by a falling stone. In Tyre, situated on the coast of southern Lebanon, about 150 km south of Tripoli, several towers collapsed, but without causing much serious inconvenience for the inhabitants. The earthquake had a vast area of propagation. North-eastwards it affected present-day Turkish territory, being felt in Al-Ruha (Edessa in the Latin sources, present-day Urfa), Harran, Mardin, and Nisibin (present-day Nusaybin, in the Turkish province of Mardin Ili, near the Syrian border). From the very fact that they are mentioned, we deduce that the earthquake must have been strongly felt at these locations, and the damage threshold of V-VI MCS may have been approached. To the south of this area it spread in the desert of eastern Syria, where al-Raqqah (Ar-Raqqah) is mentioned, on the banks of the Euphrates; it was felt as far east as present-day Iraq, in Singar (modern Sinjar), Mosul (Al-Mawsil), and to the south, as far as Baghdad, Basra (Al-Basrah) and "other cities", not specified by the sources. The historian Sibṭ Ibn al-Jawzi (the only source to mention these locations) does not specify the level of effects. In attributing an intensity level we have taken account of two criteria: i) the types of source and the context of the narratives, which lead us to believe that such places would not have been mentioned if the earthquake had not been felt fairly distinctly; ii) the geographical situation, i.e. the distance of these cities from the epicentral area.

This decision has been reinforced by an analysis of the valuable witness report by Michael the Syrian; he in fact testifies that the earthquake was also strongly felt in the monastery of Mar Hananya, but that the building suffered no damage. This monastery is now Dair az-Zafaran (also known as Kurkmo Dayro in Syriac and Deyrulzafran in Arabic), and is situated about 6 km south east of the city of Mardin, in south-eastern Turkey. The account by William of Tyre is clear in indicating that in Palestine there was neither damage nor victims. Further confirmation of that comes from another Latin source, the *Chronicon quod dicitur Guillelmi Godelli* (see the Latin sources), from which it can be deduced that the main shock on 29 June 1170 in Jerusalem was strongly felt, but without any damage of note ("the holy city of Jerusalem shook strongly, but did not collapse thanks to God's goodness"). In our opinion, the shaking at Jerusalem can be confirmed at V-VI MCS, as indicated by Ben-Menahem (1979, 1991); but we do not have any confirmation for the suggested damage at Caesarea, on the Mediterranean coast about 230 km south of Tripoli — also mentioned by Ben-Menahem.

Lastly, our research has not found any evidence to suggest that the earthquake was felt in Egypt, as was argued by Ben-Menahem (1979) but questioned by Ambraseys *et al* (1994).

Social and economic effects

The accounts of the two Arab historians Sibṭ ibn al-Jawzi and Ibn al-Athir also provide some information about the effects that the earthquake caused on the anthropic context. In Aleppo, the surviving inhabitants sought refuge in the surrounding countryside; man

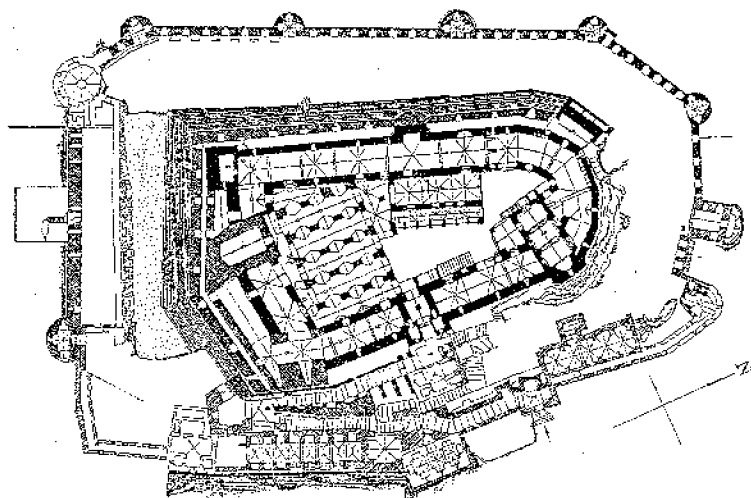


fig. 44 Krak des Chevaliers, one of the most famous medieval castles in the Mediterranean area, was damaged in the 1170 earthquake. Plan of the castle, which stands 750 m above sea level. Note the extensive and complex internal articulation and the fortifications. The double external wall and the complicated entry system made access difficult (from Molin 2001).

survivors, however, were also terrified of remaining outside the city, for fear of an attack by the Franks. The governor of Aleppo and Damascus, the famous Nur al-Din (Elisséeff 1967), having taken note of the very serious damage that had struck Aleppo, set up camp nearby and personally directed the work of reconstructing the walls and buildings, also taking into account the fact that the city could be treacherously attacked by the Crusaders. By way of confirmation of the seriousness and extent of the damage, the sources report that the cost of the reconstruction work was extremely high. Another location visited by Nur al-Din was the city of Ba'rin. The Syrian governor was indeed worried for his own safety, given that the location was very close to the Crusaders' military outposts. The historian Ibn al-Athir records that there was frantic repair work in the Crusaders' territories as well, since they feared an attack from Nur al-Din ("both parties rushed to reconstruct, each one fearing the other"). Indeed, the reconstruction was immediate and required enormous sums of money in Antioch too. At Krak des Chevaliers (Hisn al-Akrad) the work went on for a long time. As has been mentioned above, Amalric I donated the castles of Archis and Gibelacar to the Hospitaller Knights in order to improve his shaky finances, on condition that they rebuilt them. In Damascus, most of the population was panic-stricken and, fearing new shocks, abandoned the city and sought refuge in the desert.

Historical sources: an overall view

The earthquake struck during the period between the Second and Third Crusades. The serious damage it caused remained impressed on the memories of contemporaries, and was passed down to later generations. Hence the large number of sources which record it, each adding to the information provided by the others.

Three independent source traditions can be distinguished: Latin (including Italian and French), Syriac and Arabic. Another small and more heterogeneous group consists of Armenian, Greek and Hebrew sources. The *corpus* of sources set out here is the same as that used in Guidoboni *et al.* (2004), where those in Latin have been shown to make a fundamental contribution to our understanding of the event.

The most important Latin sources are three documents: a letter and a document from Amalric I, an appeal from pope Alexander III and the chronicle of William of Tyre. He was a contemporary writer, and indeed the most important Latin author in the Holy

Land. He was in Syria from 1162 onwards, and was appointed archbishop of Tyre in 1175. The letter from king Amalric I of Jerusalem to king Louis VII of France (1137-1180) was written in July-August 1170. The document of 1170, also from Amalric I, certifies that the castles of Archas (Arche) and 'Akkar (Gibelacar) are ceded to the Knights of the Order of St. John of Jerusalem (the Hospitallers), on condition that they are rebuilt. The appeal to the Church of France for funds was drawn up on 8 December 1170 on the orders of pope Alexander III (1159-1181).

The other Latin sources are much briefer and in more general terms than the above, so we only list those which date to the 12th century:

Annales Pisani of Bernardo Maragone, a politician and ambassador of Pisa;

Annales Vizeliacenses from the abbey of Vézelay: they go back to the middle of the 12th century, and were continued up to 1343;

Chronica of Robert of Torigny (or Robertus de Monte), a monk at the abbey of Bec from 1128 to 1154, and subsequently abbot of Mont-St-Michel;

Annales Floreffenses, from the abbey of Floreffe;

Chronicle mistakenly attributed to William Godel but in fact compiled by an unidentified author who belonged to the entourage of the archbishop of Sens;

Annales Colonienses maximi, drawn up in the 1170s by a canon of Cologne cathedral, and continued up to 1220;

Annales Gastinenses, a shortened version of the *Annales Uticenses*, which was continued from 1161 to 1226 by the monks of the abbey of Gâtines;

Annales Magdeburgenses, compiled in the monastery of Kloster Berge, near Magdeburg, up to 1188, and continued up to the mid-15th century;

Annales Admuntenses from the abbey of Admont, compiled by various hands from the second half of the 12th century up to 1250.

As far as Syriac sources are concerned, the most important is the chronicle compiled by Michael the Syrian, a contemporary writer. His text was used by Bar Hebraeus, a 13th century writer, in his chronicle. There is also a brief reference to the earthquake in the *Chronicon ad annum Christi 1234*, compiled in the first half of the 13th century.

Of the Arabic sources, the most informative are Ibn al-Athir, a historian from Mosul who visited Baghdad and Aleppo, and Sibṭ ibn al-Jawzi, who settled at Damascus. Both these writers lived in the second half of the 12th century and the first half of the 13th. Reports of the earthquake in the works of 13th century writers are much briefer and more telegraphic. The writers concerned are: the historian and biographer Ibn al-'Adim, a native of Aleppo; the historian and textual scholar Abu Shama, from Damascus; the historian Ibn Wasil, who was also an ambassador; and the historian and geographer Ibn Shaddad, a native of Aleppo who later lived in Egypt. Of later writers, we pick out Ibn Qadi Shuhba, a Syrian who lived in the second half of the 14th century and the first half of the 15th.

The earthquake is recorded not only in the above-mentioned three traditions, but also in one contemporary Jewish source, the traveller Benjamin of Tudela, a native of Spain, in one contemporary Greek source, namely the work of Neophytus Enkleistus, a Cypriot saint and hagiographer; and it gains a passing mention in a few Armenian sources: namely, what are known as the Annals of King Het'um (*Chron. min. Arm.*, I.3, p.76) and a brief anonymous chronicle (*Chron. min. Arm.*, II.24, p.502).

Latin sources

ARCHIVAL DOCUMENTS

A few weeks after the earthquake, in July-August 1170, king Amalric I of Jerusalem sent a letter to king Louis VII of France (1137-1180). It has been published in Mayer (1989, p.484):

"To Louis by the grace of God the most Christian king of the Franks, most dear lord and father, from Amalric, by the same grace of God king of Jerusalem, greetings. Amidst

1. Latin 29
2. Arabic 8
3. Syriac 3
4. Vulgar French 3
5. Vulgar Italian 3
6. Armenian 2
7. Hebrew 1
8. Greek 1

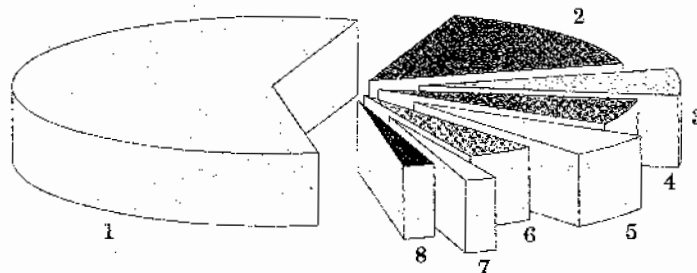


fig. 45 (elaborated after Guidoboni *et al.* 2004).

the daily torments of our enemies, which have so weakened the eastern church that it is close to ruin, there has come an extraordinary disaster through the just but hidden judgment of God. For on the day of the passion of the apostles Peter and Paul [29 June], a terrible earthquake suddenly and unexpectedly reduced the city of Tripoli to ruins, killing almost everyone who was there. It also shook Margat, Gabulum [Gabala] and Laodicea, and almost all the castles and towns between Tripoli and Antioch in such an amazing and indescribable way that no trace of buildings can be seen. In Antioch, too, quite apart from the fact that houses and other buildings were torn apart and almost all reduced to ruins, so that we are bound to speak with a deep groan of grief, town walls were damaged to such an extent that they seem to be beyond repair, and indeed they are. The result is that Antioch and Tripoli and their dependent provinces will be occupied by the enemies of the Cross of Christ, if Tripoli, Archas [Archis], Gibellum [Gibelacar], Laodicea, Margat and Antioch do not receive clandestine aid. But by the will of God, the land of the Gentiles is all laid waste, and their towns and fortresses have been more widely destroyed, not without some of their people being killed”.

Ludovico dei gratia christianissimo Francorum regi, domino et patri karissimo, Amalricus per eandem gratiam Iherosolimorum rex salutem. Cotidianis, quibus Orientalis ecclesia usque ad sui defectum contunditur, inimicorum infestationibus, inusitata celitus iusto, sepe tamen occulto, dei iudicio accessit calamitas. In passione namquam apostolorum Petri et Pauli subitus et hactenus inauditus terre motus totam Tipolim funditus delevit et omnem fere in ea carnem suffocavit. Similiter Margat, Gabulum, Laodiciam et omnia pene castella et civitates, que sunt a Tripoli usque Anthiochiam, miro et ineffabili modo excussit, ut nec edificiorum vestigia appareant. In Anthiochia quoque, quod non sine gravi gemitu loquimur, edificiorum et domorum, que ferme omnes corruerunt, discidium tacentes, tanta murorum ruina facta est, ut irreparabilis esse videatur et sit. Constat ergo quia Anthiochia et Tripolis cum provinciis sibi suffraganeis, nisi celitus eis subveniatur, ab inimicis crucis Christi occupabuntur: Tripolis, Archas, Gibellum, Laodicia, Margat et Anthiochia. Sed deo disponente terra gentilium miserabiliter tota dissipata est urbesque et munitiones non sine suorum occisione latius deiecte.

According to a document dating to 1170 (published in *Cartulaire de l'Ordre de St. Jean de Jérusalem*), Amalric I ceded the castles of Archis (Arche) and Gibelacar to the Hospitallers, on condition that they were rebuilt:

“In the name of the holy and indivisible Trinity, the Father, the Son and the Holy Spirit. Since it is our duty devoutly to seek the common benefit of the Christian community by means of wise justice and intuitive reasoning, and to excel in many other good works, we have taken steps, in accordance with the dictates of Divine Clemency, to ensure that the castles of Arche and Gibelacar, which have been reduced to ruins by the

earthquake, are not lost to the Christians. Let it therefore be known that [...] I, Amalric, by the grace of God, fifth king of the Latins of Jerusalem and regent of the County of Tripoli, have given to God and to the holy House of the Hospital and to Gilbert, by the grace of God, the venerable Master of the House, the above-mentioned castles of Arche and Gibelacar, in perpetuity with all their rights and appurtenances, in order that they shall be rebuilt [...]. In the year of the Incarnation of the Lord 1170, in the first indiction”.

In nomine summe et individue trinitatis, patris filii et spiritus sancti, amen. Quoniam communi christianitatis utilitati pie providere censura justicie et rationis intuitu ceteris etiam bonis operibus precellere dinoscitur, castro quod dicitur Arche et Gibelacar, terre motu funditus eversis, prout divina nobis administravit clementia, ne christiculis amitterentur subvenire curavimus [...] Patet igitur scire volentibus quod ego Amalricus, Dei gratia Jerosolimorum rex Latinorum quintus, Tripolis comitatum procurans, Deo et sanctae domui Hospitalis Jerusalem, et Giberto, Dei gratia domus ejusdem venerabili magistro [...] prenominata castra, Archas videlicet et Gibelacar, restauranda perhenniterque cum suis omnibus pertinentiis et juribus possedenda donavi [...]. Anno dominice incarnationis M C L XX, indictione prima.

As the editor of the letter points out, its dating presents some problems, for Gilbert d'Assailly, Grand Master of the Order of Hospitalers, proves to have resigned from this post around September 1169. However, negotiations to resolve the crisis at the head of the Order may well account for his still appearing formally in that position in 1170, and hence being the legal recipient of a royal deed of gift. Furthermore, his successor, Caste de Muriols, was certainly elected some time in 1171, though the exact date is not known (Delaville Le Roulx 1904, pp.78-9; king 1931, pp.98-9).

Worries over the situation resulting from the earthquake are evident in an appeal to the Church of France, drawn up on 8 December 1170 on the orders of pope Alexander III (1159-1181) to gather funds for the earthquake-stricken towns and castles in the Holy Land, and especially for the Church of Nazareth:

“Bishop Alexander, servant of the servants of God. Beloved sons, to all the faithful in the realm of France, [we give] apostolic blessing and [we wish them] good health. You will all have been able to learn, from the accounts of travellers, of the trials, tribulations, sufferings and troubles experienced by the towns, castles and other places in the Eastern Lands; nevertheless, it has seemed appropriate to us, not without much concern, to remind you of these things, and to urge you even more insistently to exercise your charity in the face of these disasters. By the inscrutable will of God, many towns and castles have been wholly or partly reduced to ruins or razed to the ground by the earthquake, and a multitude of people have lost their lives in the ruins. And emboldened by this, the enemies of Christ have tyrannically occupied some Christian places. Amongst these is a large and populous village belonging to the Church of Nazareth, where, for their sins, clergy and other inhabitants have been taken prisoner. For this reason, and because of other troubles, the canons of the above-mentioned church find themselves in a state of such want and poverty that, unless the other faithful come to their aid, they will no longer be able to remain in His church and pay their Creator his tribute. [...]. Issued at Tuscolo on the sixth day before the Ides of December [8 December]”.

Alexander episcopus servus servorum Dei. Dilectis filiis universis fidelibus per regnum Francie constitutis salutem et apostolicam benedictionem. Civitatum, castellorum et aliorum locorum terre Orientalis desolationem, tribulationes et angustias, pariter et dolores, licet ex relatione commeanantium vestra potuerit universitas didicisse, vobis tamen non sine merore necessarium duximus significare et ad compassionem tantorum malorum vestram sollicitare studiosius caritatem. Divino siquidem et occulto iudicio faciente ex terre motu plures civitates et oppida, quedam ex toto, quedam ex parte diruta et funditus evulsa, in ruina quorum ingens hominum multitudo est suffocata. Unde

quidam inimici contrarii Christi audaciam assumentes nonnulla loca Christianorum invasione tyrannica occuparunt; inter quae magnum et populosum casale ecclesie Nazarene peccatis exigentibus capientes clericos et ceteros habitatores in captivitatem duxerunt. Inde est, quod canonici prescripte ecclesie tum ex hoc, tum ex aliis malis et angustiis supervenientibus ad tantam devenere inopiam et paupertatem, quod nisi a Dei fidelibus adiuventur, in ecclesia sua non poterunt diutius ad summi conditoris obsequium permanere. [...]. Datum Tusculano VI idus decembris.

ANNALS AND CHRONICLES

As we have already pointed out, the most important Latin source is the chronicle of William of Tyre (pp.934-6), which provides a long and detailed description of the earthquake:

"A very great earthquake struck almost the whole of the East, and destroyed some very ancient cities. The following summer, that is to say in the seventh year of king Amalric's reign [king Amalric I of Jerusalem, 1163-1174], in the month of June, there was an earthquake of such violence in eastern parts that none greater is known to the memory of man in this century. It reduced to ruins some of the most ancient and best fortified cities in all the East, plunging their inhabitants into disaster and reducing buildings to rubble, with the result that there were very few survivors. From one end of these lands to the other, there was no place where families did not lose a member or suffer some domestic tragedy: lamentations and funerals were everywhere. Amongst these places, even cities in our provinces of Coelesyria and Phoenicia — great cities ennobled by their centuries-old history, have collapsed in ruins. In Coelesyria, the earthquake totally destroyed the city of Antioch, the capital of many provinces and once the head of many realms, killing its inhabitants. Its walls and the very strong towers along their circuit — a work of incomparable strength — were shaken with such violence, together with churches and other buildings, that even today, in spite of continuous work, enormous expenditure, constant care and devoted zeal, they can scarcely be said to have been restored to an acceptable condition. The coastal towns of Gabulum [Gabala] and Laodicea in the same province were also destroyed, as well as other inland towns held by the enemy: Vereca — also called Halapia [Aleppo] — Cesara [Shayzar], Hama, Emissa [Hims] and many others; not to mention countless smaller places. In Phoenicia, furthermore, on the third day before the Calends of July [29 June], towards the first hour of the day, the noble and populous city of Tripoli was suddenly shaken by so violent an earthquake that scarcely anyone who was there escaped alive. The whole city became a heap of rubble, burying the inhabitants, and crushing them beneath this public tomb. At Tyre, the most famous city in the province, on the other hand, an even more violent earthquake proved to be no danger to the population, though it did cause the collapse of some very solidly built towers. In enemy territory as well as our own, towns were seen to be half in ruins, and therefore helpless before the wiles and attacks of their enemies. Consequently, as long as each one feared to bring down upon himself the wrath of the stern judge, he took care not to injure his neighbour. Each had his own sufficient troubles, and since domestic affairs brought their own problems, harming one's neighbour was abandoned. A brief truce was arranged, thanks to the efforts of men, and a treaty was drawn up out of fear of divine judgment. And since each man expected due heavenly punishment for his sins, he held back from hurling himself upon the usual objects of his hostility, and curbed his aggression. In this case, divine wrath manifested itself not just once, as usually happens, but for three or four months or more; three or four times a day, and perhaps even more, by day and night, an awesome shaking of the earth was felt. Every shock was regarded with apprehension, and nowhere was it possible to live in calm and safety. And even the minds of those who slept were so cast down by the fears of waking hours, that the calm of sleep was broken, and their bodies suddenly shook in agitation. However, our

upper provinces — Palestine, that is to say — with all that they contain, were spared these great ills by the grace of God”.

Terremotus maximus pene universum concutit Orientem et urbes deicit antiquissimas. Estate vero sequente, anno videlicet domini Amalrici septimo, mense Iunio, tantus tamque vehemens circa partes Orientales terremotus factus est, quantus qualisque memoria seculi presentis hominum nunquam legitur accidisse. Hic universi Orientalis tractus urbes antiquissimas et munitissimas funditus diruens, habitatores earum ruina involvens edificiorum casu contrivit, ut ad exiguam redigeret paucitatem. Non erat usque ad extremum terre locus, quem familiaris iactura, dolor domesticus non angeret: ubique luctus, ubique funebria tractabantur. Inter quas et provinciarum nostrarum Celessyrie et Phenicis urbes quam maximas et serie seculorum antiquitate nobiles, solotenus deiecit: in Celessyria multarum provinciarum metropolim olimque multorum moderatricem regnorum Antiochiam cum populo in ea commorante, stravit funditus, menia et in eorum circuitu turres validissimas, incomparabilis soliditatis opera, ecclesias et quelibet edificia tanto subvertit impetu, quod usque hodie multis laboribus, sumptis immensis, continua sollicitudine et indefesso studio vix possint saltem ad statum mediocrem reparari. Ceciderunt in eadem provincia urbes egregie, de maritimis quidem Gabulum et Laodicia, de mediterraneis vero, licet ab hostibus detinerentur, Verea, que alio nomine dicitur Halapia, Cesara, Hamam, Emissa et alie multe, municipiorum autem non erat numerus. In Phenice autem Tripolis, civitas nobilis et populosa, tercio Kalendas Iulii tanto terremotus impetu circa primam diei horam subito concussa est, ut vix uni de omnibus, qui infra eius ambitum reperti sunt, salutis via pateret: facta est tota civitas quasi agger lapidum et oppressorum civium tumulus et sepulchrum publicum. Sed et Tyri, que est eiusdem provincie metropolis famosissima, terremotus violentior, absque tamen civium periculo, turres quasdam robustissimas deiecit. Inveniebantur tam apud nos quam apud hostes opida semiruta, insidiis et hostium viribus late patentia, sed dum quisque districti iudicis iram sibi metuit, alium molestare pertimescit. Sufficit cuique dolor suus et dum quemlibet cura fatigat domestica, alii differt inferre molestias: facta est, sed brevis, pax, hominum studio procurata, et foedus compositum, divinorum iudiciorum timore conscriptum, et dum indignationem peccatis suis debitam expectat quisque desuper, ab his que hostiliter solent inferri manum revocat et impetus moderatur. Nec ad horam, ut plerumque solet, fuit ista ire dei revelatio, sed tribus aut quattuor mensibus, vel etiam eo amplius, ter aut quater vel plerumque saepius vel in die vel in nocte sentiebatur motus ille tam formidabilis. Omnis motus iam suspectus erat et nusquam tuta quies inveniebatur, sed et dormientis animus plerumque, quod vigilans timuerat perhorrescens, in subitum saltum, rupta quiete, corpus agitari compellebat. Superiores tamen nostre provincie, Palestine videlicet, horum omnium domino protegente fuerunt expertes malorum.

The fact that the author draws attention to the greater violence of the earthquake at Tyre, without the city suffering much damage, may reflect a desire on his part to emphasise both the solidity of its buildings and the divine protection bestowed upon it. Of the other Latin sources listed above, we quote only the *Annales Pisani* of Bernardo Maragone: “In the year of our Lord 1171, in the third indiction. Since the times of Dathan and Abiron and of Sodom and Gomorrah, there have never been such amazing and disturbing prodigies as those which then took place in the land of Jerusalem. The city of Tripoli with its great church dedicated to the Blessed Virgin Mary and all its people, and half the city of Antioch, with the church of St. Peter the Apostle, where the the saint's throne was preserved, as well as many villages and castles belonging to the above cities, were destroyed by an earthquake on the very day of the feast of St. Peter, which falls on the third day before the Calends of July [29 June]. And the earthquake caused the death of at least forty thousand Christians and many animals. On the same day, Aleppo, Cesara [Shayzar] and Hama, large towns belonging to the Saracens, together with their depend-

ent villages and castles, including the great castle of Uringa [Harim], were destroyed by the earthquake. It caused the death of more than two hundred thousand Saracens".

Anno Domini MCLXXI, indictione III. A temporibus Dathan et Abiron et Sodome et Gomorre non fuerunt tam miranda et stupenda prodigia, qualia evenerunt in terra Ierosolimitana. Civitas Tripoli cum magna ecclesia dedicata ad honorem beate Virginis Marie, cum toto populo, et medietas civitatis Antioche cum ecclesia beati Petri apostoli, in qua cathedra eius fuit, et cum aliquantibus villis et castellis predictarum civitatum, ipsa sollempnitate sancti Petri, que est III Kalendas Iulii, a terre motu subverse sunt. De quo terre motu XL milia hominum chrisitanorum et ultra perierunt, et bestie multe. Similiter eodem die Alap, Cesaria, Emma, civitates magne Sarracenorum, cum parte villarum et castrorum earum, et Uringa castrum magnum, a terre motu subverse sunt. De quo terremotu CC milia Saracenorum et ultra perierunt.

Syriac sources

The most important Syriac source is the chronicle of Michael the Syrian, which records: "In the same year fourteen hundred and eighty-one [of the Greeks, 1170], on Monday 29 Haziran [June], there was a violent earthquake, and the earth trembled like a boat on the sea [the beginning of Michael the Syrian's account is missing in the original Syriac, and so the opening sentence has been supplied from the parallel passage in Bar Hebraeus] [...] We were in the monastery church of Mar Hananya, and lay prostrate before the altar, to which we clung and were tossed about from one side to the other [...] when we saw and heard and were assured that there was absolutely no damage in the monastery nor in the whole region. And when we heard what horrors had taken place in the lands and in the cities [...] In this earthquake, the city of Berotha, that is to say Aleppo, collapsed in ruins... And those who said that God could not save or deliver the prisoners from their hands [i.e. from the Arabs], were suddenly heaped up in piles by the earthquake: their walls and their houses were reduced to ruins, and the air and the water became infected by (the bodies of) the suffocated. The whole city was rent asunder and became a series of cracks and fissures. The black ones (?) went up on them. The whole city became a heap of ruins. And what shows most clearly that the sword of anger had been drawn against it, is that nowhere else was there such horror. The seaward wall of Antioch collapsed, and the great church of the Greeks collapsed completely. The sanctuary of the great church of St. Peter collapsed, as well as houses and churches in various places. About fifty souls died in Antioch. Jabala completely collapsed. And in Tripoli a large part (of the city) and the great church similarly collapsed. And in the other coastal cities, and at Damascus, Homs and Hama, and in all the other towns and villages, the earthquake caused major disasters; but nowhere else had a disaster similar to that which had happened to Aleppo been seen or heard of [...] Although the whole town of Aleppo collapsed, our church was preserved and not a single stone fell from it. And in Antioch three churches were saved for us: that is to say, the church of the Mother of God, and those of St. George, and St. Barsauma. In Jabala, too, the little church we had was preserved, and the same is true of the churches in Laodicea and Tripoli".

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1170

أتت عليها وبلغ الرعب ممن نجا كل مبلغ وكانوا لا يقدررون أن يأووا إلى مساكنهم السائلة من الخراب خوفا من الزلزلة فإنها عاودتهم غير مرة وكانوا يخافون يقيمون بظاهر حلب من الأفرنج فلما شاهد ما فعلت الزلزلة بها وبأهلها أقام بظاهرها وبأشرف عمارتها بنفسه وكان يقف على استعمال الفعلة والبنائين فلم يزل كذلك حتى أحكم أسوارها وعمر جميع البلاد وجوامعها وأخرج من الأموال ما لا يقدر قدره. وأما بلاد الأفرنج خذلهم الله تعالى فإن الزلازل أيضا عملت بها كذلك فاشتغلوا بعمارة بلادهم خوفا من نور الدين عليها فاشتغل كل منهم بعمارة بلاده خوفا من الآخر.

Sibt Ibn al-Jawzi also provides a great deal of information:

"In the month of *Shawwal*, there were terrible earthquakes in Syria, causing severe damage at Damascus: the balconies of the mosque [the Great Umayyad Mosque] collapsed, as well as the tops of the minarets, which shook like palm trees on a stormy day. [...] The earthquakes which struck Aleppo were even stronger: half of its citadel collapsed, and there was severe damage in the city; 80,000 people are reckoned to have died in the ruins. The walls of all the fortresses were damaged, and the people fled into the countryside. Hisn al-Akrad collapsed, and no trace of its walls was left. The same thing happened at Hamat and Hims. When Nur al-Din came to Aleppo, he was worried that the collapse of its walls would expose it to enemy attack. The earthquake was felt everywhere. Muslim fortresses were destroyed throughout the province of Syria: at Aleppo, at other towns, and at Antioch. The earthquake even reached Laodicea and Jabala, and struck all the coastal towns, as far as Byzantine territory. They say that the only man to be killed at Damascus was struck by a piece of stone as he climbed the Jayrun steps, the entire population having fled into the desert. The earthquake then reached the Euphrates, struck Mawsil, Sinjar, Nisibin, al-Ruha, Harran, Al-Raqqqa, Mardin and other towns as well, reaching as far as Bagdad, Basra and other towns in Iraq. No-one had ever seen such an earthquake since the beginning of Islam".

وفي شوال كانت بالشام زلازل هائلة بحيث وقع معظم دمشق وشرفات الجامع وسقف رؤس المنابر وكانت تهتز مثل النخل في يوم ريح عاصف. وكانت بحلب أعظم بحيث وقع نصف القلعة والبلد فهلك من أهلها ثمانون ألف تحت الهدم وتهدمت أسوار جميع القلاع وخرج أهلها إلى البراري ووقعت قلعة حصن الأكراد بحيث لم يبق للسور أثر وكذا حماة وحمص. وسار نور الدين إلى حلب خوفا عليها من العدو ولأنها بقيت بغير أسوار. وكانت هذه الزلزلة عامة في الدنيا وأخرت قلاع السلميين وبلادهم بالشام وحلب والعواصم وأنطاكية ونزلت على اللاذقية وجبله وجميع بلاد الساحل إلى بلاد الروم. ويقال أنه لم يمت من دمشق إلا رجل واحد أصابه حجر وهو على درج جيرون لأن أهلها خرجوا إلى الصحراء ثم امتدت الزلزلة وقطعت الفرات فوصلت إلى الموصل وسنجار ونصيبين والرها وحران والرقّة وماردين وغيرهم وامتدت إلى بغداد وواسط والبصرة وجميع بلاد العراق. ولم تر الناس زلزلة من أول الإسلام مثلها أفنت العالم.

The accounts provided by the other four 13th century Arab historians are much briefer. According to Abu Shama "al-Imad al-Isfahani said: the Frankish citadels of Hisn al-Akrad, Safita and 'Arqa, near Ba'rin, collapsed in the waves of the earthquake; the first of the three, in particular, was left without walls, and rebuilding work kept the Franks occupied for a long time. From all parts of Syria came news of earthquakes and their disastrous effects; but one piece of news gladdened hearts in the midst of such desolation: the damage inflicted on Frankish camps was even worse. For the earthquake caught them on a feast day, when they had gathered in church. Ceilings collapsed on their heads, and so punishment came whence they would never have expected it".

قال العماد الإصفهاني: وكانت قلاع الأفرنج المجاورة لبعيرين ولحصن الأكراد وصافيتا وعرقا في بحر الزلازل غرقى لا سيما حصن الأكراد فإنه لم يبق له سور وقد تم عليه فيه دحور وثبور فشغلهم سؤمهم عن سواه وكل اشتغل بما داهاه. وتواصلت الأخبار من جميع بلاد الشام بما أحدثته الزلزلة من الانهدام والانهدام. قال وما سكنت النفوس من رعبها وتسلسل القلوب عن كربها إلا بما دهم الكفار من أمرها وعراهم من ضررها فلقد خستهم بالأمس وأخذتهم الرجفة فإنها وافقت يوم عيدهم وهم في الكنائس فاصبحوا للردى فرائس

شاخصه أبصارهم ينظرون فخر عليهم السقف من فوقهم وأتاهم العذاب من حيث لا يشعرون.

Ibn Wasil simple records:

"This earthquake came to be known as the earthquake of Aleppo and its region, just as that of the year 552 was the earthquake of Hamat".

وهذه الزلزلة المعروفة بزلزلة حلب وبلادها نظير الزلزلة التي كانت بحماة سنة اثنين وخمسين وخمسمائة.

Ibn al-'Adim reports:

"Nur al-Din was informed of the earthquakes which had struck Syria, especially the one which had destroyed Aleppo, and which, because of the continuing shocks, had caused the inhabitants to abandon the town and take refuge in the country from dawn on Monday 12 *Shawwal* [30 June]".

فأتاه (نور الدين) خبر الزلازل الحادثة بالشام فانها خربت حلب خرابا شنيعا وخرج أهلها الى ظاهرها وتواترت الزلازل بها أياما متعددة وكانت في ثاني عشر شوال من السنة يوم الاثنين طلوع الشمس.

Finally, Ibn Shaddad reports:

"There was an earthquake at Aleppo which destroyed a large part of that region. It was on 12 *Shawwal* in the year 565. Many confuse this earthquake with that of 552".

جاءت زلزلة بحلب وأخرت كثيرا من البلاد وذلك في ثاني عشر من شوال سنة خمس وستين وخمسمائة وهذه غير تلك (زلزلة حماة سنة ٥٥٢) فلا يظن الواقف عليه أن هذا غلط بل هما زلزلتان.

Hebrew source

A 12th century Jewish traveller, Benjamin of Tudela, a native of Spain, made a long journey to visit numerous Hebrew communities in the Near East. In his account he mentions some violent earthquakes that hit Tripoli and Hamah, and that caused the death of many Jews. The text by Benjamin does not contain any explicit chronological references, if we exclude the citing of the year 4933 of the Hebrew calendar, corresponding to 1173 of the Julian calendar, inserted by the author to indicate the year of his return to Spain. However, the implicit chronological references in this text allow us to date Benjamin's journey between the first half of the 1160s and 1173. In the passage that is referred to Tripoli of Syria, Benjamin writes that the earthquake had occurred "in the past years", and in the one concerning the city of Hamah, "several years before". According to Prawer (1988, pp.193-4), in both cases Benjamin was referring to the earthquake of 29 June 1170. The text of the two passages is the following: "Some years ago there was an earthquake at Tripoli, in which many Jews and Gentiles lost their lives, because houses and walls collapsed on top of them. At that time, the whole of Eres Isra'el was laid waste, and more than twenty thousand people died there. [...]. Hamah, that is to say Hamath, is one day's journey [from Hims]; it stands on the banks of the river Jabboq, at the foot of Mt. Lebanon. Some years ago, there was a great earthquake in the city and in a single day twenty-five thousand people were killed, of whom about two hundred were Jews, but seventy survived".

טריפולי

ועם השלטון טריפולי הוא טרובלוס אל שאם ובימים הראשונים רעשה הארץ של טריפולי ומתו רבים מן הגוים ומישראל כי נפלו הבתים והחומות עליהם והיתה מפולת גדולה באותו הזמן בהם ובכל ארץ ישראל ומתו יותר מעשרים אלף בני אדם.

חמץ וחמת

ומשם מהלך יום לחמץן והיא עיר הצמרי ובה כמו עשרים יהודים. ומשם דרך יום לחמה היא חמת יושבת על נהר יבק תחת הר הלבנון. ובימים ההם בא רעש גדול בעיר ומתו ביום אחד כה אלף בני אדם וגם מן היהודים כמו מאתים. ולא נשארו בה כי אם שבעים.

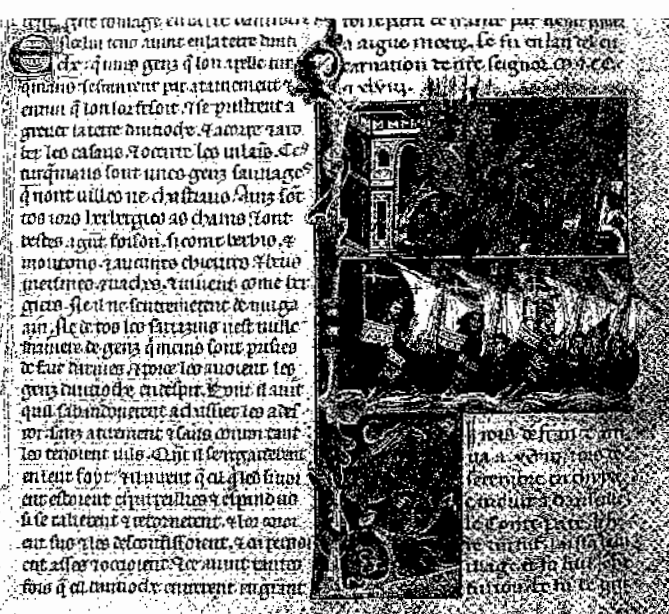


fig. 46 A passage from the *Histoire d'Outremer* by William of Tyre preserved in a 13th century codex in the Biblioteca Mediceo-Laurenziana in Florence (*Plutei* 61.10).

Greek source

We think we can add to our corpus of sources the text of Neophytus Enkleistus, who was living on the island of Cyprus:

"Then [after the Paphos earthquake of c.1165], a short time later, a monk of the great city of Antioch came to see me, and told me that there had been a tremendous earthquake in that city; not only, he said, was the earth violently shaken, but it also made a roaring noise and was split open, and stones were thrown down as though into an abyss. As the earth joined together again, stones which were on the upper edges were hurled upwards as though they had been thrown by a ballista. Not only did the town walls and a large proportion of houses collapse, but also the great church, killing the patriarch and a great many other people".

Εἶτα μετὰ καιρὸν οὐ συχνὸν μοναχὸς τις ἐξ Ἀντιοχείας τῆς μεγάλης ἀφίκετο πρὸς με, ξένον καὶ φοβερὸν σεισμὸν διηγούμενος ἐν ἐκείνῃ συμβηθηκέναι τῇ πόλει· οὐ μόνον, φησί, σοδράς ἢ γῆ κατεσείετο, ἀλλὰ καὶ ἐμυκάτο καὶ κατεσχίζετο καὶ οἱ λίθοι κάτω ὡς ἐπὶ φάραγγος κατερρίπτοντο. Ἐν δὲ τῷ σμίγεσθαι πάλιν τὴν γῆν, ὅσοι περὶ τὰ ἀκρόχειλα εὐρίσχοντο λίθοι ὥσπερ ἐκ πετροβόλου ἀφιέμενοι πρὸς ὕψος ἐξηκοντίζοντο. Καταπεπτώκασι δὲ οὐ τείχη μόνον καὶ πλείστα τῶν οἰκημάτων, ἀλλὰ καὶ ἡ μεγάλη ἐκκλησία, ἐξ ἧς καὶ ὁ πατριάρχης κατεφονεύθη καὶ πλῆθος λαοῦ πολλοῦ.

In the period of this earthquake, between Syria and Turkey there was also a small Armenian kingdom (Lesser Armenia or Armenian Cilicia). Presumably some mention of this earthquake in several Armenian chronicles was due to direct contact with the affected areas. There are two Armenian texts that contain some reference to this earthquake: the so-called Annals of King Het'um (*Chron. min. Arm.*, I.3, 76) and a short anonymous chronicle (*Chron. min. Arm.*, II.24, 502), both published by Hakobyan (1951-56).

▲ 1170 06 29 3:45 UT ★ = 34 39 36 11 Io = X Me = 7.7 Sites: 29

localities	lat.	long.	I	localities	lat.	long.	I
Mathanat ad Dullb. RL	34 32	36 05	X	Tripoli RL	34 26	35 51	X
Aleppo SYR	36 14	37 10	X	Antioch TR	36 14	36 07	IX
Akkar al Atiqah RL	34 32	36 14	X	Bealbek RL	34 20	36 12	IX

location	lat.	long.	I	location	lat.	long.	I
Ba'rin SYR	34 56	36 25	IX	Ar-Raqqab SYR	35 57	39 01	VI
Jablah SYR	35 21	35 55	IX	Urfa TR	37 08	38 46	VI
Hamah SYR	35 09	36 44	IX	Harran TR	36 51	39 23	VI
Harim SYR	36 12	36 31	IX	Jerusalem IL	31 46	35 14	V-VI
Hims SYR	34 44	36 43	IX	Dair az-Zafaran TR	37 17	40 46	V-VI
Qalat al-Hisn SYR	34 46	36 19	IX	Mardin TR	37 19	40 43	V
Al-Ladhiqiya SYR	35 31	35 47	IX	Nusaybin TR	37 05	41 11	V
Margat SYR	35 09	35 57	IX	Baghdad IRQ	33 20	44 23	IV
Shayzar SYR	35 16	36 34	IX	Mosul IRQ	36 20	43 08	IV
Safita SYR	34 49	36 07	VIII-IX	Sinjar IRQ	36 19	41 52	IV
Damascus SYR	33 30	36 19	VII-VIII	Al-Basrah IRQ	30 29	47 49	F
Tyre RL	33 16	35 11	VII				

< 090 > **1170 September 14 - 1171 September 3 [566 H.]**
Cordoba [southern Spain] > ground liquefaction <

source Ibn Rushd [Averroes], *Talkhis*, fols.142r.-142v.
literature Taher (1979)
catalogues d. Ligorio [1570-74]; Bonito (1691)
catalogue p. Poirier and Taber (1980)

In the year of the Hegira 566 (14 September 1170 - 3 September 1171), Cordoba and its territory, in southern Spain, were struck by a long seismic sequence, which caused much destruction and killed many people. The sequence, which was accompanied by loud noises, persisted for three more years, without causing further damage. At Andujar, near Cordoba, sand and ashes came out of a crack in the earth. The phenomenon concerned was probably ground liquefaction. The source for this earthquake is Ibn Rushd [Averroes], who describes the seismic sequence in the following terms in his commentary on the work of Aristotle:

"Anyone who saw with his own eyes the earthquake which occurred at Cordoba in the year 566, has received confirmation [of the Aristotelian theory of earthquakes]. I was not at Cordoba at the time, and when I arrived, I heard the rumble which preceded the earthquake; people thought the rumble came from the west. I saw the earthquake being generated by the progressive movement of west winds. These earthquakes persisted at Cordoba throughout the year, and only ceased after about three years. The first earthquake caused great destruction and killed many people; it was said that at a place near Cordoba called Andujira [Andujar], the earthquake caused the earth to split open and something similar to ashes and sand came out of the fissure. To the east of Cordoba the effects were even more violent, whereas they were slighter to the west".

ومن شاهد الزلزلة الحادثة بقرطبة وجهاتها عام ست وستين وخمسةائة للهجرة وقع له اليقين بذلك الكثرة ما عرض هنالك من الأصوات والدوى ولم أكن حاضرا حينئذ بقرطبة ولكني وصلت اليها بعد فسمعت أصواتا تتقدم حدوث الزلزلة ويشعر الناس أن ذلك الصوت يأتي من جهة المغرب. ورأيت الزلزلة تتولد عند نشوء الرياح الغربية كثيرا. وتمادت هذه الزلازل بقرطبة نحو العام شدادا ولم تنقطع الا بعد ثلاثة أعوام أو نحوها وقتلت الزلزلة الأولى ناسا كثيرا بالهدم وزعموا أن الأرض انشقت بقرب قرطبة بموضع يعرف بأندوجرة فخرج منها شبه رماد أو رمل. ومن شاهدها وقع اليقين بها. وكانت شرقا من قرطبة أشد مما كانت بقرطبة وكانت غربا من قرطبة أخف مما كانت بقرطبة.

▲ 1170 09 14 - 1171 09 03 [566 H.]

localities	lat.	long.	I	localities	lat.	long.	I
Cordoba	37 53	-04 46	IX	Andujar	38 02	-04 03	EE

< 091 > **1172 September 26 Messina [Sicily, Italy]**

source *Notula* in Lampros (1910, p.133, no.22) and in Evangelatou-Notara (1982, p.210, no.435)
literature Guidoboni and Traina (1996); Valensise and Guidoboni (2000)
catalogues d. Grumel (1958)

On 26 September 1172 at about 13:30 UT (the ninth hour, or 12:30, local time) an earthquake described as "dreadful and very terrible" struck the city of Messina.

This earthquake has been known to the literary and historical traditions, but not to that of seismological studies. It has now been studied by Guidoboni and Traina (1996, pp.1215-6), within the framework of a review of earthquakes in Sicily up to the end of the 13th century. The source is a *Notula* in the margin of manuscript 73 from the church of S.Salvatore in Messina (Lampros 1910, p.133, no.22 and Evangelatou-Notara 1982, p.210, no.435). It is to be found at fol.306, and states:

"On 26 September, in the sixth indiction, in the year 6681 [1 September 1172 - 31 August 1173], at the ninth hour, there was a dreadful and very terrible earthquake at Messina, caused by our sinfulness".

Μηνὶ Σεπτεμβρίῳ κα', ἰνδ. ς' ἔτει κχπα', ὥρα θ' γέγονε σεισμός ἐν τῇ Μεσσηνίᾳ πόλει, διὰ τὰς ἐμὰς ἀμαρτίας φοβερός καὶ ἔμφοβος λίαν.

▲ 1172 09 26 13:40 UT

localities	lat.	long.	I
Messina	38 11	15 33	VIII

< 092 > **1183 December? Verona [northern Italy]**

source 1 Paris. Cerea, *Ann.*, p.5
sources 2 BCVR, 958, *Hist. Long.*, fol.11; Zagata (ed. 1745-47), p.196
historiography Bardi (1581a); Sigonio (1591); Tinto (1592); Dalla Corte (1594); Panvinio (1648); Tatti (1683); Biancolini (1757); Visi (1782); Tovazzi (ed. 1986); Da Persico (1838); Sormani Moretti (1904)
catalogues d. Bonito (1691); von Hoff (1840); Perrey (1848); Mallet (1853); Goiran (1880); Mercalli (1883); Bettoni (1888); Baratta (1901); Milne (1911); Zanon (1937); Alexandre (1990); *Boschi *et al.* (1995, 1997, 2000)
catalogues p. Giorgetti and Iaccarino (1971); Carrozzo *et al.* (1973); Postpischl (1985)

In early January 1184, part of the outer wall of the Arena in Verona collapsed. According to the chronicler Parisio da Cerea, this was the "delayed effect" of an earthquake which had occurred some time earlier. This earthquake is not recorded, however, in sources from other towns in the Veneto, Lombardy or Emilia. However, this cannot be taken as *ex silentio* evidence that the earthquake did not occur, because 12th century chronicle sources are often selective in their coverage. As far as Verona is concerned, no confirmation of the report can be found in contemporary archive documents, because the old archives of the commune are mostly lost. The only Veronese annal source of the period to mention the earthquake is Parisio da Cerea (13th c.), in whose *Annales* we read:

"In the said year [1184], at the beginning of the month of January, a large part of one wing of the Arena at Verona collapsed as a result of an earthquake which had occurred some time earlier. The wing concerned was the outer one".

Millesimo supradicto intrante mense Ianuario maxima pars alae arenae Veronae cecidit terrae motu magno per prius facto, videlicet ala exterior.

This brief reference to the earthquake by Parisio contains an internal dating in the form

of a reference to the presence of pope Lucius III and the Emperor Frederick I in Verona; for the emperor's sixth expedition to Italy began in 1184 and lasted until 1186. It seems reasonable to interpret this passage as an account of two separate events: an earthquake which weakened part of the Arena's, and a subsequent collapse in January 1184. The *Historia longobardica seu historia veronensis* (Biblioteca Civica, Verona, ms. 958), is a 15th century text which starts the tradition, taken up by later historiography, that the amphitheatre collapsed as a result of the 1183 earthquake. The information that part of the Arena was in a damaged state is indirectly confirmed by the historian Biancolini (1757, p.68), who quotes municipal statutes and states that "in order to repair it [the Verona amphitheatre], the commune of Verona spent the sum of five hundred *lire* every year".

It must be emphasised, however, that it had been common practice for centuries to remove stone and marble from the amphitheatre for use elsewhere. It is therefore likely that when the local authorities took the action recorded in the statutes, they were partly repairing the plunder of centuries.

As for the "delayed effects" of strong earthquakes, there is also the case of the church of St. Sophia in Constantinople in 1346, a mistaken interpretation of which gave rise to a false earthquake (see Guidoboni and Comastri 2002).

▲ 1183 12?

localities	lat.	long.	I
Verona	45 26	11 00	VI-VII?

< 093 > 1184 May 24 Crati Valley [Calabria, southern Italy]

- sources William II, *Privilege*, 2 April 1185 (in Garufi 1899, no.LXXXII, pp.200-2); Goffredo of Carbonara, Deed of grant, September 1196; Honorius III, *Order*, 29 October 1221, *Privilege*, 3 June 1222; Frederick II, *Diploma*, February 1222 (in Pratesi 1958, no.48, pp.112-5; no.127, pp.298-300, no.130, pp.305-7; no.128, pp.300-2); *Ann. Casinen.*, p.313; Scasilio, *Cron. Sambucin.*, in Marchese (1957, p.298)
- historiography Barrio (1737); Di Meo (1795); Spanò Bolani (1857); Camera (1860); Garufi (1899); Gallo (1901); Kehr (1902); Garufi (1908); Dito (1916); Borretti (1933); Russo (1957); Pratesi (1958); Marchese (1957); Di Blasi (1972); Valente (1973); Cilento (1981)
- catalogues d. Bonito (1691); Perrey (1848); Mallet (1853); Capocci (1861-63); Mercalli (1883, 1897); Baratta (1901); De Stefano (1987); *Boschi *et al.* (1995, 1997, 2000)
- catalogues p. Giorgetti and Iaccarino (1971); Carrozzo *et al.* (1973); Postpischl (1985); CPTI (1999)

On 24 May 1184, an earthquake caused damage in a number of towns in the valley of the river Crati, in northern Calabria. There were collapses at the cathedral of Cosenza and of Bisignano, the abbeys of Sambucina and Matina suffered damage, and the walls of the fortified village of San Lucido also collapsed. There was also damage at the Benedictine monastery of S.Maria di Valle Josaphat, which is mentioned in an 1185 royal diploma of William II the Good (1166-1189): a document containing an earlier privilege granted by Roger II had been lost in the collapses. The monastery, now known as S.Maria di Monte Persano, was situated in the diocese of Cosenza, 3 km east of the village of San Lucido. The abbey of Sambucina was an old monastery which had originally belonged to the Benedictines, but passed to the Cistercians in the 12th century. In the area affected by the earthquake there were settlements occupied various monastic orders, who had been endowed with numerous lands and farmhouses in the course of the 12th century. The main economic activity was farming, which was organised within the framework of monastic activities. We can deduce from indirect evidence that the earthquake intensified a process of decline at the monasteries in the

area between Cosenza and Paola, which had been heavily colonised in the early 11th century (Cilento 1981).

The transfer of the Cistercian monks of S.Maria Requisita from the Sambucina monastery, which had been reduced to ruins in the earthquake, to S.Maria della Matina, is considered to mark the beginning of the decline of the Cistercian order in Calabria (Cilento 1981). That the earthquake inflicted serious damage on monastic property is confirmed by the work of authoritative historians (Garufi 1908; Kehr 1902; Russo 1957), who suggest that the Cistercians in Calabria decided to transfer their economic activities to Sicily, where they founded new colonies near Paternò (province of Catania). The Sambucina monastery subsequently received papal grants which made its reconstruction and revival possible.

The primary sources for the earthquake consist of five royal and papal documents, as well two monastic chronicle sources. One document concerns the monastery of S.Maria di Valle Josaphat near San Lucido, while the other four concern S.Maria della Sambucina. Unfortunately the great collections of Greek documents, and especially 12th century diplomas, produced no information at all. But it must also be remembered both that the corpus of published documents relating to medieval Calabria is very small, and that it is very difficult to consult the unpublished sources, since they are scattered amongst private collections.

The first document from the chancery of William II, king of Naples, was drawn up at Messina and dated 2 April 1185 (ed. Garufi 1899, no.LXXXII, pp.200-2). It renews a privilege, previously granted by Roger II, which had been lost in the destruction of the monastery of S.Maria di Valle Josaphat in Calabria:

"William II by the grace of God king of Sicily, the Duchy of Apulia and the Principality of Capua. By means of this deed we make it known that brothers Elia and Stefano of the church of Josaphat have come to our Council at Messina. They have told us of the destruction of their House in Calabria in an earthquake. They have lost a certain privilege granted by the illustrious king Roger, our ancestor of happy memory, which they say gave their church its freedom. And they say that it gave them the right to satisfy the needs of the church of Josaphat by exporting goods from the port of Messina every year without paying duty or anchorage fees. And they forcefully pleaded with our elevated Authority because they had lost this privilege. We must therefore state that this original deed of ours is in support of the said church of Josaphat. And because they have been asked to satisfy our Assembly as to the truth of their account, they have brought witnesses [...]. Issued at Messina on the second day of the month of April [1185] in the third indiction".

W. dei gratia rex sicilie ducatus apulie et principatus capue. Per hoc presens scriptum notum facimus. Quod Helyas et Stephanus fratres ecclesie Iosaphat messanam ad nostram curiam venientes. Exposuerunt quod in ruina quam domus eorum de Calabria passa est ex terremoto. Amiserunt quoddam privilegium domini magnifici regis Rogerii avi nostri felicis memorie. Quod se habuisse dicebant de libertate ecclesie sue. Et de his que ad opus ecclesie Iosaphat a portu Messane sine aliqua datione et ancoratico annis singulis extrahebant. Et supplicaverunt attentius celsitudini nostre. Ut quia perdiderant privilegium ipsum. Autenticum scriptum nostrum inde ipsi ecclesie Iosaphat ad munimentum fieri fateremur. Et dum requisiti essent si de hoc quod proposuerant certificare possent curiam nostram [...]. Data Messane. Secundo die Mensis Aprilis tercie indictionis.

The second document, drawn up at Luzzi (province of Cosenza) and dated September 1196 (ed. Pratesi 1958, no.48, pp.112-5), is a deed of grant drawn up by the local feudal landlord, Goffredo of Carbonara, offering Abbot Luca and the monastery of S.Maria della Sambucina an estate adjoining land owned by the monastery, which had been founded by his ancestors:

"I, Goffredo of Carbonara, feudal lord of Luzzi [province of Cosenza], sign and confirm in my own hand.

In the name of God and our saviour Jesus Christ, in the year of the Incarnation 1197, in the month of September, in the fifteenth indiction [...] I, Goffredo of Carbonara, lord of Luzzi, having due regard for the religious work and good behaviour, in faithful observance of the regulations of the Cistercian order, at the monastery of S.Maria della Sambucina, which is known to have been founded by my ancestors, inspired by God, have thought it very fruitful and advantageous for my soul to proffer the hand of generosity, following the example of my ancestors, to meet the needs of the said monastery, and therefore, in the vicinity of the place where the basilica has been restored and where the whole monastery has been built to a more advantageous plan, I generously provide a suitable piece of land such as the true religion seeks for its own peace."

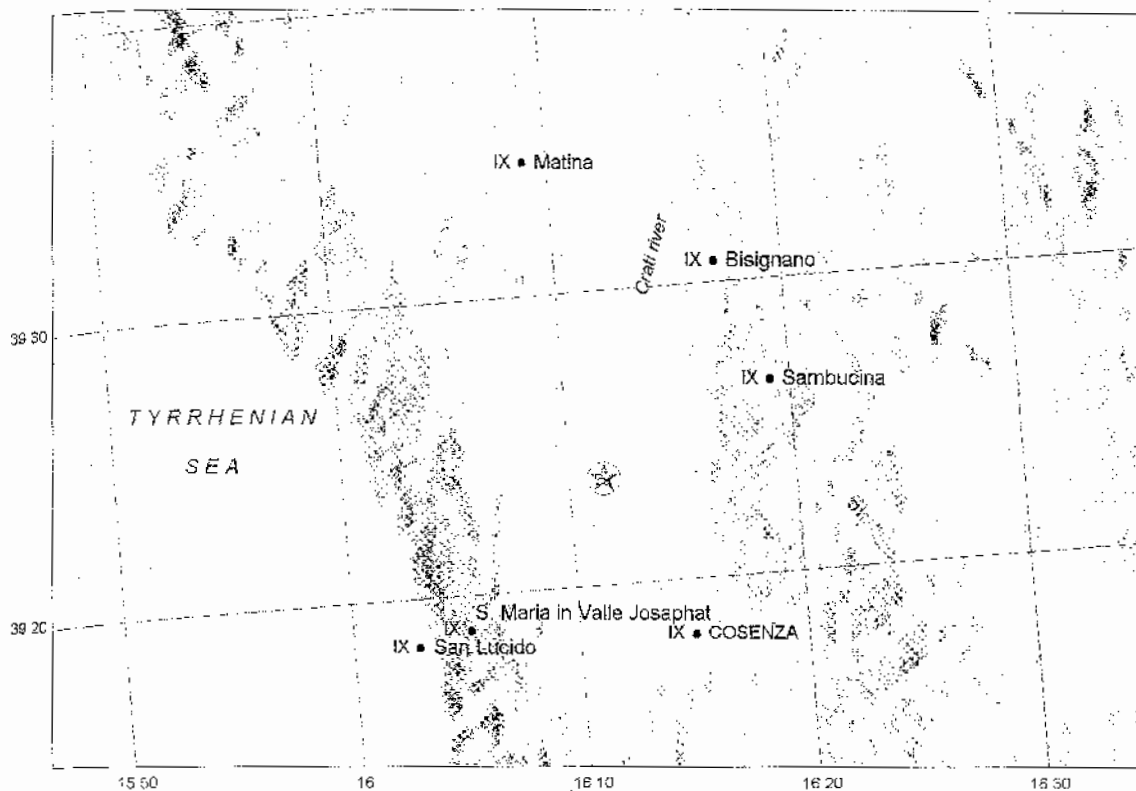
Ego Goffridus de Carbonara dominus Lucii signum propria manu facio et confirmo. In nomine Dei salvatoris nostri Iesu Christi. Anno incarnationis eius millesimo centesimo nonogesimo septimo, mense septembris, indictione XVa. [...] ego Goffridus de Carbonara dominus Lucii diligenter attenderem religionem et honestatem que in monasterio Sancte Marie de Sabucina, quod a progenitoribus meis fundatum esse dinoscitur, secundum sancta Cisterciensis ordinis instituta regulariter observatur, inspiratus a Deo salubre satis et fructuosum anime mee credidi si ad exemplar predecessorum meorum necessitatibus ipsius monasterii liberalitatis manus extenderem et in vicinitate loci quo basilica renovatur et totum monasterium consilio utiliori construitur largitatem aliquam apte possessionis iuxta quod vera religio in circuitu pro quiete habere desiderat, providerem.

The third document, drawn up in Rome and dated 29 October 1221 (ed. Pratesi 1958, no.127, pp.298-300), is a privilege granted by pope Honorius III for the transfer of the monastic community of Sambucina to the monastery of S.Maria della Matina in the diocese of San Marco Argentano (about twenty kilometres farther north). Of particular interest are the various aspects of the difficult environmental circumstances referred to. Although the document dates to forty years later, Cilento (1981) thinks the monks are referring to the 1184 earthquake, even though it is not explicitly mentioned:

"Bishop Honorius, servant of the servants of God. To our venerable brothers the archbishop of Cosenza and the bishop of San Marco [we give] apostolic blessing and [we wish them] good health. Beloved sons [...], since their monastery, which does not belong to the Church of Rome, stands on a subsidence-prone and otherwise unsuitable site, with the result that they cannot remain there in safety and comfort, the Cistercian abbot and community of Sambucina have humbly petitioned us to grant them permission to move to the monastery of Matina in the diocese of San Marco, which has been almost totally abandoned by its occupants and the order, and which they assure us belongs directly to the Church of Rome. Issued in the Lateran on the fourth day before the Calends of November [29 October] in the sixth year of our pontificate [1221]".

Honorius episcopus servus servorum Dei. Venerabilibus fratribus [...] Cusentino archiepiscopo et [...] episcopo Sancti Marci, salutem et apostolicam benedictionem. Dilecti filii [...] abbas et conventus Sambucine Cisterciensis ordinis nobis humiliter supplicarunt ut, cum monasterium eorum, quod ad Romanam Ecclesiam nullo pertinet mediante, situm sit in loco ruinoso et alias valde inepto, ita quod ibi nec secure nec comode possunt esse, ipsum ad monasterium de Matina diocesis sancti Marci personis et religione pene penitus destitutum, quod ad Romanam Ecclesiam immediate asserunt pertinere, daremus eis licentiam transferendi [...]. Data Laterani IIIJ kalendas novembris, pontificatus nostri anno sexto.

The fourth document, drawn up at Cassano allo Ionio (province of Cosenza) and dated February 1222 (ed. Pratesi 1958, no.128, pp.300-2), is a diploma issued by emperor



1184
May 24

0 15 km

fig. 47

Frederick II (1220-1250). It is similar to the preceding document, and also authorises the transfer of the monastic community of Sambucina to the monastery of S. Maria della Matina, because it is endangered by standing on land subject to earthquakes and landslides:

"Frederick II, by propitious divine mercy ever august emperor of the Romans and king of Sicily [...]. You, brother Bono, our venerable and faithful abbot of Sambucina, came before us and humbly and devotedly explained that the monastery of Sambucina, being built on land subject to shaking and landslides, is in danger of collapsing in ruins, and that the foundations of the said monastery are shaken because of the lack of solidity of the earth. Consequently, the labour and sacrifices which were devoted in many past times to building it, and are still required to maintain such a large construction, are to no avail because the defective ground weakens it".

Fridericus secundus divina favente clementia Romanorum imperator semper augustus et rex Sicilie [...] cum tu frater Bone, venerabilis abbas Sambucine fidelis noster, ad nostram presentiam accessisses exposuisti humiliter et devote quod monasterium Sambucine, tamquam in solo tremulo et labenti fundatum, casum minatur pariter et ruinam et ex terre natura labilis ut arena fundamenta sunt ipsius monasterii conquassata. Unde opus et impensa que tot retroactis temporibus in ipsius fuerant erectione consumpta et que etiam ad consumationem sunt tanti operis oportuna, ex operis infirmitate soli vicio contingente penitus deperduntur.

The fifth document, drawn up at Alatri (province of Frosinone) and dated 3 June 1222 (ed. Pratesi 1958, no.130, pp.305-7), is a privilege granted by pope Honorius III, confirming that the church of S. Maria della Matina is assigned to the abbot and community of Sambucina. Here, too, reference is made to landslides and earthquakes:

"Bishop Honorius, servant of the servants of God [...]. Since the monastery of

Sambucina stands on subsidence-prone land and is for other reasons extremely unsuitable and often shaken by earthquakes, it is understandable that in all honesty and religious spirit they have greater reason to fear losses than to hope for gains, and so it seems appropriate that since you would like out of prudence to transfer the monastery to another place and have humbly and devotedly petitioned us to that effect, we consider it right to grant permission to transfer the monastery to the church of S. Maria della Matina, which belongs to the Holy See".

Honorius episcopus servus servorum Dei [...]. Sane, cum monasterio Sambucine in loco ruinoso et alias valde inepto positum et nonnumquam terremotibus conquassatum, licet alias religione ac honestate polleret plus detrementi dispendia formidare quam sperare incrementi commoda videretur vos de translatione ipsius ad locum alium provide cogitantes supplicastis nobis humiliter et devote ut ecclesiam Sancte Marie de Matina immediate ad Sedem apostolicam pertinentem, que licet aliquando monasterium transferendi licentiam concedere dignaremur.

The most important and authoritative of the chronicle sources is the continuation of the 12th-13th century *Annales Casinenses*, a chronicle from the Benedictine monastery of Montecassino which has come down to us in two different versions. In the edition by Pertz (1866) for the *Monumenta Germaniae Historica*, one version derives from the codex given the number 3 and the other from codices 4 and 5. The version deriving from codices 4 and 5 was the only one in the 18th century editions published by Ughelli (1721) and Muratori (1724). Codex 3 simply places the earthquake in Calabria, a term which from the end of the 8th century onwards was used to indicate an area bounded by the valley of the river Crati in the north and the Straits of Messina in the south, whereas it had previously referred to southern *Apulia*. Codices 4 and 5 state that the earthquake occurred in the valley of the Crati and in the valley "de Sinu", which the historiographical tradition has mistakenly identified as the valley of the river Sinni (north of the Pollino mountains in present-day southern Basilicata). Our place-name research has shown that the ancient names of the river Sinni were "Siris" and "Semnus", which are not related to the root of "Sinus". The area referred to is therefore very likely to be the "Sinus Tarentinus" — that is to say, the modern Gulf of Taranto, where the river Crati reaches the sea. The two versions of the *Annales Casinenses* also differ in the details they supply about the death of archbishop Ruffo of Cosenza. Codices 4 and 5 mention the archbishop's death, but do not say where it occurred. The historiographical tradition interpreted this as meaning that he died at Cosenza; but codex 3 states that he perished in the ruins of the village of San Lucido. The following two passages from the *Annales Casinenses* are in the versions mentioned above. Codex 3:

"1184. In this year there was a powerful and terrible earthquake throughout Calabria, so that many churches collapsed killing many people, and the [archbishop] of Cosenza himself was crushed in the ruins of the walls of the village of San Lucido".

1184. Hoc anno vehemens et terribilis per totam Calabriam exitit terrae motus, ita etiam, quod multae ecclesiae cum multo populo corruerunt, et ipse Cusentinus in castello Sancti Lucidi sub murorum praecipitio suffocatus fuit.

Codices 4 and 5:

"1184. On the ninth day before the Calends of June [24 May], there was a great and terrible earthquake throughout Calabria, from the valley of the Crati to the valley of the Sinu. All the churches and masonry buildings collapsed, and archbishop Ruffo of Cosenza and many others were crushed in the ruins of the walls".

1184. 9 Kalendas Iunii terrae motus adeo magnus et terribilis fuit per totam Calabriam, valle de Crati et vallem de Sinu. Ecclesiae omnes et omnia aedificia murorum corruerunt, et Rufum Cusentinum archiepiscopum, et multos alios sub murorum praecipitio suffocati sunt.

The historian Marchese (1957, p.298) quotes the 1270 *Cronica Sambucinese* by a monk called Pietro Scasilio, which was formerly in the Ferraudo family archives at Acri (province of Cosenza). It refers to destruction at various places in the Crati valley. The text given by Marchese reads as follows:

"There was a dreadful earthquake in the valley of the Crati in the year 1184 on the ninth day before the Calends of June [24 May]; buildings collapsed at Sambucina and Matina, as well as churches at Cosenza and Bisignano, and a few members of our community perished as well as other local people".

Tremotus orribilis advenit in Valle de Ghrato anno millesimocentesimooctagintaquatuor nono Kal. Iulii; aedificia Sambuercinae, Mattinae et ecclesiae Cusentinae, Besidiensae precipitaverunt et suffucaverunt paucas communitates nostras et alteras gentes huinc.

▲ 1184 05 24 ☉ = 39 24 16 12 I₀ = IX Me = 6.0 Sites: 6

localities	lat.	long.	I	localities	lat.	long.	I
Bisignano	39 31	16 17	IX	Sambucina	39 27	16 19	IX
Cosenza	39 18	16 15	IX	San Lucido	39 18	16 03	IX
Matina	39 35	16 09	IX	S.Maria di M.Pers.	39 19	16 05	IX

< 094 > 1191 January 29 - 1192 January 17 [587 H.] Egypt

source 1 al-Maqrizi, *Kitab*, I/1, p.108

source 2 al-Suyuti, *Kashf*, p.45

catalogues d. *Ambraseys *et al.* (1994)

In the year of the Hegira 587 (= 29 January 1191 - 17 January 1192), there was an earthquake in Egypt, the effects of which are not recorded. The earthquake is mentioned only very briefly and is immediately followed by an equally brief reference to damage caused by strong winds. The sources for this event are very late: the principal one is the Cairo historian al-Maqrizi (1364-1442), whose report is repeated word-for-word by al-Suyuti. Al-Maqrizi write:

"There was an earthquake in Egypt and warm and harmful winds blew".

وحصلت بمصر زلزلة وهبت سموم حارة فيها.

Ambraseys *et al.* (1994, pp.36-7) think this is a very doubtful event, because of the lack of contemporary sources and the context in which it is recorded.

△ There are no elements with which to indicate the parameters.

< 095 > 1197 before July Constantinople [north-western Turkey]

inscription Janin (1964, p.281)

historiography Downey (1937, 1946); Müller-Wiener (1977)

This earthquake is unknown to the seismic catalogue tradition. It is recorded in an inscription which still exists and has been published in Janin (1964, p.281):

■ inscription on the Gate of Charisius (now Edirne kapi) at Constantinople, in the street leading from the church of the Holy Apostles (Müller-Wiener 1977, p.293), commemorates the reconstruction work carried out by the Emperor Alexius III Comnenus (1195-1203) and completed in July 1197. It reads as follows:

"Shaking, grinding, the weight of long years and unceasing cyclical movement, which bring about the destruction of everything corruptible, caused the complete collapse of

what stood here, destroying arcades, gates and well-constructed stone buildings. But the powerful lord of the land of the Ausonians, Alexius Comnenus, the pious sovereign, rebuilds it again and renders it superior, thus demonstrating who he is in what needs to be done. In the month of July, in the fifteenth indiction, in the year 6705 [1 September 1196 – 31 August 1197].

κλόνοι, σπαρογμοὶ καὶ φορὰ μακρῶν χρόνων / καὶ κυκλικὴ κίνησις ἀστρατουμένη, / ἀφ' ὧν φθορὰ πάρεστι τοῖς φθαρτοῖς ὅλοις, / πῶσιν παρέσχον ἀθρόαν τοῖς ἐνθάδε / στοὰς καταστρέψαντα καὶ πύλας ἅμα / κτίμασι λίθοις εὐφρυῶς ἠρμοσμένοις, / ἀλλ' ὁ κράτιστος ὁ κρατῶν γῆς Αὐσονῶν, / Κομνηνὸς Ἀλέξιος εὐσεβῆς ἀναξ, / αὐθις νεουργεῖ κάπῃ τὸ κρεῖττον φέρει / δεικνὺς ὁποῖός ἐστι ἐν τοῖς πρακτέοις. / (μηνί) 'Ιουλλ(ιῶ) ἰνδ(ικτιῶνος) ιε' ἔτει ςφε'.

The inscription clearly establishes the collapse of the Gate of Charisius, including the *stoai* (a term which covers both arcades and colonnades: see Downey 1937 and 1946). The first part of the inscription, taken together with the age of the building, indicates in a generic way that an earthquake was at least a concomitant cause.

▲ 1197 before 07

localities	lat.	long.	I
Istanbul	41 02	28 57	D (VI-VII)

< 096 > 1201 February 17 Constantinople [Turkey]

doubtful event

source Nic. Chon., *Hist.*, p.530.61-8

historiography Ducellier (1980)

catalogues d. Downey (1955); Grumel (1958)

Nicetas Choniates, a contemporary Byzantine historian, mentions a collapse and the opening up of a chasm at Constantinople when the Emperor Alexius III Comnenus (1195-1203), at the end of his campaign in Anatolia against Michael Ducas, disembarked at Constantinople shortly before dawn on 17 February 1201. When he arrived at his palace: "Now God demonstrated that he is the Lord of seasons and years [*Matthew* 24.36; *Acts* 1.7] and that he guides the steps of some or trips them up: the floor before the emperor's bed collapsed without visible cause and opened into a yawning chasm. Contrary to all expectations, the emperor was delivered from the danger, but one of his sons-in-law, Alexius Palaeologus, and many others fell through the opening and suffered grievous injury to their legs. A certain eunuch was killed as he fell to the very bottom of the gaping hole".

τοῦ θεοῦ δὲ δείκνυντος ὡς κύριός ἐστιν ὥρων καὶ χρόνων αὐτός, καὶ παρ' αὐτοῦ κατευθύνεται εἴτε μὴν συμποδίζεται τὰ τινων διαβήματα, τὸ πρὸ τῆς βασιλείου κλίνης δάπεδον αὐτομάτως ὑποχαλᾶ καὶ εἰς χάσμα ἰκανῶς διανοίγεται. καὶ βασιλεὺς μὲν παραδόξως τοῦ κινδύνου ῥύεται, ἄτερος δὲ τῶν τούτου γαμβρῶν, ὁ Παλαιολόγος Ἀλέξιος, καὶ συχνοὶ ἄλλοι ἐνίσχονται τῷ διαστήματι καὶ πάσχουσι κακῶς τὰ βάρηα τοῦ σώματος. εἰς δὲ τις ἐκτομίας καὶ ἐτεθνήκει ἐς τὸ βάθιστον τοῦ χάσματος καταδύς.

Downey (1955, p.600), Grumel (1958, p.480) and Ducellier (1980, p.106) think this was an earthquake which occurred at Constantinople on 1 March 1202, but Ducellier has doubts about the text. Since the text specifies that what happened was "without visible cause", it is doubtful whether this can be considered a genuine earthquake, since it lacks clear identification as such in the Byzantine sources. It may have been a building defect rather than a seismic event.

sources 1 Documents

Geoffrey of Donjon, *Letter*, June 1202 (in Mayer 1972, pp.306-8); Philip du Plessis, *Letter*, June 1202 (in Mayer 1972, pp.308-10); Marsilio Zorzi, *Letter*, October 1243, in Röhricht (1893, no.1114)

Annals and chronicles

Est. de Eracles, II, p.22; *Ann. Terre Sainte*, p.435; *Chron. Terre Sainte*, p.16; Rob. Aux., *Chron.*, pp.261-2; Ibn al-Lubad al-Bagdadi, *Mukhtasar*, pp.262-70; Ibn al-Athir, *al-Kamil*, XII, pp.130, 180-1; Sibṭ Ibn al-Jawzi, *Mir'at*, VIII, p.331; al-'Imad al-Isfahani, cit. in Sibṭ Ibn al-Jawzi, *Mir'at*, VIII, p.308, and in Abu Shama, *al-Dhayl*, fol.20; Ibn Munkala, *al-Ahkam*, fol.37; Ibn Wasil, *Mufarraj*, II, p.161; Ibn al-Wardi, *Tatimmat*, II, p.175; Abu 'l-Fida, *al-Mukhtasar*, III, p.106; al-Suyuti, *Kashf*, pp.48-9

sources 2

Mich. Syr. Cont., 15.7, *Chron.*, IV, p.586; Bar Hebr., *Chron.*, pp.406-7, 418; *Chron. min. Arm.*, II.2, p.61; *Vita Innoc. pap. III*, col.503; Ralph Cogg., *Chron.*, pp.141-2; Sicard, *Chron.*, col.619; *Breviar. Patriar.*, p.401; Vinc. Beauv., *Spec. hist.*, p.1209a; *Ann. Utic.*; Salimb. Adam, *Cron.*, p.23; Milioli, *Chron.*, p.654; Will. Nang., *Chron.*, p.750; Sanudo "Elder", *Liber*, III, 11, p.1; Ernoul, *Chron.*, XXXI; Pierozzi, *Chron.*, p.104; Fabri Felix, *Book*, ad ann. 1202; Amadi, *Chron.*, ad ann. 1202

historiography

Röhricht (1898); Elisséeff (1967); Mayer (1972); Duce'llier (1980)

literature

Taher (1979); Ambraseys and Melville (1988); Guidoboni and Traina (1996); Ambraseys and Jackson (1998); Ellenblum *et al.* (1998)

catalogues d.

Manetti (1457); Bonito (1691); von Hoff (1840); Perrey (1850); Mallet (1853); Sieberg (1932a); Grumel (1958); Step'anyan (1964); *Ben-Menahem (1979, 1991); *Ambraseys *et al.* (1994); Amiran *et al.* (1994)

catalogues p.

Poirier and Taher (1980); al-Hakcom (1988); Bektur and Alpay (1988)

catalogues l's

Ambraseys (1962); Antonopoulos (1980); Soloviev *et al.* (2000)

This is one of the strongest and best documented seismic events in the Mediterranean area, the most advanced historical and seismological study of which has been provided by Ambraseys and Melville (1988). Their study includes important Latin and Arabic published sources. In the brief survey provided below, we have added Marsilio Zorzi's letter to the corpus of known sources.

Effects of the earthquake

At dawn on 20 May 1202 (about 02:40 UT), there was a very destructive earthquake affecting the oriental Mediterranean coast and hinterland of what are now Lebanon, Syria and Israel. Within the territories then ruled by the Crusaders, the most seriously damaged towns were Acre (now Akko) and Tyre (or Sur). At Acre, the town walls, royal palace and some towers were very badly damaged; a great many houses collapsed, but those belonging to the Knights Templars were unharmed. There were many deaths, but no numbers are given. At Tyre, all the walls collapsed, except for the outer barbicans, all but three of the towers, and also churches and houses. There was a very high death toll. Funds were allocated for reconstruction work in both towns.

Inland, the towns of Baniyas and Safad (present-day Zefat) were partly destroyed. According to the sources, the only survivor at Safad was the governor's son. At Bayt Jinn, which stood on the road between Damascus and Baniyas, only the foundations of buildings remained; in many places, the town walls collapsed. There was also some destruction at Tibnin, as well as very extensive collapses in unidentified villages in the Hawrán region (east of Lake Tiberias). One village was reduced to ruins near Busra — perhaps because of a landslide. Farther south, Nabulus (Nablus) completely collapsed, except for one district, and there was slight damage at Jerusalem.

The worst damage in the County of Tripoli (or Tarabulus) was at the castle of Archis, where the walls, as well as towers and houses, almost completely collapsed. There was

serious damage at Gibelet (Jubayl) and many victims at Tripoli, but the sources are not in total agreement as to the extent of the damage there. At Baalbek, the citadel collapsed, in spite of its being a solid and stable construction. At Damascus, many houses collapsed, and there were many victims. The Umayyad mosque suffered damage in a number of places: the eastern minaret and 16 merlons collapsed, but the other minaret was simply damaged. The lead dome of the mausoleum of Nasr was damaged, and a large part of the Kallasa mosque collapsed, killing two people. The hospital of Nur al-Din also collapsed.

At Chastel Blanc (or Safita), most of the walls collapsed, and the main tower, although a well-built and solid structure, was seriously damaged and split open. The castle "Arsum" was also destroyed. It is difficult to ascribe a location to this castle, but Ambraseys and Melville (1988, p.191) suggest that it is to be identified with Arima (Qalat al-Uraymah), a few kilometres from Chastel Blanc. The castles of Crak des Chevaliers (or Hisn al-Akrad, present-day Qalat al-Hisn) and Margat (present-day Al-Marqab) were badly damaged, but remained capable of resisting any enemy attacks. The citadel at Hims was damaged, and its guard tower collapsed. The fortresses of Hamat and Ba'rin were damaged, in spite of their solid construction. The town of Tortosa (present-day Tartus) and its castle were slightly damaged.

Three strong shocks were felt in Cairo. Buildings and doors shook, while ceilings, floors and anything unstable or in an elevated position collapsed. The inhabitants awoke in terror and fled screaming. Elsewhere in Egypt, the earthquake was felt at Damietta, Alexandria and Qus. The earthquake also struck the island of Cyprus, but the exact effects there are not known. The earthquake had a vast propagation zone. It was felt at Aleppo and Antioch, at Akhlat (now Ahlat) and its province, at Mosul, and in the regions of Mesopotamia, Iraq, Azerbaijan and part of Anatolia.

There remain to be considered the puzzling references to Sicily and Sabta (i.e. Ceuta, a Moroccan town opposite Gibraltar), which appear in Ibn al-Athir and Ibn Wasil respectively. Ambraseys and Melville (1988) very cautiously include them amongst the localities and areas where the earthquake of 20 May 1202 was felt, pointing out that they are not mentioned anywhere else in western Arab sources, and that there are no other reports of effects at western Mediterranean locations. The problem is dealt with by Guidoboni and Traina (1996, pp.1216-9), who discuss the suggestion that, given their enormous distance from the epicentral area, the references to Sicily and Ceuta may concern separate earthquakes from that of 20 May 1202. The lack of other sources of information about effects in Sicily and Ceuta means that this problem remains unsolved.

The major earthquake at dawn on 20 May was followed by other brief shocks towards noon on the same day which were slightly felt in Cairo. This may be the same earthquake recorded as having been felt by everyone at Hamat; but we are told that the earthquake at Hamat occurred at midday on Tuesday 21 May and was followed by another shock in the afternoon. Altogether, the shocks lasted for four days.

The two Latin sources and the most important Arabic source to describe this earthquake agree as to the date. The letter from Geoffrey of Donjon and that from Philip du Plessis date it to Monday 20 May 1202; Ibn al-Lubad al-Bagdadi and the two letters he quotes date it to Monday 26 *Sha'ban* in the year of the Hegira 598, which corresponds to 21 May 1202, but that day was a Tuesday. This discrepancy of a day is something one sometimes finds in the conversion of dates from the Muslim calendar, but it proves to be negligible since Ibn al-Lubad al-Bagdadi himself also gives the date as 25 *Bashansh* [*Pachons*] in the Coptic calendar, a date which corresponds to 20 May. These two different traditions also agree in recording that the earthquake occurred at dawn or shortly before.

Environmental effects

Amongst the environmental effects of the earthquake, the sources mention a tsunami and substantial landslides and slips on the Lebanese mountains.

Tsunami

Gigantic waves rose up in the sea between Cyprus and the coast of Syria. The sea withdrew from the coast, ships were hurled on to the eastern coast of Cyprus, fish were thrown on to the shore, and lighthouses were damaged (see below Ibn al-Lubad al-Bagdadi, al-'Imad al-Isfahani and Ibn Munkala).

Landslides

About 200 people from Baalbek, who had gone out to gather wild fruit, were killed in landslides from two mountains in the Lebanese range between the Bekaa valley and the Mediterranean coast (see below Ibn al-Lubad al-Bagdadi). One village was reduced to ruins near Busra (now Busra ash Sham] — perhaps because of a landslide.

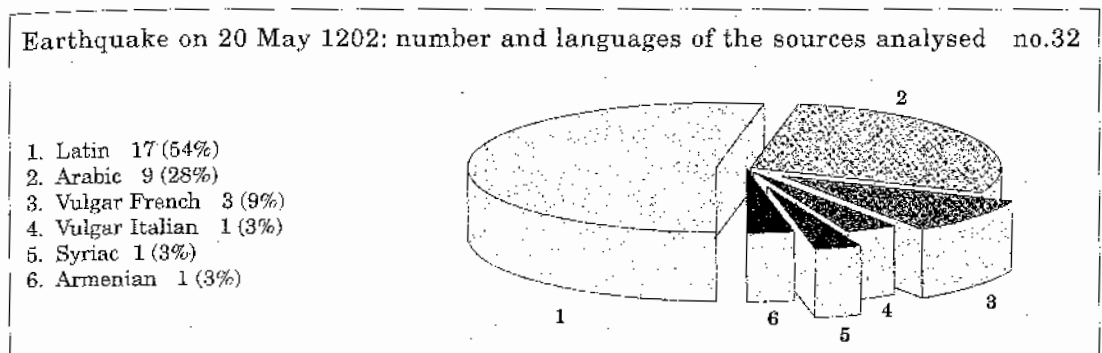


fig. 48

Historical sources: an overall view

The earthquake occurred in the period between the Third and Fourth Crusades. As in the case of the earthquake of 29 June 1170, the Latin and Arabic sources — which are the two main and independent traditions concerned — deal almost exclusively with the lands under their respective control, each adding to the information provided by the other. Much briefer reports also appear in Vulgar French, Syriac and Armenian sources, which largely reflect those in Latin and Arabic. Of the Latin sources, the most important are of two letters written respectively by Geoffrey of Donjon, Grand Master of the Order of Knights Hospitallers, to king Sancho VII of Navarre (1194-1234), and by Philip du Plessis, Grand Master of the Knights Templars, to Arnold I, abbot of Cîteaux. Both letters were written in June 1202, that is to say shortly after the earthquake, and have been published in Mayer (1972, pp.306-8, 308-10). There may also be some information of the 1202 earthquake in a letter dating to 1243 (Röhricht 1893, no.1114), from Marsilio Zorzi, Venetian ambassador (*bailo*) for Syria, in which he refers to a group of properties in the city of Tyre, some of which had been destroyed in an earthquake. The report in the *Chronicon* of Robert of Auxerre, a contemporary monk and writer who died in 1212, derives in large part from the letter from Philip du Plessis, as Mayer (1972) has shown. The other Latin sources are much briefer than the above and are expressed in more general terms, so we list only those which date to the mid or late 13th century (sources 2): *Annales Uticenses* from the abbey of St.Evrault d'Ouche, which were compiled by various hands from 1098 onwards (the earthquake is wrongly dated to 1203); chronicle of Ralph of Coggeshall, a Cistercian monk who died in 1228; *Speculum Maius* of Vincent of Beauvais; *Cronica* of Salimbene de Adam; *Cronica Imperatorum* of Alberto Milioli; *Chronicon* of William of Nangis. Of the Vulgar French sources, the 13th century *Estorie de Eracles Empeireur* states that part of the funds collected for the Fourth Crusade could be used for rebuilding the walls

of Acre and Tyre. The *Annales de Terre Sainte* and the early 14th century *Chronique de Terre Sainte*, though providing information in very summary form, mention Gibelet, which is not named by any of the other sources. As far as Arabic sources are concerned, the most informative is Ibn al-Lubad al-Bagdadi. What he tells us is particularly important, because he not only records effects at Cairo, in Egypt generally and elsewhere, but also transcribes two letters from Hamat and Damascus, thereby providing a reliable and detailed picture of the earthquake. When the earthquake struck, he was in Cairo, and his work was written two years later, in May 1204. In other contemporary Arabic sources (the Mosul historian Ibn al-Athir and Sibte Ibn al-Jawzi, who lived at Damascus), or later 13th and 14th century sources (the Damascene historian and textual scholar Abu Shama, the historian Ibn Wasil, and the Syrian historians Abu 'l-Fida and Ibn al-Wardi, who are briefer than Ibn al-Lubad al-Bagdadi), the earthquake is dated to the month of *Shaban* in the year 597 of the Hegira, which corresponds to the period 7 May – 4 June 1201. In some cases these writers record earthquakes in the year 598 of the Hegira, or even 600 (Ibn al-Athir). However, as Ambraseys and Melville (1988, pp.185-7) have suggested in their discussion of the sources and problems of chronology involved in the study of the earthquake, since the more reliable Latin and Arabic sources only refer to one earthquake, it is reasonable to suppose that the other datings in the Arabic sources are all duplications of an earthquake which actually occurred on 20 May 1202.

Latin sources

ARCHIVAL DOCUMENTS

The letter from Geoffrey of Donjon (June 1202) provides the most detailed information: "While all things lay in silence and the night proceeded on its course', on the twentieth day of May, to which is given the name of the moon [i.e. Monday], at the hour when sleep caresses tired eyes, shortly before dawn, the wrath of God rose up against us and 'there was a great earthquake'. Of the towns and castles in the East, whether belonging to pagans or Christians, some were annihilated, some destroyed and some risked being reduced to ruins because of the damage inflicted by the strong earthquake. The city of Acre, which is a very convenient port, has suffered incredible and devastating damage to its towers, to the royal palace and to the walls with which it was protected, while countless houses have been reduced to ruins, and the death of rich and poor is unbearable to speak of. Alas! Tyre, 'the city of strength', the refuge of Christianity, which ever 'freed the oppressed from the hands of the enemy', has suffered such damage to its walls, towers, churches and houses, that no man alive today can hope to see their restoration complete during his lifetime. What can we write about the death of the people of this town, for death has taken them without number in the ruins of their homes. This affliction, this catastrophe to be wept over above all others, and this dreadful event have added terror to our fear. The city of Tripoli, resplendent with its walls and houses, has been gravely weakened by the great number of victims, and yet it has suffered less damage than other towns. At Archis, towers, walls, houses and town walls have been reduced to ruins, and places which have been left deserted because their inhabitants have been killed, look as though they had never been inhabited. Our castles of Cratum [Crak des Chevaliers] and Margat have suffered much damage, but nevertheless still have little to fear from enemy attacks, if they are spared greater shaking by the will of God. Antioch and the lands of Armenia, although struck by the earthquake, have not suffered too serious damage amidst all these dreadful events. Pagan towns and their people bemoan the incurable wounds that they have suffered through the blows of implacable fate. And while our hearts are afflicted by this deep grief, the great lack of food and a deadly pestilence which has struck animals cause further suffering for those Christians who have survived. We have decided to report to the charitable ears of Your Majesty that when our crops were still young, we

had the expectation of an abundant harvest. But as the ears were sprouting, there came on the day of St. George a fog which rendered vain all our hopes of gathering in the crop, because it made everything rot, with the result that the desolate earth is now trodden by a mass of the poor and a crowd of beggars. And so, O 'Lord of Virtues', most excellent sovereign, may the Earth, which saw the Birth of our Lord but now lies grief and poverty stricken, desolated and almost annihilated by this disaster, breathe again thanks to your clemency, and be consoled by your advice".

Dum medium silentium tenerent omnia et nox in suo cursu iter perageret, vicesimo die stantis maii, cui nomen lune est impositum, in hora, qua defessis sopor blanditur oculis, paulum ante diluculum ira dei in nos est asperata, 'terremotus factus est magnus'. Civitatum et castrorum Orientis tam paganismi quam christianitatis pars est eversa, pars destructa, pars propter nimie excussionis lesionem adhuc minatur ruinam. Civitas Aconensis, que portus est oportunitatis, in parte turrium, regalis etiam palatii et murorum, quibus fuit palliata, in ruina domorum innumerabili, in morte divitum et pauperum ineffabili miram et exitialem passa est lesionem. O dolenda res! Tirus, 'urbs fortitudinis', refugium christianitatis, que semper oppressos 'de manu inimicorum liberavit', in muris et turribus, ecclesiis et domibus tantam passa est eversionem, ut nullus hominum iam vivens eius possit expectare vivendo restauracionem. Quid de morte hominum eiusdem civitatis scriberemus, cum in ruina domorum mors eos sine numero apprehendisset. Hic dolor, hoc exitium pre ceteris gemebundum et hic eventus infortunatus timori nostro tremorem sociarunt. Tripolitana civitas splendidissima in muris et domibus, in morte populi graviter corrupta, minorem ceteris passa est lesionem. Archay turres, muri, domus et menia funditus eversa, populi interempti loca deserta testantur numquam se habuisse habitatorem. Castra nostra Cratum et Margatum plurima gravata insultus tamen hostium adhuc parvipendunt, si sine maiore conserventur divinitus quassacione. Antiochia et partes Armenie terremotu concusse non multam, non lamentabilem in tantis lugendis passe sunt corrupcionem. Paganismi civitates et populi inmemorate sortis dispendio insanabilia se recepisse vulnera conqueruntur. Presertim cum in plerisque doloribus corda nostra sint afflicta, caritas inmensa victualium, letalis pestis animalium residue christianitati universaliter dolor est specialis. Sane tamen caritatis dominacionis vestre auribus duximus disserendam, dum messis nostra fuisset in herba, frugum ubertatem nobis se monstrabat reddituram. Set postmodum spicis pullulantibus in festo beati Georgii supervenit nebula, qua spes nostra in metendis segetibus pro earum corrupcione penitus fuit exinanita, unde pauperum nimietas, mendicorum affluentia terram premit desolatam. Igitur 'domine virtutum', rex excellentissime, Terra Dominice Nativitatis sedens in dolore et miseriis, iam fere kalamitatibus extincta, vestra respiret clementia, vestro consilio consoletur desolata.

In his letter (June 1202) to Arnold I, abbot of Cîteaux, Philip du Plessis recalls two earlier "scourges", in the form of military encounters in the Tripoli area and the adverse weather conditions which had severely affected the grain harvest, and he then goes on to describe the disastrous effects of the earthquake; and he ends by pointing out that a third of those who survived the earthquake died in an epidemic:

"To the venerable father and dearest friend by the grace of God abbot of Cîteaux and of the whole Order [...]. The third scourge proved more catastrophic and terrible than the others; for on the twentieth day of May, at dawn, a terrifying voice was heard from heaven and dreadful rumblings rose from the earth, and there were earthquakes such as had not been seen since the creation of the world; and they razed most of the walls and houses at Acre to the ground, crushing a great many people to death in the ruins. But divine mercy willed that our houses should remain undamaged. At the city of Tyre, all but three of its towers were destroyed, and all the city walls except for the outer barbicans, and all the houses with their inhabitants, except for a few survivors. Most of the city of Tripoli was destroyed, along with a large proportion of the townspeople. The castle

of Archis has been reduced to ruins, including all its houses, walls and towers, and the castle of Arsum [Arima] has been razed to the ground. At Chastel Blanc, most of the walls collapsed, and the main tower, which we thought to have been built with outstanding strength and solidity, was so badly cracked and damaged that it would have been better for us if it had completely collapsed instead of being left standing in such a state. Divine mercy spared the town of Tortosa and its castle, the walls, the inhabitants, and everything else. The fourth scourge with which we are afflicted is that, in addition to the disasters we have mentioned, the corruption of the air has caused such high mortality that almost a third of those who survived the earthquake have died, and those who were able to rise from their beds after such prolonged enfeeblement were barely alive. And since we are weighed down by all these disasters and calamities, we need your prayers to overcome them, and we firmly trust in God that we shall obtain them”.

Venerabili patri et amico karissimo dei gratia Cisterciensi abbati totique conventui ordinis [...]. Tertia vero ceteris flebilior et horribilior talis fuit, quod vicesima die maii summo diluculo audita est vox terribilis de coelo, mugitus horribilis de terra, et terremotus, quales non fuerunt ab initio mundi, facti sunt, ita quod partem maximam Accaron in muris et domibus ad terram prostraverunt et gentem innumerabilem occupatam occiderunt. Domus autem nostras divina misericordia nobis integras resevavit. Civitatis vero Tyri omnes turres exceptis tribus et muri excepta exteriora barbicana et omnes domus cum plebe sua paucis reservatis in terram corruerunt. Civitatis vero Trypolis maxima pars cecidit et magnam plebem occupavit. Castrum vero Archados cum omnibus domibus suis et muris et turribus in terram prostratum est et castrum Arsum funditus corruit. Castri autem Albi maxima pars murorum cecidit, turris autem maior, qua nullam credimus fortius vel firmitus aedificatam, in hoc rimis et quassaturis debilitata est, quod melius nobis esset, si funditus corrueret, quam ita stans permaneret. Civitatem vero Tortose et castrum cum turribus et muris et plebe et omnibus divina misericordia reservavit. Quarta autem pestilentia fuit, quod tanta mortalitas ex corruptione aeris pestes priores secuta est, quod fere tertia pars eorum, qui de terremotu evaserunt, defuncta est et vix invenitur vivus, qui longi languoris lectum evadere potuisset. Et quum tantis miseriis et calamitatibus opprimamur, necesse est nobis, ut vestris orationibus, de quibus plurimum in domino confidimus, de miseriis predictis resurgamus.

It is reasonable to suppose that there is a reference to damage caused by the 1202 earthquake in a letter written in October 1243 by Marsilio Zorzi, who was the Venetian ambassador for Syria (in Röhricht 1893, no.1114). After recounting how he and other noblemen in Syria had gained control of the city of Tyre, Zorzi enumerates the benefits and privileges enjoyed by the Venetians in the city, including the estates of the church of St. Mark, consisting of a series of properties in Tyre and its surroundings. Of some of these — all inside the city — he says that they had been destroyed in an earthquake, which he does not identify. He mentions three bakeries, an unspecified number of houses and a tower house:

“[...] another bakery, which belonged to the Veneto community, but has now been destroyed in an earthquake; another bakery of that community, now destroyed in the earthquake; and another bakery, situated on the public street towards the east, also destroyed in the earthquake; a piece of land, whose houses have now been destroyed in the earthquake, towards the north, by the city walls; and a house, similar in form to a tower, which stood on the street, but has now been destroyed in the earthquake”.

[...] alter furnus, qui fuit communis Venetorum sed nunc terrae motus destructus iacet; alius furnus communis terrae motus destructus; alius furnus, terrae motus destructus, qui firmat in orientem in via publica; petia terae, cuius domus nunc terrae motus destructae firmant versus septentrionem in murum civitatis; domus quasi turris, quae est super viam, sed nunc terrae motus destructa est.

Two more houses, a warehouse and a mill are mentioned in the same letter as having been destroyed (*destructi*), but the cause of the damage is not specified. We have not set out the text of Robert of Auxerre, because it depends largely on the letter from Philip du Plessis as already pointed out.

Vulgar French sources

ANNALS AND CHRONICLES

The *Estorie de Eracles Empereur* tells how Fulk of Neuilly (d. 1202), a country parish priest from near Paris and preacher of the Fourth Crusade (1202-1204), had been making use of the Order of Cistercians since 1198 to gather funds for the new crusade to the Holy Land, on the instructions of pope Innocent III (1198-1216). In particular, we are told that:

"the funds entrusted to Cîteaux [the mother house of the Cistercians], were taken to the Holy Land, and there was never a better arrangement than that made by master Fulk at Cîteaux, for there had been earthquakes [in the Holy Land]; if the walls of Tyre and Acre were rebuilt, it should be done with some of those funds".

Li avoires, qui fu comandé a Cisteaus, fu portez Outre mer, ne onques avoir ne vint a si bon point come celui qui maistre Foque avoit a Cisteaus, car li crolles avoit esté en la terre; si estoient fondu li mur de Sur et d'Acre que l'en refist toz d'une partie de cel avoir.

In the *Annales de Terre Sainte*, we read:

"In the year 1202, there was an earthquake which destroyed Acre, Tyre, Gibelet and Archis, and part of Tripoli; and many Christian and Saracen towns were reduced to ruins".

A. mil et CC et II, fu le crosle qui abati Acre, Sur, Gibelet et Arces et une partie de Triples; et chairent plusieurs chites des Crestiens et des Saracins.

Very similar words are to be found in the *Chronique de Terre Sainte*.

Arabic sources

CHRONICLES

In Ibn al-Lubad al-Bagdadi's long text, we read as follows:

"At dawn on Monday 26 *Sha'ban*, which corresponds to 25 *bashansh* [*Pachons* in the Coptic calendar], there was a tremendous earthquake; people leapt from their beds in panic, screaming in terror and calling on God to help them. The earthquake lasted for a long time: its movement was like that of a sieve or the beating of a bird's wings. There were three violent shocks, which caused buildings and doors to shake, while ceilings, floors and anything unstable or in an elevated position collapsed. The shocks started again at midday, but few people were aware of them because they were weak and brief. That night, the cold was so intense that it was necessary to cover oneself, but the next day the hot *samun* wind blew so much that the air became unbreathable. Rarely had there been such strong earthquakes in Egypt. Later on, news spread that the same earthquake had struck distant regions at the same time as here. I learned that the earth had shaken at Qus, Damietta and Alexandria. Many places were destroyed so completely that no trace of them was left, and there were many victims. I heard of one town in as strong a position as Jerusalem, and yet it suffered unexpected damage. However, the damage suffered by the Franks in the earthquake was greater than that in Muslim lands. We learned that the earthquake reached as far as the town of Akhlut and its province on the one hand and the island of Cyprus on the other. The sea became extremely wild, causing serious damage to lighthouses. In certain places, the waters divided and waves rose up like mountains, hurling boats on to the land, and throwing fish on to the shore. Then messages came from Syria about the earthquake.

Set out below are two letters, from Damascus and Hamat. Letter from Hamat: 'On Monday 26 *Sha'ban* the earth began to shake as though it were beginning to walk; the mountains swayed, and everyone thought the day of Judgement had come. There were two shocks: the first lasted for about an hour, whereas the second was briefer but stronger. Some fortresses felt the effects of the earthquake, especially the fortress of Hamat, in spite of the good quality of its construction, and then that of Ba'rin, in spite of its solid architecture, and that of Ba'labak [Baalbek], in spite of its solidity. We have not heard any details of more distant regions and fortresses. On Tuesday 27, at the time of midday prayer, there was a violent earthquake which was felt by everybody, whether they were awake or asleep, and whether they were standing or sitting down. On the same day, there was [another shock] at the time of afternoon prayer. News came from Damascus that the earthquake had destroyed the eastern minaret of the [Umayyad] mosque, a large part of the Kallasa and the whole hospital [of Nur al-Din]; many houses collapsed on top of their inhabitants, killing large numbers of them'.

Letter from Damascus:

'Your servant reports on the earthquake which occurred on Monday 26 *Sha'ban* at dawn, and lasted for a long time. Some witnesses say it lasted as long as it takes to read the *sura* of The Cave; some other elderly people of Damascus maintain that they have never seen anything like it in their lives. The damage includes the collapse of sixteen merlons and a minaret (the other was only damaged) at the [Umayyad] mosque, and of the lead dome of the mausoleum of Nasr. The Kallasa collapsed, killing two men. There was another victim at Bab Jayrun. Furthermore, the [Umayyad] mosque was damaged in many places, and a large number of houses have collapsed everywhere. In Muslim regions, they say that Baniyas has partly collapsed, and also Safad, where the only survivor is the son of the governor. There has been destruction at Tibnin, and at Nabulus, where not a single wall has remained standing, except in the Samra district. According to reports, Jerusalem has been left undamaged, thanks be to God. At Bayt Jinn, foundations and walls are left, although the latter have collapsed in many places. Similar collapses have occurred in the region of Hawran, to the extent that it is impossible to make out the old form of its villages. They also say that most of Acre has collapsed, and that a third of Tyre has been destroyed. 'Araqa and Safita are also in ruins. On the mountains of Lebanon, a group of people had gone out to collect wild fruit and two mountains closed over them, killing about two hundred. In reporting what happened, some have exaggerated the number of victims. The earthquake lasted for four days. Then our prayers were answered by God, our protector and saviour'.

واتفق السحرة يوم الاثنين السادس والعشرين من شعبان وهو الخامس والعشرون من بشنش أن حدثت زلزلة عظيمة اضطرب لها الناس فهبوا من مخاضهم مدهوشين وضجوا إلى الله سبحانه وليت مدة طويلة وكانت حركتها كالغريلة أو كخفق جناح الطائر وانقضت على ثلاث رجفات قوية ماتت بها الأبنية واصطفقت الأبواب وصرصرت السقوف والأخشاب وتداعى من الأبنية ما كان وأهيا أو مشرفا عاليا. ثم عاودت في نصف النهار الاثنين إلى أنها لم يحس بها أكثر الناس لخفائها وقصر زمانها وكان في هذه الليلة برد شديد يحوج إلى دثار خلاف العادة وفي نهار ذلك اليوم تبدل بحر شديد وسوم مفرط يضيق الأنفاس ويأخذ بالكظم وقلما تحدث زلزلة بمصر بهذه القوة. ثم أخذت الأخبار تتواتر بحدوث الزلزلة في النواحي النائية والبلاد النازحة في تلك الساعة بعينها والذي صح عندي أنها حركت في ساعة واحدة طائفة من الأرض من قوص إلى دمياط والاسكندرية ثم بلاد كثيرة بحيث لم يبق لها أثر وهلك من الناس خلق عظيم وأمم لا تحصى ولا اعرف في الشام بلدا أحسن سلامة من القدس فانها لم تنك فيه إلا ما لا بال به وكانت نكاية الزلزلة ببلاد الافرنج أكثر منها في بلاد الاسلام كثيرا. وسمعنا أن الزلزلة وصلت إلى أخلاط وتخوسها وإلى جزيرة قبرس وأن البحر ارتطم وتزوج وتشوهت مناظره فانفرد في مواضع وصارت فرقة كالأطواد وعادت المراكب على الأرض وقذف سمكا كثيرا على ساحله. ثم وردت كتب من الشام ومن دمشق وحماة تتضمن خبر الزلزلة ومما اتصل من ذلك كتابان أوردتهما بلفظهما. نسخة الكتاب الوارد من حماة: ولما كان سحرة الاثنين السادس والعشرين من شعبان حدثت زلزلة كادت

الأرض تسير سيرا والجبال تمور مورا وما ظن احد من الخلق إلا أنها زلزلة الساعة وأتت دفعتين في ذلك الوقت أما الدفعة الأولى فاستمرت مقدار ساعة او تزيد عليها وأما الثانية فكانت دونها ولكن أشد منها وتأثر منها بعض القلاع فأولها قلعة حماة مع اتقانها وعمارتها وبارين مع اكتنازها ولطافتها وبعلمك مع قوتها ووثاقتها ولم يرد عن البلاد الشاسعة والقلاع النازحة إلى الآن ما أذكره. ثم حدثت في يوم الثلاثاء السابع والعشرين منه عند صلاة الظهر زلزلة استوى في عملها اليقظان والنائم وتزعزع لها القاعد والقائم ثم حدثت في هذا اليوم أيضا وقت صلاة العصر ووصل الخبر من دمشق بأن الزلزلة أفسدت فيها منارة الجامع الشرقية وأكثر الكلاسة والبيمارستان جميعه وعدة مساكن تساقطت على أهلها وهلكوا. نسخة الكتاب الوارد من دمشق: حدوث زلزلة ليلة الاثنين سادس وعشرين شعبان وقت انفجار الفجر وأقامت مدة قال بعض الأصحاب إنها مقدار ما قرأ سورة الكهف وذكر بعض المشايخ بدمشق أنه لم يشاهد مثلها فيما تقدم وما أثرت في البلد سقوط ست عشرة شرفة من الجامع وإحدى المآذن وتشقق أخرى وقبة الرصاص يعني النصر وانخساف الكلاسة ومات فيها رجلان ورجل آخر على باب جبرون وتشقق بالجامع مواضع كثيرة وسقط بالبلد عدة أدوار. وذكر عن بلاد المسلمين أن بانياس سقط بعضها وصند كذلك ولم يبق بها إلا من هلك سوى ولد صاحبها وكذلك تبنين ونابلس ولم يبق بها جدار قائم سوى حارة السمرة ويذكر أن القدس سالم والحمد لله. وأما بيت جن فلم يبق منه إلا الأساس والجدران إلا وقد أتى عليه الخسف وكذلك أكثر بلاد حوران غارت ولم يعرف لبلد منها موضع يقال فيه هذه القرية الفلانية ويقال إن عكة سقط أكثرها وصور ثلثها وعرة خسف بها وكذلك صافيا. وأما جبل لبنان فهو موضع يدخل الناس اليه بين جبلين يجمع منه الريباس الأخضر فيقال إن الجبلين انطبقتا على من بينهما وكانت عدتهم تناهز مائتي رجل وقد أكثر الناس في حديثها. وأقامت بعد ذلك أربعة أيام تحدث في النهار والليل وتسال الله لطفه وتديبره وهو حسبنا ونعم الوكيل.

The other 13th century or later Arabic sources are much briefer, and only in a few cases do they add information to what we find in Ibn al-Lubad al-Bagdadi. As we have already pointed out, moreover, some of these authors pre- or post-date the earthquake, or else create a doublet. Ibn al-Athir records two earthquakes in Egypt and Syria, dating them to the years 597 and 600 of the Hegira; but we are in fact almost certainly dealing with a single event which other Arabic sources date to the year 598 of the Hegira (= 1202):

"In the month of *Sha'ban* in that year [597 H. = 7 May - 4 June 1201], the earth shook at Mawsil, everywhere in Mesopotamia, in Syria, in Egypt and elsewhere. In Syria, the effects were dreadful: many houses were destroyed at Damascus, Hims and Hamat, and a village near Busra was swallowed up by the earth. There was also massive damage along the Syrian coast: the citadels of Tripoli, Sur, Acre and Nablus were destroyed. The earthquake also reached Byzantine territory. In Iraq, the damage was slight.

في شعبان منها تزلزلت الأرض بالموصل وديار الجزيرة كلها والشام ومصر وغيرها فأثرت في الشام آثار قبيحة وخربت كثيرا من الدور بدمشق وحمص وحماة وأنخسفت قرية من قرى بصرى وأثرت في الساحل الشامي أثرا كثيرا فاستولى الخراب على طرابلس وصور وعكا ونابلس وغيرها من القلاع ووصلت الزلزلة إلى بلاد الروم وكانت بالعراق يسير لم تهدم دور.

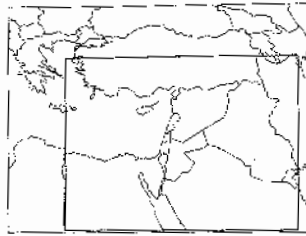
The second reference reads:

"In that year [600 H.], a terrible earthquake struck a large part of the territories of Egypt, Syria, Mesopotamia and Byzantium. It reached Sicily, Cyprus, Mawsil and Iraq. The walls of the city of Tyre were destroyed, and the earthquake caused damage throughout Syria".

وفيهما كانت زلزلة عظيمة عمت أكثر بلاد مصر والشام والجزيرة وبلاد الروم وصقلية وقبرس ووصلت إلى الموصل والعراق وغيرها وخرب من مدينة صور سورها وأثرت في كثير من الشام.

Sibt Ibn al-Jawzi's narrative is as follows:

"In the month of *Sha'ban*, there was a violent earthquake which caused destruction in



1202
May 20

0 300 km

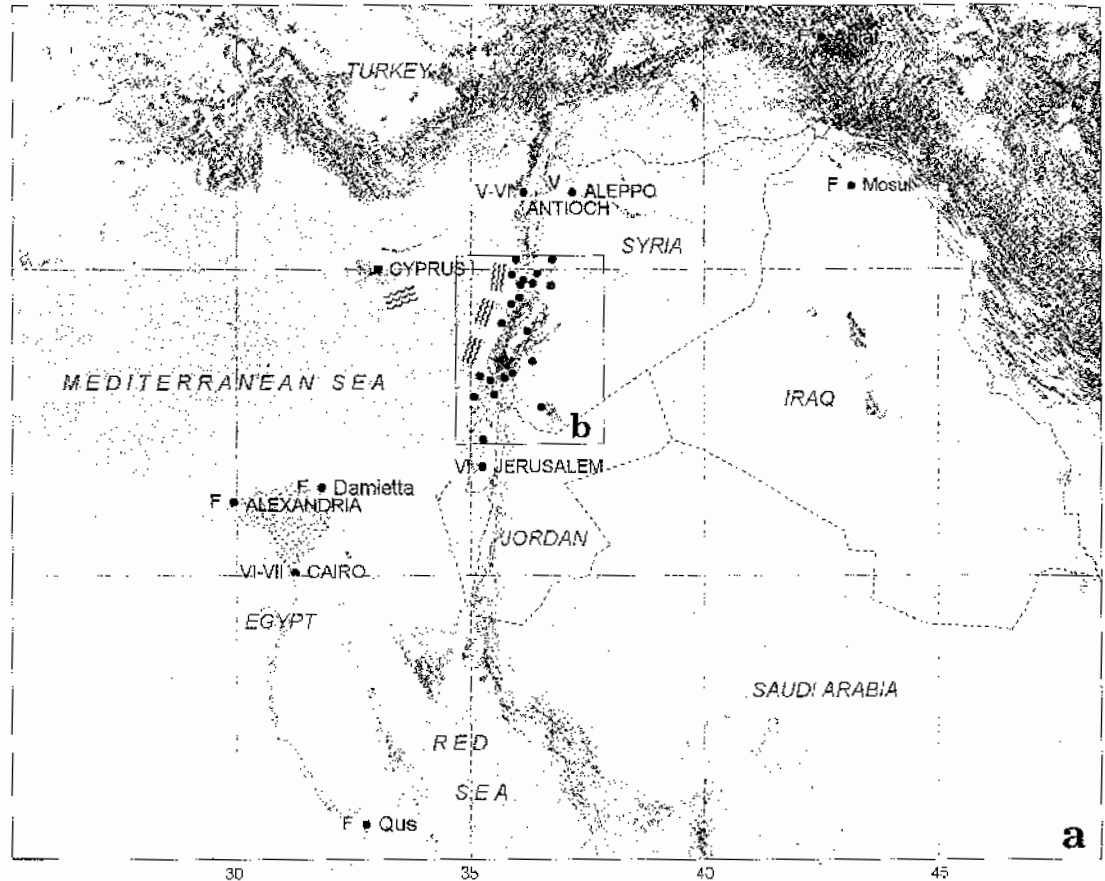


fig. 49a

the citadel at Hims and the collapse of its guard tower; Hisn al-Akrad was destroyed. The earthquake also struck the island of Cyprus, and reached as far as Nablus, destroying that region. This tremendous earthquake caused destruction in all the northern Muslim countries. At Damascus, it caused the collapse of the tops of the minarets in the mosque [the Great Umayyad Mosque], as well as some merlons on the north side. A man from the Maghreb was killed at the Kallasa lime kilns; and a Turk also died: the slave of a money changer who lived in the Sumaysat district. It happened at dawn on Monday 26 *Sha'ban*, which corresponds to 20 *Ab* [August in the Syriac calendar]. The next morning there was a weak shock".

وجاءت في شعبان زلزلة عظيمة فشقت قلعة حمص ورمت النظرة التي العظمى التي هدمت البلاد على القلعة وأخربت حصن الأكراد وتعدت إلى جزيرة قبرص وامتدت هذه الزلزلة إلى نابلس فأخربت ما بقي. الإسلامية الشمالية ورمت بدمشق رؤوس منائر الجامع وبعض شواريفه من شماله فقتلت رجلا مغربيا بالكلاسة ومملوكا تركيا لرجل صيرني ساكن في درب السمساطي عند تنفس الصباح من يوم الاثنين السادس والعشرين من شعبان الموافق العشرين من آب وأعقبها زلزلة خفيفة في ضوة الغد.

Abu Shama, *al-Dhayl 'ala al-Rawdatayn*, fol. 20] reports that:

"In the month of *Sha'ban*, there was a tremendous earthquake [which came?] from Upper Egypt. For an hour, the ground was like the sea; the towns of Baniyan, in Egypt, and Nablus were destroyed, and many people perished in the ruins. Then the earthquake reached Syria and its coast; at Nablus not so much as a wall was left standing, except in the Samra district, and there were 30,000 victims. Acre and Sur were destroyed, as well as all the citadels along the coast. The earthquake reached Damascus: part of the east minaret of the [Great Umayyad] mosque collapsed. There was massive damage to

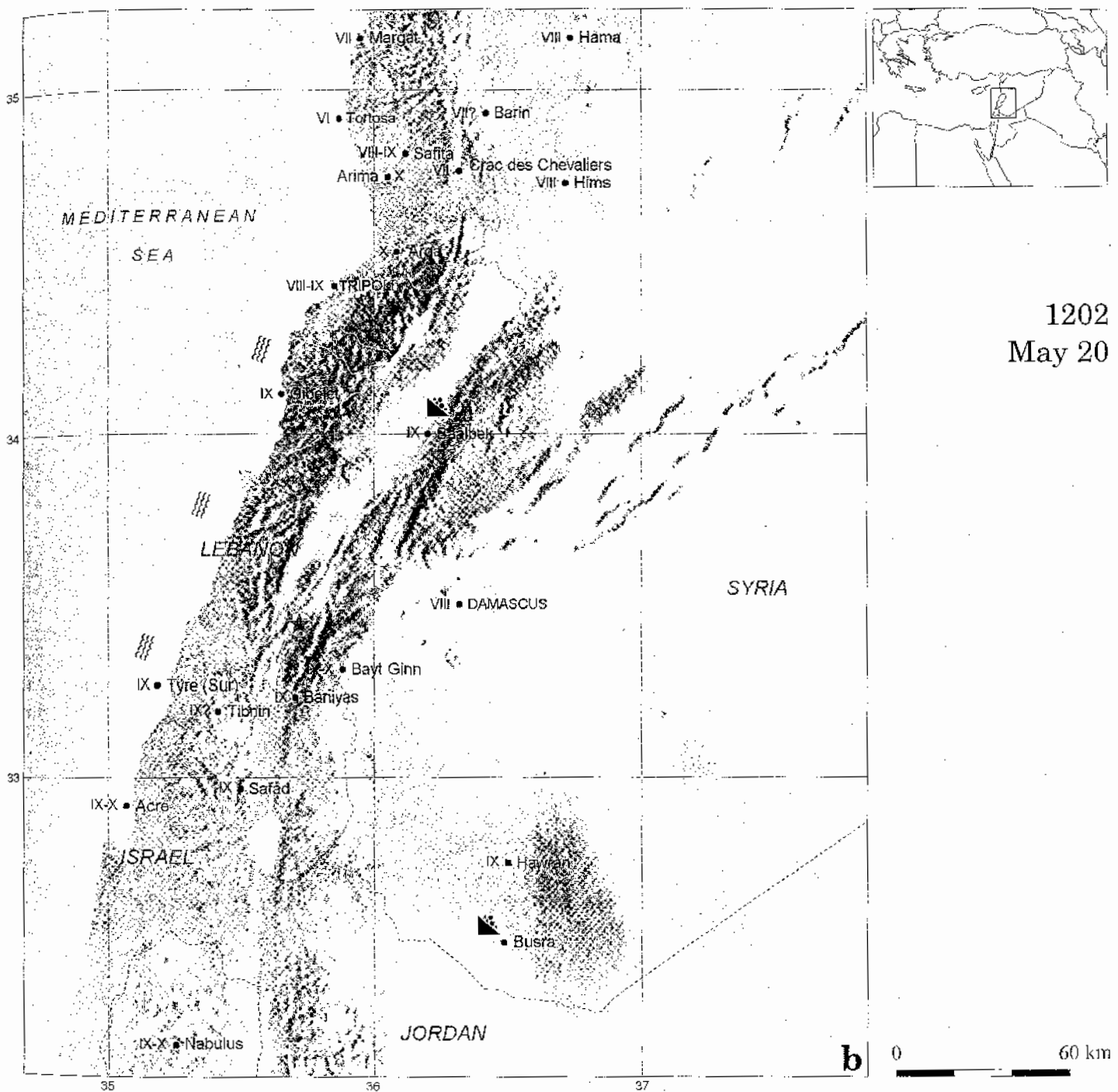


fig. 49b

the lime kilns (al-Kallasa), the Nur al-Din hospital, and nearly all the houses in the city. The inhabitants ran out into the squares. Sixteen balconies fell from the [Umayyad] mosque, and the Nasr mausoleum split open. Banyas was destroyed. People from Ba'alabik who had gone out to pick wild fruit were crushed to death when two mountains collapsed on top of each other. The citadel of Ba'alabik was destroyed, in spite of the fact that it was a strong building made of solid stone. The earthquake reached Hims, Hamat, Aleppo and other towns. The sea withdrew from the coast as far as Cyprus. There were very high waves which smashed boats on the shore. Then the earthquake spread

towards Akhlat, and into Armenia, Adharbayjan and Mesopotamia. About 1,100,000 victims were counted. The initial violence of the earthquake abated in the time it takes to read the *sura* of The Cave; but the shocks continued for days”.

وجاءت في شعبان زلزلة عظيمة هائلة من الصعيد فعمت الدنيا في ساعة واحدة فهدمت مدينة نابلس وبنيان في مصر فمات تحت الهدم خلق كثير ثم امتدت الى الشام والساحل فهدمت نابلس فلم يبق بها جدار قائم الا حارة السمرة ومات تحت الهدم ثلاثون ألفاً وهدمت عكا وصور وجميع قلاع الساحل وامتدت الى دمشق فرمت بعض المنارة الشرقية بجامع دمشق وأكثر الكلاسة والبيمارستان النوري وعامة دور دمشق الا القليل وهرب الناس الى الياطين وسقط من الجامع ست عشرة شرافة وتشقت قبة النصر وتهدمت بانياس. وخرج قوم من بعلبك يجنون الرياس من جبل قالتقى عليهم الجبلان وماتوا بأسرهم. وتهدمت قلعة بعلبك مع عظم حجارتها ووثيق عمارتها وامتدت الى حمص وحماة وحلب والعواصم وقطعت البحر الى قبرس وانترق البحر فصار أطوادا وقذف المراكب الى الساحل فتكسرت ثم امتدت الى أخلاط وأرمينية وأذربيجان والجزيرة وأحصى من هلك في هذه السنة على وجه التقريب فكان ألف انسان ومائة ألف انسان وكانت قوة الزلزلة في مبدأ الامر بمقدار ما يقرأ الانسان سورة الكهف ثم دامت بعد ذلك أياما.

The historian Ibn Wasil records that in 600 H. [= 1203-1204]:

“There was a violent earthquake which affected most regions of Egypt and Syria, Gazira [the Arabian peninsula], Bilad al-Rum [Byzantine territories], Sicily, Cyprus, Mosul, and Iraq; and they say it reached Sibtat [Ceuta] on the far side of the Maghreb [in Morocco].”

وفي هذه السنة كانت زلزلة عظيمة عمّت اكثر البلاد مصر والشام والجزيرة وبلاد الروم وصقلية وقبرص والموصل والعراق ويقال انها بلغت سبعة من اقصى المغرب

According to Ibn Munkala:

“Amongst the extraordinary things which happened in Cyprus, there was an earthquake in the year 597 which was felt from Syria to Mesopotamia, Byzantine territory and Iraq. The sea withdrew from the coast as far as Cyprus, throwing ships on to the island, and ending up on its eastern shores. God only knows how many earthquake victims there were”.

ومن غريب ما يتعلق بها (قبرس) أن الزلزلة التي امتدت من الشام الى الجزيرة وبلاد الروم والعراق سنة سبع وتسعين وخمسة انفرق بها البحر من الساحل الى قبرس وقذف المراكب الى ساحلها وتعدى الى ناحية الشرق ومات بسبب الزلزلة من الناس ما لا يعلمه الا الله.

The historian Ibn al-Wardi records that in the year 600 H. [= 1203-1204]:

“There was an earthquake which affected Egypt, Syria, Gazira [the Arabian peninsula], Bilad al-Rum [Byzantine territories], Sicily, Cyprus and Iraq. And Sur [Tyre] was destroyed”.

«وفيها» زلزلت مصر والشام والجزيرة و«بلاد» الروم وصقلية وقبرص والعراق وخربت صور.

Abu 'l-Fida gives the same date as Ibn al-Athir. He maintains that in the year of the Hegira 597 [=1200-1201]

“There was a violent earthquake in the regions of Gazira [the Arabian peninsula] and Syria and along the coast, and many towns were destroyed”.

(وفيها) كانت بالجزيرة والشام والسواحل زلزلة عظيمة فهدمت مدنا كثيرة.

For the year 600 H. [= 1203-1204], however, he writes that:

“There was a violent earthquake which spread across Egypt, Syria, Gazira, Bilad al-Rum, Sicily, Cyprus, Iraq and other regions. And the town walls at Sur [Tyre] were destroyed”.

[٦٠٠] (وفيها) كانت زلزلة عظيمة عمّت مصر والشام والجزيرة وبلاد الروم وصقلية وقبرص والعراق وغيرها وخربت سور مار-ينة صور.

▲ 1202 05 20 2:40 UT ☼ = 33 26 35 43 I₀ = X Me = 7.6 Sites: 30 EE: 1 Ts

location	lat.	long.	I	location	lat.	long.	I
Matbanat ad Dulb. RL	34 32	36 05	X	Hims SYR	34 44	36 43	VIII
Qalat al-Uraymah SYR	34 45	36 03	X	Al-Marqab SYR	35 09	35 57	VII
Akko IL	32 55	35 04	IX-X	Ba'rin SYR	34 56	36 25	VII?
Bayt Jimn SYR	33 19	35 53	IX-X	Qalat al-Hisn SYR	34 46	36 19	VII
Nabulus ANP	32 13	35 15	IX-X	Cairo ET	30 03	31 15	VI-VII
Baalbek RL	34 20	36 12	IX	Jerusalem	31 46	35 14	VI
Baniyas IL	33 14	35 42	IX	Tartus SYR	34 55	35 52	VI
Hawran area SYR	32 45	36 30	IX	Antioch TR	36 14	36 07	V-VI
Jubayl RL	34 07	35 39	IX	Aleppo SYR	36 14	37 10	V
Tibnin RL	33 12	35 25	IX?	Ahlat	38 45	42 29	F
Tyre RL	33 16	35 11	IX	Alexandria ET	31 12	29 55	F
Zefat IL	32 58	35 30	IX	Damietta ET	31 26	31 48	F
Safita SYR	34 49	36 07	VIII-IX	Mosul IRQ	36 20	43 08	F
Tripoli RL	34 26	35 51	VIII-IX	Qus ET	25 55	32 45	F
Damascus SYR	33 30	36 19	VIII	Busra a. Sham SYR	32 31	36 29	EE
Hamah SYR	35 09	36 44	VIII	Cyprus (island) CY	35 00	33 00	Ts

< 098 > 1204 - 1236 Beroia [Greece]

source Chom., *Analecta*, 48, pp.216-7
 historiography Kravari (1989)
 literature Ambraseys (1999)
 catalogue d. *Papazachos and Papazachou (1997)

On an unspecified day in the first three decades of the 13th century, the town of Beroia (now Verioia) was badly shaken by very strong earthquakes. The church of the Mother of God was destroyed. The earthquake is mentioned in a deed drawn up by Demetrius Chomatianus, archbishop of Ohrid (in present-day Macedonia) in and after 1216.

We read in the document:

"Divine wrath caused the town of Beroia to be destroyed and collapse, for very strong earthquakes reduced it to dust as though in a sieve, and the above-mentioned church of the Mother of God was reduced to dust".

τοῦ κάστρου δὲ Βερροίας ὀργῇ θεηλάτῳ καταστραφέντος, σεισμῶν σφοδροτάτων κοσκινηδὸν ἐπιβρισάντων αὐτῷ καταπέπτωκε, καὶ εἰς χοῦν ἐλεπτύνθη καὶ τὸ εἰρημενον τῆς Θεομήτορος τέμενος.

The date of the earthquake can be determined only approximately: the contents of the deed allow us to establish two *termini*: the first is the taking of Constantinople by the Latins (13 April 1204), or else, perhaps, the fall of Beroia into the hands of Kalojan, Tsar of Bulgaria (between 1205 and 1207); while the second is the year in which Demetrius Chomatianus died (c.1236). The only building to be mentioned is the church dedicated to the Theotokos Eleousa, which belonged to the Pakourianos family at the end of the 12th century. However, we do not know where it was situated (Kravari 1989, p.65). Papazachos and Papazachou (1997, p.191) date the earthquake to 1211, but the basis for their dating is unclear. Ambraseys date this earthquake to "beginning of 1200".

▲ 1204-1236

localities	lat.	long.	I
Verioia	40 31	22 12	IX

< 099 > **1206 January 29 – 1207 January 28** [655 A. e.] **Erznka**
[eastern Turkey]

source colophon in Yovsep'ean (1951, no.86, col.203)
catalogue d. Zeyt'unyan (1991)

In the year 655 of the Armenian era (1206-1207), the city of Eznka (now Erzincan, in Turkey), was struck by an earthquake whose effects are recorded in general terms. There is a reference to the event in a colophon in Yovsep'ean (1951, no.86, col.203). The manuscript contains a historical narrative by Kyriakos, which includes a chronicle for the years 1018-1603 containing the following passage:
"In the year 655 [1206-1207] an earthquake occurred in Ezngan".

Ի թվին ՌՃԵ ահազիւ շարժ եղել յԵզնկան.

The fact that it is often confused in the Armenian historiographical tradition with the later earthquakes at Erzincan in the years 675 and 685 of the Armenian era (1226-1227 and 1236-1237, see the entries concerned), makes one suspect a doublet. A comparison between the sources for these three earthquakes, however, has shown that the earthquake of 1206-1207 was almost certainly an independent event. The doublet very probably lies in the earthquakes of 1226-1227 and 1236-1237.

▲ 1206 01 29 – 1207 01 28 [655 A. e.]

localities	lat.	long.	I
Erzincan	39 44	39 30	NC

< 100 > **1209 Abruzzo Apennines [central Italy]**

source *Ann. Casinen.*, p.319
literature SGA Report [2001]

This earthquake is unknown to the seismic catalogue tradition. In 1209, strong earthquakes caused the collapse of many buildings, fortresses and fortified villages in the dioceses of Valva and Chieti. The area affected was probably in the Apennines where the two dioceses meet, in the upper valleys of the rivers Aterno and Pescara, at the border between the present-day provinces of L'Aquila and Pescara. The only available source in our present state of knowledge is the contemporary *Annales Casinenses*. This is the title given to the published collection of a number of compilations made by the Benedictine monks of Montecassino in the 11th-13th centuries, spanning the years 1000-1212. The text is very terse and not without ambiguities, but the authoritative nature of the source makes it possible to assert that we have evidence here of a very destructive event. It is recorded that in 1209 strong earthquakes struck various localities, in the province of Sannio – a name which, at that time, referred to a much larger area than it does today. "1209. [...] Great earthquakes in [various] places. At Valva and Tete in the province of Samnium, fortresses were reduced to ruins, as well as castles and other buildings".

1209. [...] Terre motus magni per loca. In Valvis et Tete provincia Samnii munitiones diruuntur, plura edificia et castella.

The place name Valva refers not to a town but to territory belonging to the diocese of that name, whose cathedral of S.Panfilo, built in the 5th century and rebuilt in the 11th, can still be seen today near Corfinio (in the province of L'Aquila). The diocese of Valva was subsequently merged with the adjacent diocese of Sulmona, and the present-day bishopric is still called the diocese of Sulmona-Valva. The place name "Tete" is to be read as "Teate", which is the Latin name for present-day Chieti, and one must

assume, by analogy with Valva, that the reference is not to the town but to the diocese. Furthermore, the fact that the description of the earthquake mentions the destruction of many fortresses and fortified villages suggests that the event is being attributed to an area rather than two specific localities.

▲ 1209 --

location	lat.	long.	I	location	lat.	long.	I
■ Diocese of Chieti	42 10	14 00	IX	■ Diocese of Valva	42 10	13 45	IX

< 101 > **1212 May 1 Gulf of Aqaba**

sources Abu Shama, *Dhayl*, p.78; Ibn Kathir, *al-Bidaya*, XIII, p.62; al-Maqrizi, *Kitab*, I/1, p.175; al-Suyuti, *Kashf*, p.49

literature Taher (1979); Klinger *et al.* (2000)

catalogues d. Perrey (1850); Sieberg (1932a); *Ambraseys *et al.* (1994); Amiran *et al.* (1994)

catalogues p. Ergin *et al.* (1967); Poirier and Taher (1980); al-Hakeem (1988)

On 27 *Dhu'l-qa'da* in the year 608 of the Hegira (corresponding to 1 May 1212) there was a destructive earthquake in southern Palestine and Egypt, with the worst damage at Aylat (Eilat) on the Gulf of Aqaba, where a great deal of destruction occurred. There were also widespread collapses, very serious damage and many victims not only at Cairo, where collapses occurred in both the old and new cities, but also at Al-Karak and Shubak (Ash Shawbak), two localities situated respectively to the east and south of the Dead Sea, in what is now Jordanian territory. There is also evidence that some towers collapsed in the citadel at Shubak (Jordan). The chief source for this earthquake is Abu Shama, an Arab historian and textual scholar from Damascus, who lived from 1203 to 1268:

"During the night of 27 *Dhu'l-qa'da* (1 May), there was a tremendous earthquake which destroyed many parts of old and new Cairo; it also destroyed towers and houses at Al-Karak and Shubak. Many women and children died in the ruins. The most violent shock was at Aylat, on the coast. It was said that the earthquake was preceded by a black wind and many falling stars".

وفي ليلة السابع والعشرين من ذي القعدة حدثت زلزلة عظيمة هدمت مواضع كثيرة بمصر والقاهرة وأبراجا ودورا بالكرك والشوبك وهلك جماعة من الصبيان والنسوان تحت الهدم وكان قوتها من أيلة مما يلي البحر وقيل إنه تقدمها يوم ربح أسود وتساقطت نجوم كثيرة.

The earthquake is also recorded in some chronicles compiled by Arab historians of later centuries. Thus Ibn Kathir (a 14th century historian from Damascus) records that:

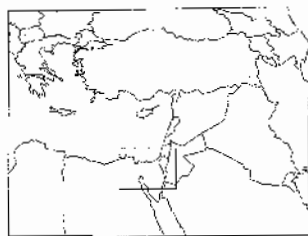
"There was a very violent earthquake in Egypt and at Cairo, and many houses were destroyed. The same thing happened at Al-Karak and Shubak, and some of its citadel towers were destroyed. Many women and children died in the ruins".

وفيها كانت زلزلة عظيمة شديدة بمصر والقاهرة هدمت منها دورا كثيرة وكذلك بالكرك والشوبك هدمت من قلعتها أبراجا ومات خلق كثير من الصبيان والنسوان تحت الهدم.

Al-Maqrizi, a geographer and scholar who lived in Cairo in the 14th century, records the earthquake in similar terms:

"There was a violent earthquake in Egypt and at Cairo, and many houses were destroyed. There was also an earthquake at Al-Karak and Shubak and many people died in the ruins and a number of towers in its citadel were destroyed. And smoke was seen coming down from heaven to earth in Damascus between dusk and evening".

وفيها كانت بمصر زلزلة شديدة تهدمت عدة دور بالقاهرة ومصر وزلزلت الكرك



1212
May 1

0 90 km

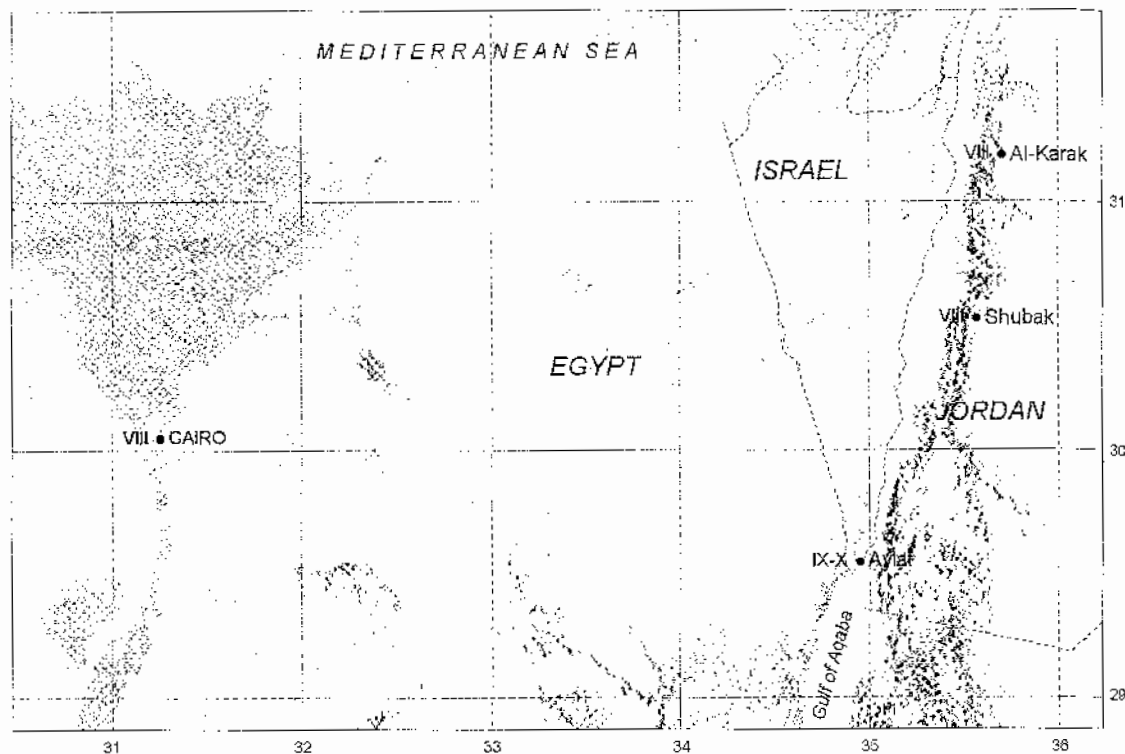


fig. 50

وشويك فمات تحت الهدم خلق كثير وسقط عدة من ابراج قلعتها ورؤى بدمشق دخان نازل من السماء الى الارض فيما بين المغرب والعشاء

Finally, the famous Cairo historian al-Suyuti (16th century) records:

"In the year 608 [H. = 1212-1213], there was a violent earthquake in Egypt and at Cairo, and many houses were destroyed. There was also an earthquake at Al-Karak and Shubak, and some towers in its citadel were destroyed and many people died in the ruins. Smoke was seen to come down from heaven to earth between dusk and evening at the tomb of 'Atika in the western part of Damascus".

وفي سنة ثمان وستمائة كانت زلزلة شديدة هدمت بمصر والقاهرة دورا كثيرة وكذلك بمدينة الكرك والشويك وهدمت من قلعتها ابراجا ومات خلق كثير من الصبيان والنساء تحت الهدم ورؤى دخان نازل من السماء الى الارض فيما بين المغرب والعشاء عند قبر عاتكة غربي دمشق.

▲ 1212 05 01 I₀ = VIII-IX Me = 5.8 Sites: 4

location	lat.	long.	I	location	lat.	long.	I
Elat IL	29 33	34 57	IX-X	Al-Karak HKJ	31 11	35 42	VIII
Cairo EP	30 03	31 15	VIII	Ash Shawbak HKJ	30 32	35 34	VIII

< 102 > 1213 June 22 Isauria [southern Turkey]

> fissures, emergence of sand, clouding of springs <

source Girbert de Boi, *Letter*, 1213 (in Röhricht 1893, pp.233-4, no.868)

This earthquake is unknown to the seismic catalogues.

On 22 June 1213, there was a destructive earthquake in the region of Isauria, now in southern Turkey. Many villages and castles collapsed, as well as two unnamed towns and an abbey near Philadelpheia. Fissures appeared on the slopes of a mountain, out

of which came, for one day, red and white water which subsequently acquired an unpleasant smell; large quantities of sand came out of fissures in the ground.

The earthquake is not mentioned in chronicles. The source is a letter sent in 1213 to Amadeus, archbishop of Constantinople from 1197 to 1220. Röhrich (1898, p.233, note 2), who edited the letter, thought he could identify the writer as a soldier named Girbert de Boi. The text refers to phenomena which almost certainly did occur, but which may have been exaggerated in order to adapt them to an ethical and religious message. In the letter, we read as follows:

"In the last week of August, we learned from reliable sources that, although the matter seemed almost incredible to those who heard of it, there had been an earthquake of greater violence than had ever been known before. It happened two days before the feast of St. John the Baptist [22 June], in the region of Isauria, which borders on the dominion of the sultan of Iconium; and it was so strong that many villas and castles were reduced to ruins, and two towns and an abbey near a city called Philadelpheia have plunged into the abyss, disappearing along with their inhabitants, and leaving behind a stretch of level ground where many things had existed before. What a tremendous prodigy this was before the gaze of all! Of the many things I still have to relate, one in particular certainly happened, my lord, that is to say, a mountain was split in two by the earthquake and for a whole day blood came out of one side and milk out of the other, after which, for another day, there came out stinking water and great quantities of sand; and you should know that the land where these prodigies occurred is inhabited by Christians. That is why I have told you about it: so that you may report it to your people".

Notificatum est nobis ultima septimana Augusti per veros nuncios, quod, quamvis verum tamen audientibus vix credibile, terre motus talis factus est, qui numquam fuerat auditus. Factus est pridie ante vigiliam sancti Johannis Baptiste in terra Losore, que afinis est soldani d'Encoine, et tam magnus, quod multe ville et castra corruerunt et due civitates, quedam abbatia ante quandam civitatem nomine Finedelfe in abissum perditae, tamen terra plana in impari loco remanente, cum habitantibus recesserunt. O mirum et cunctis admirandibus pavendum! Inter hec, que restat dicere, certe res est verissima, domine, quod quidam mons terre motus scissus per medium ex una parte sanguinem, ex alia lac visus est emanare per totam diem et ex eo alia die aqua fetidissima sabulum cum multitudine maxima, et sciatis, quod terra, in qua hoc mirabile factum est, christianorum est, et ideo mandavi vobis, ut hec populo annuncietis.

▲ 1213 06 22

location	lat.	long.	I	location	lat.	long.	I
■ Isauria area	37 15	32 20	X	Philadelpheia	36 37	33 02	Λ (IX)

(103) 1220 January 11 Mshakavank' [Armenia]

source Vard. Ar., *Hist.*, p.142

historiography Incicean (1822)

literature Abich (1882)

catalogues d. Step'anyan (1964); Zeyt'unyan (1991)

catalogues p. Kondorskaya and Shebalin (1982); Karapetian (1991); Berberian (1997)

On 11 January 1220, the church at Mshakavank' collapsed in a strong earthquake, killing four people inside. The source is the chronicler Vardan Arevelc'i (13th century): "One year before his consecration [i.e. that of the patriarch Kostand, in 669 arm. = 26 January 1220 - 24 January 1221], there was a fearful earthquake, and the elegantly

decorated church at Mshakavank' collapsed, on the 11th of January at lunch-time, tragically killing four clergy".

Նախ քան զձեռնարկին նորա միով ամառ՝ եղև շարժ անազին, և փլաւ պանունազարդ եկեղեցին, որ 'ի Մշակավանս 'ի մետասանն յունուարի 'ի ժամ ճաշոյ, և չորս պատարագող՝ ընդ մեծ զենմանն նուիրեցան:

Step'anyan (1964, p.60) cites a tradition dating the earthquake to 1219; but this is a chronological error of the usual kind.

▲ 1220 01 11

localities	lat.	long.	I
Mshakavank'	41 12	45 00	A (IX)

< 104 > 1222 May 11 Cyprus ▷ tsunami, new springs, formation of a lake <

sources 1 Oliv. Schol., *Hist.*, II, p.279; Caes. Heisterb., *Dial.*, II, pp.251-2; March. Scriba, *Ann.*, p.179; Albricus, *Chron.*, p.912; Phil. Navarre, *Récit*, p.30; *Chron. min. Byz.*, 25.5, in Schreiner (1975, p.199); *Notula* in Schreiner (1977, p.607, no.12) and in Constantinides-Browning (1993, p.161)

sources 2 *Chron. min. Arm.*, I.3, p.80; II.2, p.64.; *Est. de Eracles*, II, p.345; *Chron. Terre Sainte*, p.20; Amadi, *Chron.*, p.115

literature Darrouzès (1951); Hill (1972); Schreiner (1977); Ducellier (1980); Evangelatou-Notara (1984)

catalogues d. Bonito (1691); von Hoff (1840); Perrey (1850); Mallet (1853); Sieberg (1932a); Galanopoulos (1955); Grumel (1958); *Ambraseys (1965); Wirth (1966); *Ben-Menahem (1979); Alexandre (1990); Zeyt'unyan (1991); Evangelatou-Notara (1993); *Ambraseys *et al.* (1994)

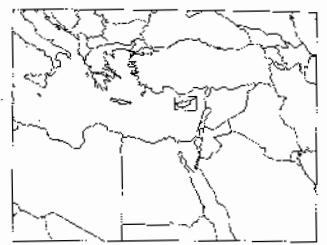
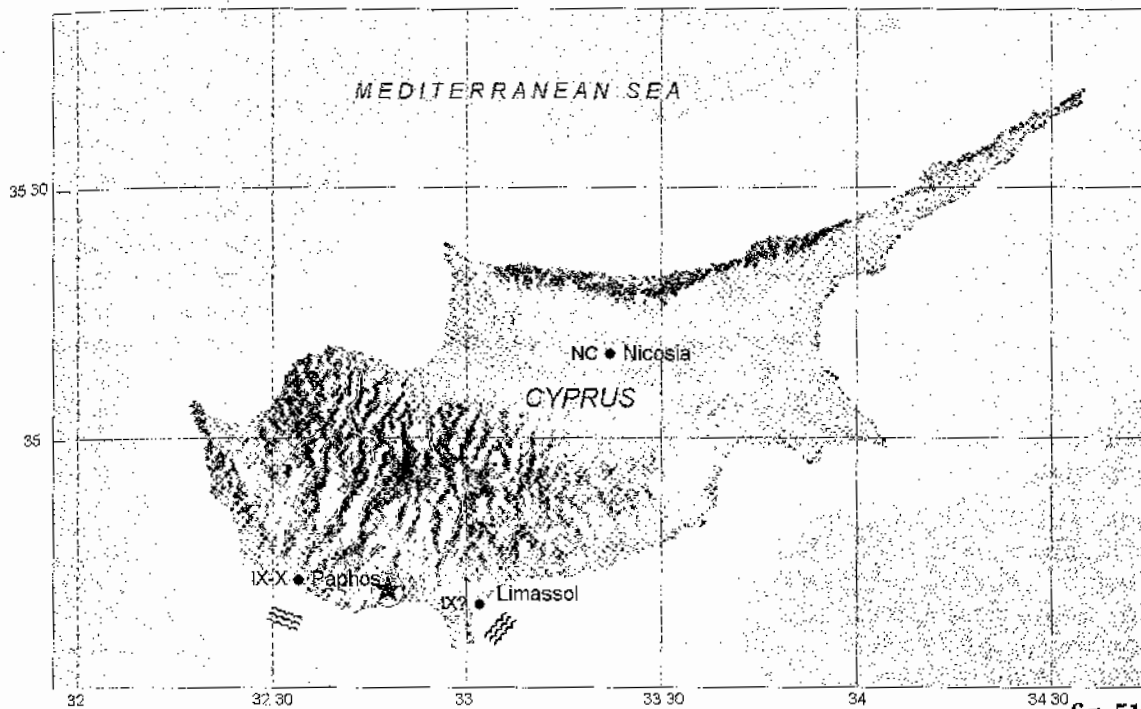
catalogues p. Ergin *et al.* (1967); Bektur and Alpay (1988)

catalogues Ts Ambraseys (1962); Antonopoulos (1980); Soloviev *et al.* (2000)

On 11 May 1222, there was a strong earthquake in the island of Cyprus, causing the collapse of many villages and churches. The towns of Limassol and Nicosia were affected, and especially Paphos, where the castle collapsed and there were many victims. The collapse of one church caused the death of the bishop and those who had gathered for mass. The earthquake was also felt in Egypt. Limassol and Paphos, which are situated on the south and west coast of the island respectively, were struck by a tsunami. According to another source, the harbour at Paphos was left completely without water. There is evidence of this earthquake in a number of contemporary sources: Latin, Greek and Vulgar French. And it is also mentioned in late 13th century Armenian chronicles. The most detailed description is to be found in the *Historia Damiatina* of Oliverus Scholasticus, a chronicler of the Fifth Crusade (1217-21) who was well acquainted with events in the Nile delta region in that period:

"In the year of grace 1222, in the month of May, a great earthquake occurred in Egypt, at Limassol and Nicosia and in other places in the same island [Cyprus], and especially at Paphos, to the extent that the town and the castle were completely destroyed, and men and women who were taken by surprise there at the moment of the shocks, died together, and the harbour was left dry, and shortly afterwards some springs spouted forth there".

Anno gratiae MCCXXII, mense Maio, factus est terrae motus magnus in Aegypto, Iymocio, Nicossia, aillsque loci eiusdem insulae, praesertim in Papho etiam, ut civitas cum castro penitus subverteretur, homines promiscui sexus, qui in ea reperti sunt tempore commotionis communiter exstincti, portus siccatus ubi postmodum aquae vivae fontes eruperunt.



1222
May 11

0 60 km

fig. 51

Further details are provided by the Cistercian monk Caesarius of Heisterbach (in the diocese of Cologne, in Germany). He is a contemporary source, and obtained information from eye-witnesses. In his work entitled *Dialogus miraculorum*, chapter 48 is specifically devoted to this earthquake:

“In this present year 1222 since the Incarnation of Our Lord, as we are told by some of those who are from the region concerned, two towns in Cyprus collapsed in the earthquake. Indeed, in one of those [towns], a church was shaken and collapsed as the bishop was celebrating mass at the altar, killing him and some of the congregation”.

In anno praesenti, qui est millesimus ducesimus vicesimus secundus ab incarnatione Domini, sicut narrant quidam de eisdem partibus venientes, duae civitates in Cipro a terraemotu corruerunt. In una vero illarum dum Episcopus in altari staret, missamque celebraret, ecclesia tremefacta cecidit, et tam ipsum quam reliquum populum extinxit.

In the following chapter 49, which deals with the earthquake at Brescia on 25 December 1222 (see below), the author refers to the Cyprus earthquake again, recording that “master Oliverus” (i.e. Oliverus Scholasticus) preached at Cologne at the beginning of Lent, probably in 1223:

“[...] at that same period in Cyprus, at Paphos and in many other provinces and towns, many were struck down by earthquakes. [...] This was unheard of for the times, and when at the beginning of Lent master Oliverus was preaching at Cologne, two mountains at Paphos with a lake between them moved together, thus becoming a single mountain”.

[...] in Cipro, in Papho, et in aliis multis provinciis atque civitatibus eodem tempore multos terruerunt terraemotus. [...] Quod a saeculo est inauditum, sicut in capite ieiunii magister Oliverus praedicavit Coloniae, duo montes in Papho habentes intra se stagnum conierunt, ita ut efficerentur mons unus.

There is also a brief reference to this earthquake in a chronicle compiled by another contemporary Cistercian monk, Albricus of Trium-fontium (Troisfontaines, in the diocese of Châlons in France):

"Anno 1222. [...] They say that the earthquake caused damage at maritime places and especially in Cyprus".

Anno 1222. [...] repertis locis etiam maritimis et maxime in Cypro terre motus fertur esse nocivus.

A reference to the seismic sea-wave at Paphos and Limassol is made by Marchisio Scriba, a Genoese notary, who succeeded Ogerio Pane as official annalist to the Republic of Genoa from 1220 onwards:

"After these things [negotiations for the surrender to the Arabs of Damietta — a stronghold in the Nile delta conquered by the Crusaders in 1219], the city was, alas, handed over, to the great shame and ignominy of the Christian name [...], for it had been freed from the filth of the pagans only with much effort and spilling of blood. But, by a divine miracle, the earth, saddened as one can imagine by the loss (of Damietta), shook in the island of Cyprus, and the sea withdrew from the shore, leaving a large part of the sea bed quite dry; and Paphos and Limassol were completely submerged by this sea-wave".

His igitur peractis, proh dolor, facta est restitutio illius civitatis, ad dedecus et ignominiam nominis christiani, [...] que tanto labore tantaque sanguinis effusione a paganorum spurcitiis fuerat liberata. De cuius amissione sicut premeditari potest, divino miraculo tellus tristis effecta, in insula Cipri contremuit, et mare littora consueta destituens, infra pelagum quam plurimum desiccavit; de quorum motu Baffa et Limiso penitus sunt submerse.

The Byzantine chronicle preserved in codex *Vaticanus Palatinus Graecus* 367 (published in Schreiner 1975, no.25, p.199) allows us to date the earthquake accurately to 11 May 1222. At fol.180r. there is a brief report:

"On 11 May, the fourth day [Wednesday], the wrath of God was made manifest in the great earthquake of the year 6730 [1 September 1221 – 31 August 1222]".

μηνὶ μαΐῳ ια', ἡμέρα τετράδι, ὥρα ἕκτη, γέγονεν ἡ θεοήλατος ὀργὴ τοῦ μεγάλου σεισοῦ, εἰς τὴν ,αψλ' ἔχρονίαν.

In 1222, 11 May was indeed a Wednesday.

The *Notula* in codex *Graecus* 1588 of Bibliothèque National de France fol.217 (published in Schreiner 1977, p.607, no.12, and in Constantinides and Browning 1993, p.161) is more detailed, but fragmentary:

"And on that same day [12 May] there was a great earthquake in the same island of Cyprus. Many churches and villages collapsed, as did the castle of Paphos, and many men, women and children were killed. The earthquake lasted for four years [?] in the year 6730 [1 September 1221 – 31 August 1222], on the fourth day [Wednesday], at the third hour of the day".

καὶ τῆ αὐτῆ ἡμέρα ἐγένετο σεισμός μέγας ἐν τῆδε τῆ νήσῳ τῆ Κύπρῳ καὶ ἐχάλασαν ἐκκλησίαι πολλὰ καὶ χωρία πολλὰ καὶ τὸ κάστρο ἡ Πάφος καὶ ἐφονεύθησαν λαὸς πολὺς, ἄνδρες τε καὶ γυναῖκες καὶ νήπια καὶ ἐκράτησεν ὁ σεισμός χρόνους τέσσαρες*** καθολ*** ἡμέραν, ἔτους ,αψλ', ἡμέρα τετάρτη, ὥρα τρίτη τῆς ἡμέρας.

There is an echo of this earthquake in a vulgar French work by Philippe de Navarre, a 13th century author:

"And in that year [1222] there was a great earthquake in Cyprus, which destroyed the town of Paphos".

Et en cel an, fu le grant crole en Chipre, quy abati Baphe.

Brief references to this earthquake also appear in late 13th century Armenian chronicles. Thus the so-called *Annals of King Het'um* (*Chron. min. Arm.* I.3) record for the year 670 [25 January 1221 – 24 January 1222]:

"There was a violent earthquake and it destroyed Afn in the island of Cyprus".

Եղև սաստիկ շարժ և փլույց զԱֆն ի Կիպրոս կղզին.

The editor supposes that "Afn" means Paphos (Hakobyan 1951, p.95, no.63); the form "Pafn", is found in a similar context in the so-called *Chronicle of the historian Het'um* (*Chron. min. Arm.* II.64.24-25).

According to Wirth (1966, p.394) the *Notula in Parisinus Graecus* 1588 should be expanded as suggested by Darrouzès (1951, p.44), thus obtaining $\epsilon\psi\lambda[\epsilon]$ [6735 = 1226/7]. This would give us another earthquake. The aftershocks mentioned in the *Notula* would thus work out as having occurred in 1227 and 1231. This same argument was implicitly accepted at first by Evangelatou-Notara (1984, p.27, no.90), who dates the earthquake to 12 May 1227. Later on, however she changed her mind (Evangelatou-Notara 1993, p.19), rejecting the addition, as suggested by Schreiner (1977, p.607).

▲	1222 05 11	6:15 UT	☉ = 34 42 32 48	Io = IX	Me = 6.0	Sites: 3	Ts
location	lat.	long.	I	location	lat.	long.	I
Paphos	34 43	32 34	IX-X Ts	Nicosia	35 10	33 22	NC
Limassol	34 40	33 02	IX? Ts				

< 105 > 1222 December 25 Brescia area [northern Italy]

sources 1 Documents (parchments)

ACapBs, *Pergamene*, filza +6, 1223; ASMi, *Diplomatico*, Pergam. fondi, *Brescia*, S.Giovanni, no.74, no.75; *Cremona*, S.Lorenzo, no.166; *Leno*, S.Benedetto, no.94; ASMi, *Diplomatico*, Pergam. fondi, Pergam. varie prov. *Brescia*, no.96;

Papal letters

Honorius III, *Ep. Sel.* (ed. Rodenberg 1883), 9 January 1225: nos. 264, 265, 266, pp.189-91; 6 May 1226: no.295, p.215

Annals, chronicles and *Notulae*

Italy *Ann. Bergom.*, p.332; *Ann. Brix.* (cod. B), p.818; *Ann. Brix.* (cod. C), p.818; *Ann. Cremon.*, p.14; *Ann. Mant.*, p.21; *Ann. Mediol. brev.*, p.391; *Ann. S.Justin. Patav.*, p.152; *Ann. S.Trin. Veron.*, p.6; *Ann. Veron. ant.*, p.57; *Ann. Veteres*, p.91; Bonav. Bagnor., *Sermo III*, 9, p.583; *Chron. Marchie Turv.*, p.7; *Chron. Parm.*, p.9; *Chron. Fav.*, p.150; Codagnello, *Ann.*, p.72; *Lib. not. sanct. Med.*, col.59b; *Liber Regim. Pad.*, p.77; March. Scriba, *Ann.*, pp.187-8; Milioli, *Liber*, p.504; *Notae S.Georgii Mediol.*, p.389; Paris. Cerea, *Ann.*, p.6; Rolandino, *Chron.*, pp.30-1; Salimb. Adam, *Cron.*, pp.34, 586; *Notula* added to the manuscript of the *Chronica* of Dandolo (in Muratori 1728, cols.343-4, note); *Notula* by witness from Ferrara (in Baroni 1969, p.54); ACapMo, O.III.13, *Notula*; Verse composition from the Piacenza area (in Holder-Egger 1891, p.480); BAVat, Pal. Lat. 927, *Calend.*, fol.216r.; Verse composition in codex CX in the BCapVr (in Cipolla 1890, p.352 and in Turrini 1978-79, pp.10-1); Verse composition in *Addimentum* to Sicard, *Cron.*, pp.182-3

Europe Albricus, *Chron.*, p.912; *Ann. de Margan*, p.429; *Ann. Dorens.*, p.527; *Ann. Dunstapl.*, p.505; *Ann. Mell. cont.*, p.623; *Ann. Scheftl.*, p.338; Caes. Heisterb., *Dial.*, II, p.251; *Catalog. Imp. et Pont.*, p.115; *Chron. Magni presb. Cont. Reichersp.*, p.527; *Chron. Montis Ser.*; p.200; *Chron. regia Colon.*, p.252; Chounr. Schir, *Ann.*, p.632; Emo, *Chron.*, p.498; Ralph Cogg., *Hist.*, p.358; Thomas Eccl., *De adv.*, pp.562-3; Thomas Spal., *Hist.*, p.580

inscriptions

1) at the old church of S.Nazaro in Campo, Milan (in Magistretti and Monneret de Villard 1917, col.59b); 2) on the bell-tower of the church of S.Mauro at Costozza (Vicenza)

sources 2

BArlosteaFc, Da Marano, cl.I, 534, *Cron.*; Agazzari, *Chron.*, p.22; Aliprandi, *Alipran.*, p.114; *Ann. vet. Mutin.*, col.58; Battagli, *Marcha*, p.7; *Chron. Est.*, p.11; *Chron. Pont. et Imp. Mant.*, p.219; Mussi, *Chron.*, cols.459-60; *Cron. Bologn.*, p.86; *Cron. Ramp.*, II, pp.85-8;

- Cron. Varign.*, p.86; *Frag. Mem. pot. Mutinae*, p.188; Galvan. Flamma, *Manip.*, col.668; *Gesta Lucan. (Ann. Lucen.)*, pp.302-3; Giov. Bazz., *Chron.*, p.14; Griffoni, *Mem.*, p.8; Iacopo Varag., *Cron.*, p.374; Malvezzi, *Chron.*, p.900; Marzagaia, *De mod. gest.*, p.57; Villola, *Chron.*, p.85; *Quaedam scitu*, col.736; Riccob. Ferr., *Compil.*, p.247; Riccob. Ferr., *Pomar.*, col.127; Sanudo, *Le Vite*, p.539; Tol. Lucca, *Ann.*, p.111; Ventura, *Mem.*, col.734; Pagliarino, *Cron.*, p.35; *Vita Honorii Papae III*, p.569
- historiography Zagata (ed. 1745); Corio (1503); Giustiniani (1537); Alberti (1541); Buoni (1571); Sigonio (1578); Campo (1585); Capriolo (1585); Saraina (1586); Cavitelli (1588); Bonifaccio (1591); Morigia (1591); Sigonio (1591); Codagli (1592); Dalla Corte (1594); Ghirardacci (1596); Vizani (1602); Donesmondi (1612); Montemerlo (1618); Possevino (1628); Panvinio (1648); Faleoni (1649); Campi (1651); Faino (1658); Palladio degli Olivi (1660); Riccioli (1669); Lancellotti (1673); Calvi (1676); Maresti (1678); Tatti (1683); Aurelio da Genova (1720); Marcantonio (1728); Biancolini (1749, 1760); Muratori (1762); Paganetto (1766); Poggiali (1766); Ardesco Molina (1774); Molina (1776); Castellini (1784); Rovelli (1794); Affò (1795); Galliccioli (1795); Savioli (1795); Carli (1796); Tonelli (1797); Volta (1807); Figari (1810); Dal Verme (1828); Rossi A.D. (1829); Semeria (1838); Bravo (1840); Canobbio (1840); Righi (1840); Gionta (1844); Alizeri (1846); Muzzi (1846); Panciroli (1846); Giulini (1854); Grandi (1856); Moroni (1856); Odorici (1856); Nicoletti (1862); Gargantini (1874); Salice (1874); Di Manzano (1879); Remondini (1882); Poncini (1884); Rossi G. (1886); Capponi (1887); Tassoni (1888); Winkelmann (1889); Gallo (1890); Lucchini (1894); Valentini (1896); Remondini and Remondini (1897); Podestà (1901); Neugebauer (1904); Candraia (1905); Enlart (1910); Fainelli (1911); Enlart (1922); Castagna (1924a, b); Labò (1932); Salvi (1932); Grosso (1933a, b); Mor (1934); Pesce (1959); Pistarino (1961); Bosisio (1963); Polonio (1963); Panazza (1964); Trentini (1970); Ceschi (1974); Pesenti (1976); Folgheraiter (1976); Pelligrini (1977); Cavallari (1979); Nardini (1979); Sisto (1979); Turrini (1979); Pizzi (1981); Russo (1981); Murolo (1982); Pasquini (1982)
- literature Guidoboni *et al.* (1985); Guidoboni (1986); Guidoboni and Boschi (1989); Guidoboni (1995); Guidoboni (1997); Guidoboni and Ciuccarelli (2003b)
- catalogues d. *comets and eclipses*: Oppolzer (1887); Ho Peng Yoke (1962); Maffei (1987); Yeomans (1991)
Bonito (1691); von Hoff (1840); Perrey (1848); Perrey (1850); Mallet (1853); Reginus (1880); Mercalli (1883, 1897); Baratta (1901); Guidi (1915); Zanon (1937); Grumel (1958); Alexandre (1990); *Boschi *et al.* (1995, 1997, 2000)
- catalogues p. Giorgetti and Iaccarino (1971); Carrozzo *et al.* (1973); Postpischl (1985); CPTI (1999)

History of the earthquake's interpretation

The study of this earthquake now has its own history, which merits a brief survey. The earthquake passed from the monastic chronicle tradition into the erudite historiography of modern times, and from there into the first catalogues of historical earthquakes (from Bonito 1691 to Baratta 1901), and it has gradually become more specifically identified with Brescia, acquiring increasingly catastrophic characteristics.

Baratta (1901) located it at Brescia, and there it remained up to and including the 1970s, when Italian scholars looked at it again. When the first parametric catalogues of historical earthquakes were compiled, the urgent need to give it numerical attributes resulted in its receiving a city of Brescia location and an epicentral intensity of grade XI MCS (Giorgetti and Iaccarino 1971; Carrozzo *et al.* 1973).

Since this earthquake, together with that of 1117 (see above), was a very destructive event for the Po Plain, it was subjected to thorough reinvestigation in the years 1983-85 (macroseismic studies for the nuclear sites in Italy, Guidoboni *et al.* 1985). On that occasion, large-scale research was carried out into documentary sources, chronicles and inscriptions, in order to establish an accurate picture of this event.

The research threw light on the particular cultural context within which the earthquake occurred, namely the campaign against heresy, of which Brescia was one of the principal centres in the 13th century. Only by carefully examining the original sources

(papal documents and chronicles compiled by direct witnesses) has it been possible to redefine the seismic scenario concerned. It should also be pointed out that the previous overvaluated interpretation of the earthquake led to a striking local sense of alarm about seismic risk in Brescia.

Only since the research of the 1980s, therefore, has a reliable macroseismic picture of the event been available, as well as a more accurate analysis of the problems and limitations of the evidence dating to the time of the event (Guidoboni 1986; Guidoboni and Boschi 1989; Guidoboni 1995). An analysis of the historical and cultural context has thus been vitally important in arriving at a fresh assessment of this earthquake and stripping away the almost "mythical" and symbolic connotations which surrounded it.

Chronology

It should be noted that most sources date the earthquake to 25 December 1223, adopting the Nativity style in which the year began on Christmas Day. Hence the number of the year is advanced by one in the period 25-31 December.

The sources do not entirely agree as to the time of day when the earthquake occurred. Some suggest the third hour, others the sixth, and yet others the ninth (i.e. 9:15, 11:30 and 13:45 UT). Most, however, converge on an intermediate time: between the sixth and ninth hours, or after the celebration of solemn mass, or else at lunch time (roughly between 11:30 and 13:40 UT). It is likely that there were two shocks, the first of which was the stronger. A contemporary source from Ferrara in fact specifically states that there was a second shock towards vespers (roughly between 15:00 and 15:50 UT).

During the night of 28 December, another earthquake was felt in Milan. There followed a number of further minor shocks which caused the inhabitants of Brescia to camp out in the open. These persisted for thirty or forty days.

Many contemporary chronicles report that this earthquake was accompanied by two astronomical phenomena: a passing comet and an eclipse of the moon. The former can be identified as Halley's comet, whose passage was recorded by Chinese, Korean and Japanese observers during the months of September and October 1222 (Ho Peng Yoke 1962, p.191; Yeomans 1991, p.397; Maffei 1987, pp.220-4). And there was indeed an eclipse of the moon on 22 October in that year (Oppolzer 1887, p.362).

Aspect of the historical context: Brescia as a town to be "taken down"

Around the 1220s, Brescia was going through a phase of particular political and religious tension. Internal struggles between factions were endemic in the Italian city states of the time, and in the case of Brescia they had even led to the direct involvement of pope Honorius III (1216-1227) and the emperor Frederick II (1220-1250). For in addition to the traditional rivalry between the nobility and "popular" organisations, there was now a much tougher struggle in progress between a group of forces aiming to defend the "heretics", who were mainly but not exclusively drawn from the nobility, and a group which remained faithful to the Church of Rome. The Brescia heretics (Albigenses and Waldenses) were fiercely attacked by both the emperor Frederick II and pope Honorius III, who was intent on combating every sign of heresy by any means available to him.

Brescia was thus outlawed by Frederick II in 1221, because the city council had ejected a pro-imperial *podestà* Matteo da Correggio and replaced him with Oberto Gambarà, a Brescian accused of heresy by the pope. The internal struggle reached an extreme of violence in 1224, when the heretical faction attempted military action against catholic churches and buildings owned by enemy families. These internal wars provide an explanation for the widespread damage suffered by the most typical urban buildings, though in making accusations against the heretics, Honorius III was quite capable of using earthquake effects for ideological purposes, holding the heretics responsible for all damage, and not mentioning earthquake effects as such.

In spite of this internal political turbulence, Brescia was enjoying considerable economic and urban expansion. Towards the mid-13th century — a few decades after the earthquake — the city walls were doubled, and years before that, the commune had begun to purchase the buildings situated around the main square in order to erect a new town hall (*palazzo pubblico*). Studies carried out by the Archaeological Superintendency of Brescia have confirmed that widespread use was made of timber both in load-bearing structures and roofs, often alongside light materials such as brick and plaster.

General effects of the earthquake

When the earthquake struck on 25 December 1222, Brescia was thus in the midst of violent political turmoil. The major damage zone included the city of Brescia itself and more particularly, diocesan territory to the south. However, the documentary evidence we have found does not confirm the image of "total destruction" suggested by the narrative sources. In the urban area, the earthquake seems mostly to have affected the upper parts of buildings, but not the load-bearing structures of the principal city buildings. In all probability, partial collapses and other damage did occur, and must be added to the effects of the turbulent political situation in the city. However, the damage zone has to be extended beyond the city itself, for the most serious destruction occurred in the southern part of the ancient diocese (Lower diocese of Brescia). Damage was less severe in the diocesan territory to the north (Upper diocese of Brescia). The ancient diocese of Brescia (see fig. 53) corresponds to the present-day province of Brescia as regards land to the north of the city, but in the south it was bounded by the river Oglio and a stretch of territory beyond the river Chiese, including some localities which subsequently came to be within the present-day dioceses of Verona and Mantua. The ancient diocese of Brescia was thus quite large, stretching from the foothills of the Alps to the marshy and wooded areas beside the river Po, and it included land farther south than the present-day province. The castle of Marano was badly damaged, as was the village of Lazise, which stood close to the frontier between the territory of Brescia and that of Verona. As far as the Veneto is concerned, the bell-tower of the church of S. Mauro at Costozza was probably damaged. Many unidentified buildings were damaged at Modena. The roof of the cathedral of S. Pietro in Bologna is recorded as having collapsed without causing injury; but it may be that the damage attributed to the earthquake was in fact due to the roof's chronic instability. Further roof collapses were in fact recorded a few years after the earthquake. In Milan, the earthquake produced a crack in the old church of S. Nazaro. The inhabitants fled the city and lived in tents for more than eight days for fear of shocks. In Venice, bells rang of their own accord and one side of the monastery of S. Giorgio was damaged. At Ferrara, the earthquake was described as "great", and was followed by another on the same day. There was a severe panic, but no effects other than fear are recorded.

The people of Parma fled the city in great panic; but no damage is reported. In Verona, people fled from the old Roman arena, where festivities were being held. Everyone in Genoa was frightened, and immediately after the earthquake they went in procession through the city. In Padua and Reggio Emilia, the earthquake is described as "great" or "very great"; but no specific effects are recorded. Many people were struck with terror in Bergamo and Como. The earthquake was also felt in Romagna and Tuscany.

Historical sources: an overall view

ARCHIVAL DOCUMENTS

There is evidence of damage in the countryside around Brescia in a document drawn up by the bishop of Brescia on 12 June 1223 (Archivio Capitolare, Museo Diocesano d'Arte Sacra, Brescia, *Pergamene*, filza +6).

An examination of the principal document collections concerning Lombard and Brescian territory in the 13th century led to the discovery of some indirect evidence of the 1222 earthquake in the *Diplomatico* archives in the State Archives in Milan. For the most part, these are deeds involved in civil suits where it was important either to put a date to one's recollections, or to refer to situations known to all the principal parties, such as a major earthquake.

Two deeds relating to Brescian territory (an exact dating is not possible) specifically refer to the earthquake for dating purposes, but without mentioning actual damage. The first of these is evidence provided by witnesses for the counts of Magazano, and is preserved amongst the parchments of S.Benedetto at Leno (no.94); in the second, it is established that the mill channels at Leno are to be restored to the state they were in before the earthquake. The second is preserved amongst the parchments of S.Giovanni and S.Luca in Brescia (no.75).

In a parchment dated 31 March 1235 concerning litigation between the Bocca and Gonzaga families (*Pergamene varie della provincia di Brescia*, no.96), reference is made both to damage to the church of S.Agata, situated near the Brescia city gate, and to the cost of repairing houses in the city; but it is not specifically stated whether the damage was attributable to the earthquake or to other causes.

A 1236 parchment from the church of S.Lorenzo in Cremona (no.166) was drawn up in the monastery of S.Tommaso, perhaps because the church was not in a fit state for use. There are some notes in the margin of certain contemporary liturgical codices which provide important evidence towards establishing a general picture of the earthquake's effects. On the cover of codex O.III.13 in the Archivio Capitolare (Cathedral Archives) in Modena (see fig. 52), there is a *Notula* which records earthquake damage in Modena and the surrounding area, as well as at Brescia, which is described as having been "destroyed".

There is also a note in a liturgical calendar from the monastery of SS.Trinità in Verona (Biblioteca Apostolica Vaticana, *Palatini Latini*, 927, fol.216r.) which is couched in more general terms but is important for establishing where damage occurred: it mentions the *terrae* of Brescia as suffering the worst damage.

There are also four letters written by pope Honorius III (dated 9 January 1225 and 6 May 1226), which are extremely important for the light they throw on the political and religious situation at Brescia, though they do not refer directly to the earthquake.

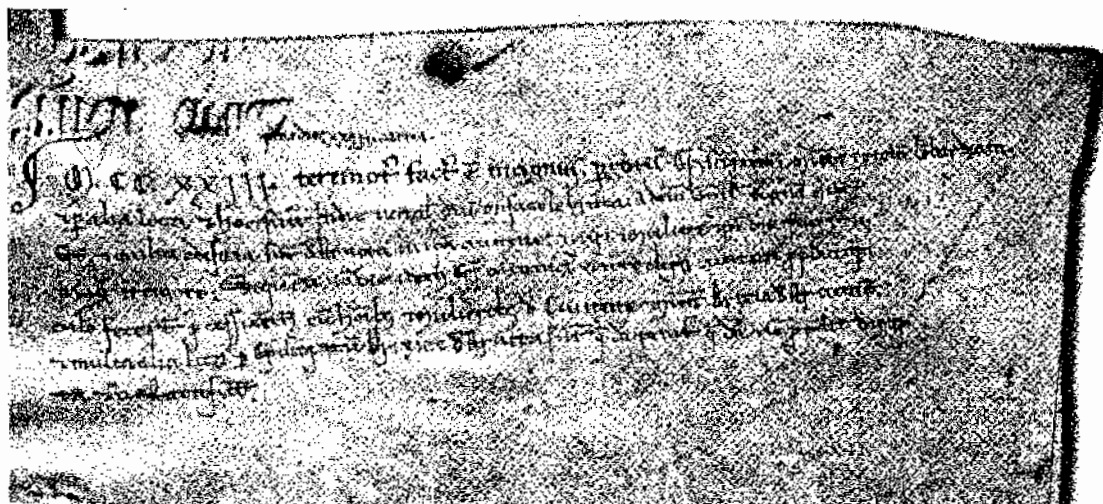


fig. 52 Cover of codex: a contemporary *Notula* which records damage caused by the earthquake of 25 December 1222 at Modena and Brescia, and in the diocese of Brescia (Archivio Capitolare, Modena, codex O.III.13).

There are a great many contemporary chronicles of different types which provide original and independent information about the earthquake: chronicles, short verse compositions and annals.

The sources from Italy are mostly town chronicles and annals, some of which provide explicit information in relation to the town concerned. This local character is quite different from what we find in the chronicle of Salimbene de Adam, a Franciscan friar. He was one of the most penetrating chroniclers of Italian town life in the 13th century, and his work is also important for the diffusion it enjoyed in later centuries. Salimbene records a great many details about the effects of this earthquake in Parma, Reggio and Brescia. And his account is enhanced by what his mother told him of the earthquake in Parma, where she was living when the earthquake occurred. Salimbene was born on 9 October 1221, and so was scarcely more than a year old at the time of the earthquake. News of the earthquake of 25 December 1222 made a deep impression in the principal monasteries of Europe, whether in German, Frankish or Anglo-Saxon regions, as one can tell from the numerous annals which record it. The monks of the Cistercian order showed a particular interest. Many chronicles are fairly imprecise about its location, but most agree in indicating "*Lombardia*" (or "*Longobardia*") as the region most affected. This term denoted an area much larger than the present-day region of Lombardy. Ancient *Lombardia* included part of Emilia (but not Romagna) and part of the Veneto; and in some cases it was simply a general term for northern Italy. Some annals provide more local information and specify that Brescia was the worst affected town. In certain cases, they provide information and even details about towns which are not mentioned in other chronicles from Italy (e.g. Como and Bergamo). Of the many chronicle sources selected, 27 of those dating to the 13th and 14th centuries and making use of earlier sources, now lost, are from Italy, and 14 from elsewhere in Europe.

INSCRIPTIONS

A record of the earthquake has been found in two inscriptions.

■ 1 - on an altar in the old church of S.Nazaro in Campo in Milan; but the original has been lost because the old church was demolished around 1490, and the present-day Santuario di S.Maria dei Miracoli, also known as S.Maria presso S.Celso, has been built in its place. However, the text is preserved in a manuscript in the Biblioteca Capitolare in Milan, edited by Magistretti and Monneret de Villard (1917, col.59b).

■ 2 - the second inscription may date to the 14th century, and is built into the base of the old bell-tower at the church of S.Mauro at Costozza (province of Vicenza). It records not only the earthquake of 1222 (1223, Nativity style), but also those of 1117 and 1348.

Earthquake's effects by locality, based only on primary sources

(in descending order of seriousness of effects; see parameters, p.259)

Set out below is a description of the effects of the earthquake and reactions to it in the localities and areas where it struck. Thirteenth century sources are given, together with slightly later (14th century) chronicles which make use of earlier sources now lost and can therefore be considered reliable and important.

Brescia and its diocese

As indicated in most contemporary sources from Italy and elsewhere in Europe Brescia was the worst affected town. However, information which we have discovered in documents and chronicles does not confirm the image of "total destruction" which narrative sources suggest. We find instead that the impact of the earthquake was quite complex. In the urban area, on the one hand, the earthquake of 25 December seems to have principally affected the upper parts of buildings — such as chimneys, cornices and projecting decorative elements — but not the load-bearing structures (

the principal city buildings, whether secular or ecclesiastical. On the other hand, it becomes clear that extra-urban areas suffered the worst damage. Some sources in fact extend the damage zone to the diocese. No names of specific places are given, but the information concerned is confirmed by a decision to eliminate the seventeenth canonicate, in order to limit costs, some of which were attributable to the earthquake.

We can be sure that Brescia's towers were not completely destroyed, because there is a reliable document of 1225 from the papal chancery containing an order from Honorius III to demolish towers belonging to heretic noblemen and to lower those of their supporters. Such an order would not have made sense if the towers had already been destroyed in the earthquake.

In a letter of 1225, pope Honorius III attributed the destruction of certain churches to these same heretics. Furthermore, the description of the earthquake by the famous chronicler Salimbene de Adam also provides a picture of limited effects; and we have to remember that he had heard oral accounts of the event, having been born the year before (1221). We can deduce that the city of Brescia was not destroyed, not only because the pope gave orders for towers to be demolished, and because the overall documentary evidence does not support such a view, but also because Salimbene tells us that many roof-tops and ornamental elements remained in position. In fact, he actually states that the people of Brescia acquired the habit of laughing every time the top of a building collapsed, because they had become so accustomed to aftershocks in the months succeeding the earthquake.

The image of a highly destructive earthquake whose energy was concentrated into the shock of 25 December and destroyed the city of Brescia, gives way, therefore, to one of a long but not very violent seismic sequence. In all probability the earthquake added partial collapses and further damage to what had already been brought about by the turbulent political situation in the city. Finally, test excavations carried out within the urban area by the Archaeological Superintendency of Brescia confirm the absence of extensive restoration work ascribable to the early 13th century at the churches of S.Salvatore and S.Giulia; and they also confirm the presence of original structures at the base of many 12th and 13th century houses. Brescia and its diocese are the places for which we have most evidence, for there are documentary, chronicle and *Notulae* sources.

DOCUMENTARY SOURCES FOR BRESCIA AND ITS DIOCESE

There is evidence of damage in the Brescian countryside in instructions issued on 12 June 1223 by the bishop of Brescia (Archivio Capitolare, Museo Diocesano d'Arte Sacra, Brescia, *Pergamene*, filza +6) for the elimination of the seventeenth canonicate in his diocese, in order to reduce costs:

"For these reasons, beloved in God, with grateful acknowledgement of your just requests which closely coincide with the possibilities examined by your above-mentioned Church, which is burdened as much by earthquake damage as by many other expenses, we order by means of this present letter, whose contents must be adhered to in the future, that from now on this same church shall be limited to just sixteen canons, even though there are at present seventeen, since it is the custom that only sixteen have church service duties. [...]. Given at Brescia, on the day before the Ides of June [12 June], in the year 1223 since the birth of Our Lord Jesus Christ, in the eleventh indiction".

Ea propter dilecti in Domino vestris iustis postulationibus grato concurrentes assensu facultatibus predictae Ecclesiae vestre diligenter inspectis, que tam terremotuum ruinis, quam multis aliis dispendiis plurimum aggravatur, pagina presenti statuimus, et futuris in ipsa decernimus temporibus observandum, ut eadem de cetero sedenario Canonorum numero solummodo sit contenta; non obstante eo quod decem et septem sitis ad presens qui consuevistis sedecim tantum esse in ipsa divinis obsequiis mancipati. [...] Datum Brixie, II idus junii, anno a nativitate Domini Nostri Jesu Christi millesimo ducentesimo vigesimo tertio, indictione undecima.

On the cover of codex O.III.13, in the Archivio Capitolare at Modena, there is a quite interesting *Notula* providing further evidence of damage in the diocese of Brescia: "1223. There was a great earthquake [...]; it happened on Christmas Day [...] Brescia was destroyed, as well as many other places in the diocese of Brescia. Some places were completely destroyed, whole others suffered only partial collapses or damage".

M.CC.XXJJJ. terremotus factus est magnus [...] hoc fuit in die natalis [...] Brixia destructa est et multa alia loca per episcopatum brixie. Destructa sunt quedam penitus quedam vero pro parte dirupta et vastata sunt.

An annotation in a liturgical calendar from the monastery of SS.Trinità in Verona (Biblioteca Apostolica Vaticana, *Palatinus Latinus* 927, fol.216r.) mentions the dependent villages of the city of Brescia as worst affected:

"In the year 1223, on Christmas Day, a Sunday, at the ninth hour, there were great earthquakes which made the whole earth shake, and indeed especially in the villages belonging to the city of Brescia a great many churches and not a few houses were immediately reduced to ruins".

Anno MCCXXIII Nativitatis Domini die dominica ad nonam horam terremotus magnus fuerunt qui terram totam tremere fecerunt, maxime vero brixie urbis terris quam plures ecclesie domique [...] non pauci subito ruerunt.

We find the earthquake being used for dating purposes in evidence provided by witnesses for the counts of Magazano (Archivio di Stato, Milan, *Diplomatico*, Pergamene per fondi, Leno, San Benedetto, no.94). One witness said he was twenty when the earthquake occurred:

"Teodaldo de Ardricis [gave evidence] that he was 20 years old when the earthquake occurred, and he said that since the earthquake he had seen that Silva and Magazano were in the service of and employed by the counts and men of Asola [...]".

Teudaldus de Ardricis se habere XX annos quando terremotus fuit et a terremotu infra dicit se vidisse Silvam et Magazanum teneri et usari per comites et per homines Asule [...].

The second positive piece of evidence is to be found in another 13th century parchment from the churches of S.Giovanni and S.Luca in Brescia (no.75). It sets out that the mill channels of the Leno mill should be restored to the state they were in *before* the earthquake:

"The prior of the church of S.Giovanni Fuori le Mura, together with his brethren, maintains that the church of S.Giovanni is and will be burdened and damaged by the construction carried out by the prior of S.Luca and his brethren [...] Those of S.Giovanni say that the old mill must have four channels with all the necessary equipment for the said channels [...] and that the channels must be as wide as they were before the earthquake".

Credit dominus prepositus ecclesie Sancti Johannis de Foris cum suis fratribus ecclesiam Sancti Johannis gravatam esse et damnificatam et fieri per edificationem quam facit dominus prepositus de Sancto Lucha cum suis fratribus [...] Item dicunt illi de Sancto Johanne quod molendinum vetus debet habere quatuor canallea cum omnibus instrumentis convenientibus ad dictas canalles [...] quae canallia sint eiusdem ad latitudinis qualis erant ante terremotum.

In a parchment dated 31 March 1235 concerning litigation between the Bocca and Gonzaga families (*Pergamene varie della provincia di Brescia*, no.96), mention is made not only of damage to the church of S.Agata, near the Brescia city gate, but also of the cost of repairing houses in the city. But we are not told whether the damage was caused by the earthquake or not:

"[...] paid or given to one of the men from Gambarara in connection with repairs to the

church of S.Agata [...] ten *librae imperiales* for restoring and repairing houses in the commune of Brescia”.

[...] *expense vel date alicui illorum de Gambarara occasione refectionis ecclesie Sante Agathe [...] X libras imperiales pro optatione et refectione domorum comunium Brixie.*

CHRONICLE SOURCES FOR BRESCIA AND ITS DIOCESE

We have already mentioned the chronicle compiled by the Franciscan friar Salimbene de Adam as being the most detailed in its description of earthquake effects at Brescia: “In the year of Our Lord 1222 [...] And in that same year, on Christmas Day, there was a very great earthquake [...] And this earthquake was felt throughout Lombardy and Tuscany. But it was known in particular as the Brescia earthquake because it was strongest there, to the extent that the people of Brescia left the city and camped in tents, for fear that buildings would fall on top of them. And many houses, towers and fortified villages belonging to the Brescians collapsed in the earthquake. And the people of Brescia grew so accustomed to that earthquake that when the top of some tower or house fell down, they looked on and laughed out loud. [At this point Salimbene transcribes a verse composition].

And the patriarch of Antioch, who was of the family of the Roberti of Reggio, died at Lyons. He had been bishop of Brescia at the time of the great earthquake. And hearing the shouts of a Franciscan who was staying with him when he was bishop, he came out of his chamber, and immediately afterwards the chamber collapsed in the earthquake shock. He thus realised that this was the grace of God, and so he became totally devoted to Him”.

Anno Domini MCCXXII [...] Et in eodem anno in nativitate domini nostri Iesu Christi fuit maximus terremotus [...] Et fuit iste terremotus per totam Lombardiam et Tusciam. Et appellatus fuit terremotus Brixie specialiter, quia plus viguit ibi, ita quod egressi Brixienenses de civitate morabantur extra in papilionibus, ne edificia caderent super eos. Et plures domus turres et castra Brixienesium corruerunt ex illo terremotu. Et ita erant Brixienenses assuefacti ex illo terremotu, quod, quando cadebat pynaculum alicuius turris vel domus, aspiciebant et cum clamore ridebant. [...]

Et patriarcha Antiochenus obiit apud Lugdunum, qui fuit de Robertis de Regio; et tempore magni terremotus erat episcopus Brixienensis. Et cum ad clamorem cuiusdam fratris Minoris, qui morabatur cum eo, dum episcopus esset, cameram fuisset egressus, et post egressus inmediate ex concussione terremotus camera cecidisset, ita hoc beneficium cognovit a Deo, quod totaliter est conversus ad ipsum.

Some of the information provided by Salimbene is recorded in similar terms by Alberto Milioli, a contemporary of his who worked as a notary for the commune of Reggio. The annals of Brescia, on the other hand, are extremely terse. In the *Annales Brixienenses* (“Codex B”, p.818), which were compiled in the abbey of S.Pietro at Brescia, we read: “There was so great an earthquake that it damaged houses, towers, churches, towns and villages, and the destruction caused great harm to many people in Brescia and its diocese, and it happened on Christmas Day”.

Terremotus sic magnus fuit, quod subruit domos turres ecclesias castella et civitates, quarum ruina multi mortales oppressi sunt Brixie et per eius episcopatum, et fuit in die Natalis.

The version of the same annals in “Codex C” (p.818) is even more telegraphic: “1223. A great earthquake on Christmas Day”.

1223. *In die nativitatis terremotus magnus.*

Almost all the town chronicles of northern Italy refer to seismic effects at Brescia. The

earthquake is also recorded in late 13th century notes added to a liturgical calendar from the church of S. Giorgio in Milan (*Notae S. Georgii Mediolanenses*):

"On the eighth day before the Calends of January 1223 [25 December 1222], on Sunday at about the sixth hour, there was a great earthquake throughout Italy; and almost all the city of Brescia was reduced to ruins, and almost all the diocese was destroyed, and many men, women and children died in that city".

8 Kalendas Ianuarii 1223. die dominico circa horam sextam fuit terre motus magnus per totam Ytaliam; et fere tota civitas Brixensis devastata fuit et episcopatum totum destructum fere, et multi homines et pueri et femine mortui sunt in illa civitate.

The only place actually named in the *Annales Bergomates* (first half of the 13th century) is Brescia:

"In the year 1222. [...] In the same year, on Christmas Day, at about the sixth hour there was a very great earthquake, and especially in Brescia and its district countless buildings collapsed, and many men and women were killed".

An. MCCXXII. [...] Eodem anno in die nativitatis Domini circa horam sextam fuit terremotus maximus, et precipue in Brixia et districtu eius innumerabilia edificia corruerunt, et multi homines et mulieres mortui sunt.

The *Annales* compiled by Parisio da Cerea, a contemporary writer who worked as notary in Verona, make a brief reference to Brescia after recording damage in the Verona area:

"1223. On 25 December, Christmas Day, at the third hour, there was an earthquake in Lombardy and everywhere else on earth [...] and most of the walls and houses in the city of Brescia collapsed".

1223. 25 Decembris in festo nativitatis domini Iesu Christi hora tertiarum fuit terra motus in Lombardia undique super terram [...] et maior pars murorum et domorum civitatis Brixiae cecidit.

The other 13th century Veronese annals make no mention of Verona, at least explicitly, but almost all mention Brescia. The *Annales S. Trinitatis Veronenses*, compiled from the second quarter of the 12th century onwards, record:

"1223. On Christmas Day, a Sunday, before the ninth hour, there were great earthquakes, which caused the whole earth to shake. Especially in the city of Brescia, great many towers, churches and quite a few people's houses immediately collapsed"

1223. in natali Domini, die dominico, ante horam nonam terre motus magni fuerunt qui terram totam tremere fecerunt. Maxime vero Brixie urbis turres quam plure ecclesie domusque hominum non pauci subito ruerunt.

The *Annales Veronenses antiqui* and the *Annales Veteres*, both of which were compiled in the second half of the 13th century, are briefer. The *Annales Veronenses antiqui* record: "In this [year, 1223], on Christmas Day, there was a very great earthquake and the towers of Brescia collapsed and nearly all the city of Brescia was destroyed".

Hoc, die Nativitatis Domini, fuit maximus terremotus et turres Brixie ceciderunt et per tota civitas Brixie diruta fuit.

The *Annales Veteres* state:

"1223. On Christmas Day there was a great earthquake".

M. CC. XXIII. Die nativitatis domini magnus terremotus fuit.

Codex CX in the Biblioteca Capitolare at Verona (ed. Cipolla 1890, p. 533; ed. Turrii 1978-79, pp. 10-1) contains a short verse composition:

"In the year of Our Lord 1223, when he [Pecorario] ruled over Verona, all those wh

were celebrating Christmas in Lombardy felt an earthquake. Then the towers of Brescia collapsed and nearly all its houses were reduced to ruins”.

*Ano domini ducenti / mille erant viginti / et tres, con ille rexit / veronam cum
teremotum / cuncti samsere / longonbardiam qui coluere / festa natalis / brisie ture
tunc cecidere / domos omnes fere ruere.*

The earthquake is recorded as “very great” in the *Chronicon Marchiae Tarvisinae et Lombardiae*, a compilation made in the second half of the 13th century by a monk from the monastery of S.Giustina in Padua:

“In the year of Our Lord 1223, on Christmas Day, between the sixth and ninth hours, there was a very great earthquake; but of the towns in Italy it was at the city of Brescia that the incredible shaking caused the most harm to property, houses and people”.

*Anno Domini 1223 in die natalis Domini, inter sextam et nonam horam per totam
Italiam factus est maximus terre motus; sed super urbes Italie civitas brixienensis
incredibiliter conquassata maximum dampnum sustinuit in rebus, domibus et personis.*

A longer report appears in the *Chronica in factis et circa facta Marchie Trivixane*, compiled in the third quarter of the 13th century by Rolandino, a notary from Padua:

“Throughout Italy the earth trembled, mountain peaks were shaken by the force of the earthquake for almost an hour, on Christmas Day, immediately after the solemn celebration of mass, with the result that many houses and palaces collapsed, and people were killed in the towns; and the destruction was so great at Brescia that the inhabitants thought the whole city would be swallowed up. And this earthquake occurred at the end of the year of Our Lord 1222”.

*In partibus namque Ytalie universis terra tremuit, iuga montium sunt commota propter
vehemenciam terre motus, durantis fere per unam horam, in ipsa die natalis Domini,
statim post missarum sollempnia celebrata, adeo quod multe domus et pallacia
corruerunt, homines perierunt per civitates; et in Brixia maxime tanta ruina fuit, quod
Brixianenses timuerunt quodammodo ne tota civitas sit submersa. Et hic terre motus fuit
completis annis Domini MCCXXII.*

In another verse composition from the Piacenza area (published by Holder-Egger 1891, p.480), written on the occasion of the 1222 earthquake, we read:

“When the earth shook.

It was during the year 1222 when the earth trembled and shook in the month of December, on Christmas Day itself, and the shaking began at the sixth hour. The whole of Brescia lay in a heap of ruins. Houses, towers and castles lie in ruins. Praise, therefore, to the guardian who controls all things, who saves, protects and helps whoever he wishes”.

Quando terra tremuit.

*Viginti duo currebant et mille ducenti / Tempore, quo quassa terraque mota fuit, /
Decembri mense, Domini quoque nativitate, / Hora sexta cepit adesse tremor. / Brixia
tota fere iacuit sub mole ruine, / Domus et turre, castra vulsaque iacent. / Ergo
laudetur custos, qui cuncta gubernat, / Qui vult quos servat, protegit atque iuvat.*

There is a brief reference to Brescia in the *Annales Ianuenses* (pp.187-8), an official chronicle compiled by the notaries of the commune, in this case Marchisio Scriba:

“Brescia was indeed most severely affected by this same earthquake which involved the whole of Italy, suffering both the destruction of houses and the death of men”.

*Brixia vero ex visitatione ipsius terre motus, qui fere totam Ytaliam occupavit, tam
murorum destructione, quam virorum occisione maximam persecutionem persensit.*

In the continuation of the *Chronicon Faventinum* for the years 1219-1236 by Tolosano, who was a canon at Faenza cathedral (Romagna), it is recorded that the earthquake also

affected Romagna, and that there were two thousand victims in Brescia and its diocese: "In the year of Our Lord 1222, on Christmas Day, a violent earthquake was felt at the third hour in Romagna and Lombardy, and especially in Brescia and its diocese, where it killed at least two thousand men, women and children. The damage to houses and towers was such that the city was almost destroyed".

Anno Domini MCCXXII, die nativitatis Domini, venit vehemens terremotus hora tercie in Romania et Lombardia, et maxime in Brixia et eius episcopatu, qui bene MM inter viros et mulieres, pueros et puellas interemit; civitas, cum domibus et turribus dirupta, fere est dissipata.

Two Franciscan writers, Thomas, bishop of Spalato and Thomas of Eccleston, refer to the earthquake within the context of the preaching of St. Francis.

In 1222, Thomas, the future bishop of Spalato, was a student at Bologna, and on 15 August he heard St. Francis preach there:

"At this time in Liguria, Emilia and the March of the Veneto, there was a great and horrendous earthquake on Christmas Day, at about the third hour, with the result that many buildings were razed to the ground. Indeed, a large part of the city of Brescia was destroyed, and a great multitude of people, especially heretics, were crushed and killed".

His temporibus factus est terremotus magnus et oribilis in die nativitatis Domini circha oram terciam per Liguriam, Emiliam et per marchiam Veneticam, ita ut multa edificia ad terram ruerent. Civitas vero Brexiana ex magna parte sui prostrata est, multaque ominum multitudo et maxima ereticorum oppressa est et extinta.

In his *Liber de adventu Minorum in Angliam*, compiled around 1258-59, the chronicler Thomas of Eccleston records evidence from his fellow Franciscan Martin of Barton, that, in Bologna, St. Francis predicted an earthquake, which was subsequently identified as the one in the Brescia area almost five months later, on 25 December 1222:

"At that time Friar Martin of Barton also came to England. He was fortunate enough to see St. Francis frequently [...]. He also told us that a friar who was praying at Brescia on Christmas Day was found unharmed in the ruins of the church during the earthquake which St. Francis had predicted and caused to be announced by the friars in all the schools in Bologna by means of a letter written in common Latin. This earthquake occurred before the war undertaken by the emperor Frederick, and it lasted for forty days, with the result that all the mountains in Lombardy were shaken".

Venit quoque in Angliam tunc temporis Frater Martinus de Barton, qui beatum Franciscum frequenter videre meruit [...] Dixit quoque quod frater quidam, qui stetit in oratione Brixiae in Die Natali Domini in tremore quem praedixerat Sanctus Franciscus et per omnes scholas Bononiae per fratres praedicari fecerat, per literam in qua fui plurimum Latinum, et ecclesia corruit, ob ruinam lapidum, illaesus inventus est. Hi terrae motus ante guerram Frederici per continuos xl dies factus est, ita ut moverentur omnes montes Lumbardiae.

There is also a reference to St. Francis' prediction in a sermon by Bonaventura (Bagnoregio) (*Opera Omnia*, tome 9, p.583).

Further details can also be found in German, Frankish and Anglo-Saxon chronicles: Chapter 49 in the contemporary *Dialogus miraculorum* by the Cistercian monk Caesarius of Heisterbach (diocese of Cologne in Germany) deals with the Brescia earthquake of 25 December 1222. The number of victims he gives, however, is very exaggerated:

"During Advent, the Milanese heretics and those who were in Brescia sent many cart loads of food. On Christmas Day itself, however, while they were banqueting, the Lord shook the earth, and as buildings fell he brought about the death of more than twelve

thousand people. Others fled into the countryside, and when they heard the cries of the dying, they did not dare to return to the city to help them. [...] Nor is that surprising. So many towers and other buildings collapsed that no less than the end of the world itself seemed imminent”.

In Adventu Domini haeretici Mediolanenses haeretici qui erant in Brixia, multa plaustra cum victualibus transmiserunt. In ipsa vero die Nativitatis Domini dum convivarent, Dominus terram concussit, et cadentibus aedificiis plus quam duodecim millia hominum extinxit. Alii fugientes in campum cum audirent clamores morientium, non fuerunt ausi redire in civitatem ad illorum succursum. [...] Nec mirum. Tot turres, tot aedificia corruerunt, ut nihil aliud, nisi finis mundi instare videretur.

After briefly mentioning an earthquake at Cologne on 11 January 1223, the continuation of the *Chronica regia Coloniensis* (or *Annales Colonienses Maximi*) for the years 1220-1238, compiled in the monastery of St. Pantaleon, provides much greater detail about that of Christmas Day 1222:

“In the year of Our Lord 1222 [...]. In Lombardy, too, there was such an earthquake on Christmas Day itself, striking twice a day for two days, that churches and other buildings were destroyed in many places, priests and other men were killed, almost the whole city of Brescia and its people were destroyed, rocks were wrenched from mountains, fortified villages were reduced to ruins, and in this way dreadful calamities and disasters occurred. In Rome, furthermore, earth mixed with blood was seen to rain from the clouds”.

Anno Domini 1222 [...] in Longobardia eciam talis terre motus fuit ipsa die natalis Domini, per duas ebdomadas quottidie bis perdurans, ut in pluribus locis edificia et ecclesias everteret, homines cum sacerdotibus opprimeret, Brixiam quoque civitatem fere totam cum populo obrueret, rupes de montibus evelleret, castra deiceret, et sic inauditas calamitates et miserias perpetraret. Rome eciam terra mixta sanguine visa est de nubibus pluere.

Brescia is also mentioned in the annals of Klosterneuburg (in the diocese of Passau). These are a continuation of the *Annales Mellicenses*, which were compiled around 1142-43 and continued by various authors up to 1233 (*Continuatio Claustroneoburgensis tertia*). We read there:

“In the year 1223. There was a great earthquake in Longobardia, such as had never been seen before. A city called Brescia was razed to the ground and many people perished there”.

Anno 1223. In Longobardia terre motus factus est magnus, qualis nec antea aliquando. Civitas quedam nomine Brixia funditus est subversa, et multi homines in ea perierunt.

There is also a brief reference to the earthquake in a chronicle compiled by a contemporary Cistercian monk, Albricus of Triumfontium (Troisfontaines, in the diocese of Châlons in France):

“In the year 1222 [...] On Christmas Eve thunder was heard and there was an earthquake in Italy, but it was particularly violent at the city of Brescia, almost half of which was reduced to ruins, and everyone was buried in the ruins in that part of the city [...]”.

Anno 1222 [...] In vigilia natalis Domini auditum est tonitruum et fuit terre motus in Italia, sed violentior in civitate Brixia, cuius pars fere media subvertitur, absorptis omnibus in ea parte [...].

In the early 13th century, Abbot Ralph of the Cistercian monastery of Coggeshall (in the diocese of London) mentions Brescia and three other unspecified towns:

“1223. There was so great an earthquake in Italy that some towns, that is to say Brescia and three others, were reduced to ruins and swallowed up with their inhabitants”.

1223. *Terre motus factus est magnus in Italia, ita quod quedam civitates, id est Brixia cum aliis quibusdam tribus, subverse sint et absorte cum habitatoribus suis.*

The *Annales* of the Cistercian monastery of Margan (in the diocese of Llandaff in Wales) seem to progressively focus in on the location of the earthquake:

"1222 [...] In that year there was a great earthquake in many places across the seas, which caused some towns to be shaken to their foundations, together with their inhabitants. Amongst these was a certain city in Longobardia called Brescia, most of which was destroyed with its churches on Christmas night, with the death of almost two thousand people".

1222 [...] *Fuitque eodem anno terremotus magnus multis in locis in transmarinis partibus, ex quo urbes aliquae subruite sunt funditus cum hominibus in illis degentibus; inter quas erat quedam urbs in Longobardia nomine Brisa, ex qua pars maxima in nocte natalis Domini subversa est cum ecclesiis, ubi quoque perierunt fere duo milia hominum.*

The *Annales* of Dunstable (in the diocese of Lincoln in England) record:

"1223 [...] There was so great an earthquake in various places in Italy and Apulia that the city of Brescia was destroyed. Several thousand people died there under the walls and buildings, while others fled and founded a new city near the site of the old one".

1223 [...] *Factus est terremotus magnus diversis locis in Italia et Apulia, ita quod civitas Brissiensis demollita est. In qua pleraque milia hominum sub muris et palatiis perierunt, alii autem fugientes novam civitatem iuxta situm veteris fundaverunt.*

Marano di Valpolicella and Lazise (Verona)

The castle of Marano collapsed, as well as the houses of the inhabitants of Lazise. The source for both these places is the *Annales* compiled by Parisio da Cerca, a contemporary notary from Verona:

"1223. At the third hour on 25 December, Christmas Day, there was an earthquake in Lombardy and everywhere else on earth [...]. And the castle of Marano collapsed, as did the houses of the people of Lazise [...]"

1223. 25 Decembris in festo nativitatis domini Iesu Christi hora tertiarum fuit terrae motus in Lombardia undique super terram, [...]. Et castru de Marano, et domus illorum de Lazisio cecidit [...].

Modena and its diocese

Many unspecified buildings suffered serious damage, and the inhabitants were very frightened. The Bishop organised a procession the day after the earthquake. Our source is a *Notula* written on the cover of codex O.III.13 in the Archivio Capitolare at Modena:

"1223. There was a great earthquake throughout the diocese of Modena and throughout Lombardy, and elsewhere. It happened on Christmas Day, when mass was celebrated by bishop Guglielmo of Modena to give thanks to God. Many buildings were destroyed in that city, and men and women lived in great terror that day. The following day the bishop, with the canons and all the clergy of the city made a procession in connection with this danger, together with the men and women of the city of Modena".

M.CC.XXJJJ. terremotus factus est magnus per totum episcopatum mutine et per totam lombardiam et per alia loca et hoc fuit in die natalis domini missa celebrata a domino guillelmo dei gratia mutinensi episcopo et multa edificia sunt destructa in ipsa civitate et viri et mulieres ipsa die fuerunt in magno tremore. Sequenti vero die idem episcopus cum canonicis et toto clero civitatis pro predicto periculo fecerunt processionem cum hominibus et mulieribus de civitate mutine.

Costozza (Vicenza)

There is an inscription, possibly dating to the 14th century, at the base of the bell-tower of the church of S.Mauro at Costozza, which records the date of the earthquake. It seems likely that this refers to damage suffered by the bell-tower itself, in which a number of different stages of construction can be found:

"1223 At the time of the earthquake [...]".

MCCXXIII T(em)p(ore) t(er)remoti [...].

The inscription also gives the dates of the earthquakes of 1117 and 1348.

Bologna

There was an earthquake described as "great" or "very great". Everybody fled from the cathedral of S.Pietro, where the bishop was celebrating Christmas mass. The earliest source is the chronicle of Pietro Villola, dating to the second half of the 14th century. There are three separate passages in which the event is recorded (II, pp.85, 87):

"1222. [...] Also in that year, on Christmas Day, there was a great earthquake at dinner time and suddenly the roof of the church of S.Pietro collapsed after mass had been celebrated and the clergy had brought the service to an end. [...]"

1223. [...] In that year, while the bishop was celebrating mass at the altar in S.Pietro, there was a great earthquake in the whole of Italy and everyone fled from the church [...] In that year on Christmas Day there was a very great earthquake".

Mccxxii. [...] Item eo anno in die natalis fuit magnus terremotus ora prandii et tuc statim cecidit copertura ecclesie sancti Petri dicta missa et separatis clericis ab officio. [...]

Mccxxiii. [...] Eo anno cum cantaretur missa per episcopum ad altare sancti Petri fuit terremotus magnus per totam Ytaliam et homnes fugierunt de eclexia. [...]

Eo anno in die nativitatis Domini nostri Yhesu Christi fuit maximus terremotus.

The church of S.Pietro had been completed about forty years earlier, in 1182. It was a three-nave church with a trussed wooden roof. In 1228, the roof collapsed again without there being any direct external cause, which suggests a fault in construction. It is possible, then, that the collapse in 1222 was also principally caused by truss failure: the strong earthquake felt at Bologna probably caused the supporting walls to sway, thereby loosening the truss beams and causing them to fall. Another possibility is that the Bolognese chroniclers have combined two separate events which actually occurred six years apart: the Brescia earthquake and the collapse of the roof of S.Pietro. In which case, there will have been just one roof collapse, in 1228, not caused by the earthquake (see Guidoboni and Ciuccarelli 2003b, pp.299-303, 341).

Ferrara

There was an earthquake described as "great", followed by another on the same day. Much panic ensued. A chronicler writing in the second half of the 14th century records that many chimneys fell down. An anonymous eye-witness of the earthquake (in Baroni 1969, p.54) reports:

"In the eleventh indiction. On Christmas Day in the year of Our Lord 1223, between the ninth and sixth hours, while everyone was dining, there was a great earthquake which lasted for about half an hour [word crossed out]: we all thought we would be killed. This was at Ferrara. On that same day, which was a Sunday, there was another earthquake at the hour of vespers".

Indicione XI. Anno Domini milesimo ducentesimo XX tertio in die natalis Domini, prandentibus omnibus inter oram nonam et sextam fuit terremotus magnus fere media hora: credebamus omnes mori. Et hoc fuit Ferrarie. Similiter die illo, hora vespertina fuit alius terremotus et fuit die dominico.

Later evidence from the 14-15th century chronicler Giacomo da Marano (Biblioteca Comunale Ariosteana, Ferrara, cl.I, 534) records that chimneys fell down: "On the said 25 December [1222], between the ninth hour and vespers there was a horrendous and very great earthquake at the city of Ferrara. It lasted for more than half an hour and caused many chimneys to fall down in the city, and the earthquake was felt in many places in Italy, where it did a great deal of harm".

Nel dito 25 dicembre tra nona e Vespro trete uno horribile et grandissimo terremoto in la Cittade di Ferrara el quale durò più di una mezza hora e fece cadere molti camini in la Cittade, el quale terremoto fu sentito in molti luochi de Italia dove fece infiniti mali.

Milan

The earthquake of 25 December 1222 produced a crack in the old church of S.Nazaro in Campo (now the Santuario di S.Maria dei Miracoli, also known as S.Maria presso S.Celso). On 28 December 1222, another shock was felt. The people of Milan abandoned the city and lived in tents for more than eight days, for fear of further shocks. The sources are three chronicles. Two are contemporary, and the third dates to the 13th-14th century. The only source to record the earthquake of 28 December 1222 as well, is the *Annales Mediolanenses breves*, compiled about 1228:

"1223. On Christmas Day, a Sunday, at about the ninth hour, the earth shook in the city of Milan. On the fourth day following [Wednesday 28 December], the earth shook again, at night".

1223. Die dominico in nativitate Domini circa horam nonam terra tremuit in Mediolani civitate. Item in sequenti quarta feria tremuit in nocte.

In the *Liber notitiae sanctorum Mediolani* (Milan, ed. 1917, col.59B), the only damage mentioned is that at S.Nazaro in Campo. Mention is also made of an inscription inside the church, now no longer in existence. The building was in fact demolished around 1490, and the present-day Santuario di S.Maria dei Miracoli, also known as S.Maria presso S.Celso, was erected on the site:

"[St.Basilides] was once buried there with St.Cyrius and St.Nabor. Consequently, in 1221 [he means 1222], because a wall of S.Nazaro in Campo was cracked in an earthquake, those who were to build another wall base inside say that they found the saints' bodies on that occasion. So they built an altar on top, and what happened is written there.

1223 years had at that time gone by since the beginning, when there was a very violent earthquake in the world: churches, houses, towers and villages disappeared from city to city".

[...] iacuit olim cum sanctis cirino et nabore. quapropter anno domini MCCXXI propter terremotum cum esset murum scisum ecclesie sancti nazarii in campo volentes facere intus altum pedem muri. dicunt quia tunc inuerunt corpora sanctorum. Unde super factum est altare et ibi. ita est scriptum.

Annorum numerus tunc fluxit ab ortu / Ducenti viginti tres cum mille fuere. / Qua terremotus profusus fluxit in orbe / Templa domus turre terre fluxere per urbes.

Further details are recorded in the contemporary *Dialogus miraculorum* by the Cistercian monk Caesarius of Heisterbach (diocese of Cologne in Germany):

"During Advent, the Milanese heretics and those of Brescia sent many cartloads of food. And as they were banqueting on Christmas Day, the Lord shook the earth [...] The Milanese then abandoned their city, and lived for more than eight days in tents for fear of that same earthquake".

In Adventu Domini haeretici Mediolanenses haeretici qui erant in Brixia, multa plaustra cum victualibus transmiserunt. In ipsa vero die Nativitatis Domini dum conviverent,

Dominus terram concussit, [...] Mediolanenses vero civitatem suam deserentes, plus quam octo dies in tentoriis habitabant, timore eiusdem terraemotus.

The earthquake is recorded in general terms and with a reference to Brescia in notes added to a liturgical calendar dating to the late 13th century, from the church of S. Giorgio (*Notae S. Georgii Mediolanenses*).

Padua

There was an earthquake which is described as "great" (or "very great"); but no specific effects are mentioned. Of 13th century Paduan sources, the briefest is the *Liber Regiminum Paduae*, which makes use of old city annals for the period 1174-1267. But it does mention Padua by name:

"1222 [...] And the following day, which was Christmas Day, there was a great earthquake at Padua".

MCCXXII [...] Et die sequenti nativitatis Domini fuit magnus terremotus in Padua.

The other Paduan sources from the second half of the 13th century are the *Chronicon Marchiae Tarvisinae et Lombardiae* and the *Chronica in factis et circa facta Marchie Trivixane* by a notary called Rolandino. They do not mention Padua by name, but they do record earthquake effects at Brescia.

Venice

Church bells rang of their own accord. One side of the monastery of S. Giorgio collapsed. Our sources are three contemporary chronicles from German and Anglo-Saxon areas, and a note in the margin of a 14th century codex. Damage to the monastery of S. Giorgio is mentioned in a note added to the manuscript of the chronicle of Andrea Dandolo (published by Muratori, 1728, cols.343-4, note):

"Elsewhere [I have read that] in the year 1223 on Christmas Day, a Sunday, there was a great earthquake at Venice, which destroyed one side of the monastery of S. Giorgio".

Alibi anno MCCXXIII in die Nativitatis Dominicae fuit Venetiis terraemotus ingens quo unum latus Monasterii Sancti Georgii fuit dirutum.

There is a brief mention of the earthquake in the contemporary *Dialogus miraculorum* by the Cistercian monk Caesarius of Heisterbach (diocese of Cologne in Germany):

"During Advent, the Milanese heretics and those of Brescia sent many cartloads of food. And as they were banqueting on Christmas Day, the Lord shook the earth [...] at Venice [...] and in many other provinces and cities at that same time earthquakes struck terror into many people".

In Adventu Domini haeretici Mediolanenses haeretici qui erant in Brixa, multa plaustra cum victualibus transmiserunt. In ipsa vero die Nativitatis Domini dum convivarent, Dominus terram concussit, [...] in Venetia [...] et in aliis multis provinciis atque civitatibus eodem tempore multos terruerunt terraemotus.

There is general information about the earthquake in the *Chronicon Montis Sereni* (from Lauterberg in the diocese of Merseburg), compiled around 1227-30:

"1222. There was a great earthquake in all the transalpine provinces [...], as well as at Venice and in many other maritime towns. It began at midday on Christmas Day and lasted until the eighth day after that [1 January 1223]; and it caused the destruction of many buildings and great trouble for men. Then blood mixed with rain was also seen to fall".

1222. *Terre motus magnus per omnes Transalpinas provincias [...], preterea Venetiis et in pluribus aliis maritimis civitatibus factus est, qui die media natalis Domini incipiens usque in octavam eiusdem duravit, de quo multorum edificiorum ruinas et*

hominum oppressiones contigit provenire. Sanguis eciam cum pluvia postmodò descendere visus est.

There is more information in the *Annales* of Dunstable (in the diocese of Lincoln England), which record the detail of bells ringing:

"1223 [...] There was a great earthquake in various places in Italy [...] In Venice, the earth shook, to the extent that church bells rang out of their own accord, as the men had pulled on them".

1223 [...] Factus est terremotus magnus diversis locis in Italia [...] Venetiis autem a terra tremuit, quod ecclesiarum campane ex solo terre motu tamquam hominum tri sonuerunt.

Verona

All those who were in the ancient Roman arena fled outside. The only source to mention the city of Verona by name is the *Annales* compiled by the contemporary Veronese notary Parisio da Cerea:

"1223. At the third hour on 25 December, Christmas Day, there was an earthquake in Lombardy and everywhere else on earth, and all those who were in the arena of the commune of Verona for entertainment and pleasure, fled outside".

1223. 25 Decembris in festo nativitatis domini Iesu Christi hora tertiarum fuit tremotus in Lombardia undique super terram, et omnes personae quae erant in arena communis Veronae causa tripudii et solatii, fugerunt extra dictam arenam.

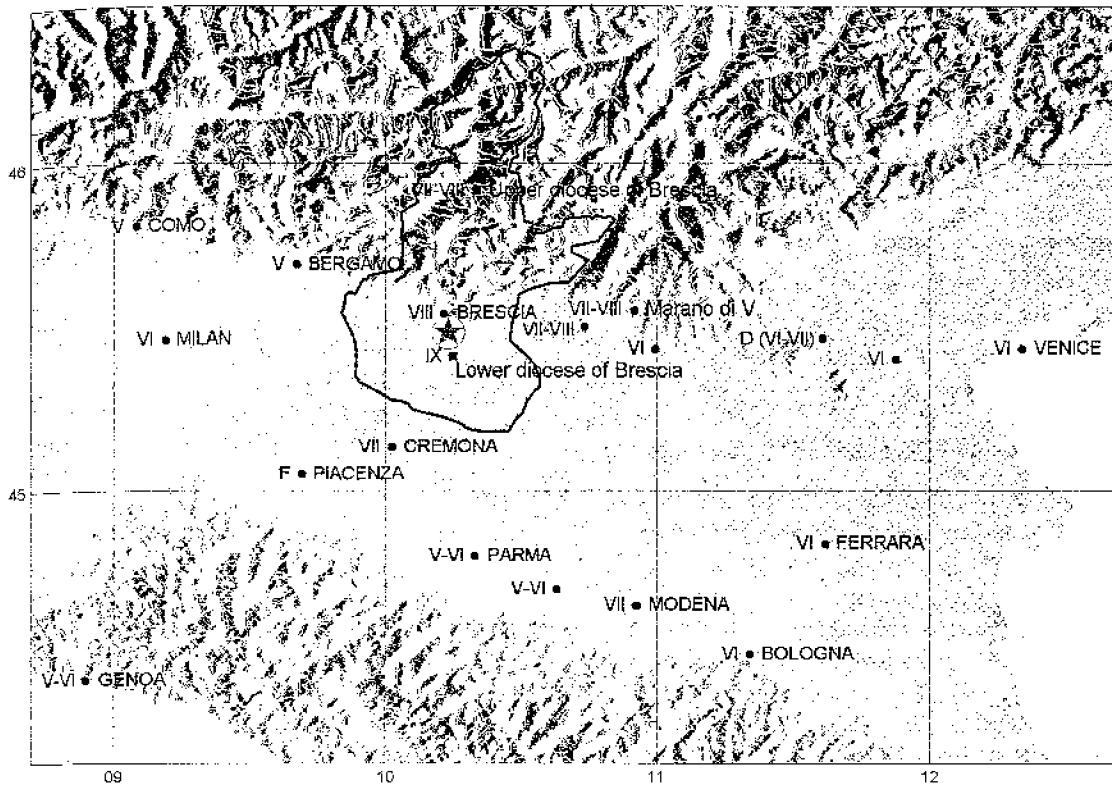
The other 13th century Veronese annals do not mention Verona, at least not explicitly, and in almost all cases the only city named is Brescia. The sources concerned are the *Annales S.Trinitatis Veronenses*, compiled from the second quarter of the 13th century onwards; the *Annales Veronenses antiqui* and the *Annales Veteres*, both of which were compiled in the second half of the 13th century. Another source is a collection in the Biblioteca Capitolare in Verona (ed. Turrini 1978-79) containing a brief version of the composition.

Genoa

The whole population was frightened, and immediately after the earthquake they gathered at the cathedral of S.Lorenzo and from there went in procession through the city. On 1 January 1223, many people abandoned the city and took refuge in the open fields for fear of fresh shocks. Our source is a long passage in the *Annales Ianuenses* (pp. 7-8), an official chronicle compiled by the notaries of the commune, in this case Marcello Scriba. Set out below are the most significant parts:

"On Christmas Day, a feast which the whole city [of Genoa] was celebrating, as all everyone was dining, to general dismay and as a punishment for evildoers, we were visited by Divine Mercy in the form of a great and dangerous earthquake. [...] When the earthquake came to an end, all the people of the city gathered faithfully and devotedly at the church of S.Lorenzo, took up the relics of St.John the Baptist and other saints and carried them round the city with great devotion and mournful chants, to ask the merciful Lord to forgive their sins".

In die nativitatis Domini, de cuius celebritate tota civitas congaudebat, ad singulorum terrorem et correctionem malorum, omnibus fere ad prandium discumbentibus, inquit ac perfido terre motu nos divina clementia visitavit. [...] post quietem cuius universus populus civitatis ad ecclesiam beati Laurentii fideliter et devote concurrans, reliquias beati Iohannis baptiste et aliorum sanctorum, quas cum summa devotior lacrimabili voce per civitatem portavit, delictorum veniam a Domino misericorditer petiturus.



1222
December 25

fig. 53 The line indicates the area covered by the ancient diocese of Brescia.

The earthquake is also mentioned in the reliable *Chronicle of Genoa* by Iacopo da Varagine (p.374), archbishop of Genoa in the second half of the 13th century: "But in the year of Our Lord 1222, on Christmas Day itself, Genoa and almost all of Italy was struck by so violent an earthquake that buildings collapsed, and in many places the earth split open, with the result that men abandoned their towns and lived in the fields".

anno autem Domini .M^o.CCXXII., in die scilicet natalis Domini, fuit Ianue et in tota fere Ytalia tam vehemens terremotus, ut hedificia caderent et terra in multis partibus scinderetur, propter quod homines civitates deserebant et in campestribus habitabant.

Parma

The population fled from the city in terror. There are no reports of damage. Our sources are the *Cronica* of the Franciscan friar Salimbene de Adam, and the *Chronicon Parmense*, a 14th century chronicle. When the earthquake struck, Salimbene was at Parma, and his account is enhanced by his personal memory of what his mother told him about it. Salimbene was born on 9 October 1221, and was hence little more than a year old at the time of the earthquake:

"In the year of Our Lord 1222 [...] And in that same year, on Christmas Day, there was a very great earthquake [...] My mother used to tell me that when this great earthquake occurred, I was lying in my cradle, and she herself picked up my two sisters one under each arm — for they were small — and leaving me in the cradle, ran to the home of her parents and brothers. For she said she was afraid that the baptistery [of Parma] would fall on top of her, since my house was close to it [...]. In the year of Our Lord 1223 messer Enrico Avvocato of Cremona was *podestà* at Parma. And at the beginning of his term of office in that year, there was a great earthquake on Christmas Day, which people later often called to mind".

Anno Domini MCCXXII [...] Et in eodem anno in nativitate domini nostri Iesu Christi fuit maximus terremotus [...] Solita erat mater mea michi referre, quod tempore istius magni terremotus iacebam in cunabulis, et ipsa accepit duas sorores meas, sub qualibet ascella unam — erant enim parvule — et me in cuna dimisso cucurrit ad domum patris et matris et fratrum suorum. Timebat enim, ut dicebat, ne baptisterium super eam caderet, quia ibi iuxta erat domus mea. [...] Anno Domini MCCXXIII dominus Henricus Advocatus de Cremona potestas Parme fuit. Et hoc anno in introitu sui regiminis fuit terremotus magnus in nativitate Domini, qui a posteris ad memoriam frequenter reducitur.

The *Chronicon Parmense*, which is based on several series of local annals, records the flight of the city's inhabitants:

"And there was a great earthquake throughout Italy in that year [1222]. It happened between the sixth and ninth hour on Christmas Day, and people fled from the city, thinking they were about to die [...]"

Et illo anno terremotus magnus per totam Ytaliam, et fuit in Nativitate Domini inter sextam et nonam, et homines fugiebant extra civitatem credentes se subito mori [...].

Reggio nell'Emilia

There was an earthquake which the sources describe as "very great", but no damage is recorded. Our sources are the *Cronica* by the Franciscan friar Salimbene de Adam, and the *Liber de temporibus* by the Reggio notary Alberto Milioli. Both these men lived in the 13th century. Since the information they provide is very similar, we quote only the text of Salimbene:

"In the year of Our Lord 1222 [...] And in that same year, on Christmas Day, there was a very great earthquake in the city of Reggio, as messer Niccolò, bishop of Reggio, was preaching in the cathedral of S.Maria. And this earthquake affected the whole of Lombardy and Tuscany".

Anno Domini MCCXXII [...] Et in eodem anno in nativitate domini nostri Iesu Christi fuit maximus terremotus in civitate Regina, predicante domno Nicholao Regino episcopo in maiori ecclesia sancte Marie. Et fuit iste terremotus per totam Lombardiam et Tusciam.

Bergamo and Como

Many people were terror-stricken. The source for both places is the contemporary *Dialogus miraculorum* by the Cistercian monk Caesarius of Heisterbach (diocese of Cologne, in Germany):

"During Advent, the Milanese heretics and those of Brescia sent many cartloads of food. And as they were banqueting on Christmas Day, the Lord shook the earth [...] In Bergamo, Como, Venice [...] and many other provinces and cities at that same time, earthquakes struck terror into many people".

In Adventu Domini haeretici Mediolanenses haeretici qui erant in Brixa, multa plaustra cum victualibus transmiserunt. In ipsa vero die Nativitatis Domini dum convivarent, Dominus terram concussit [...] In Pergamo, in Cumis, in Venetia [...] et in aliis multis provinciis atque civitatibus eodem tempore multos terruerunt terraemotus.

The *Annales Bergomates* (first half of the 13th century) record the earthquake in general terms, and make explicit reference only to Brescia:

"In the year 1222. [...] On Christmas Day in the same year at about the sixth hour, there was a very great earthquake [...]"

An. MCCXXII. [...] Eodem anno in die nativitatis Domini circa horam sextam fuit terremotus maximus [...].

Piacenza

We can deduce from two contemporary sources that the earthquake was probably felt here, without any damage being caused. The sources concerned are the *Annales Placentini* by Giovanni Codagnello, chancellor of the city of Piacenza from 1202 to 1230; and another verse composition from the Piacenza area (published by Holder-Egger 1891). The fact that verse compositions were written is evidence of the great celebrity of the event in contemporary culture.

▲ 1222 12 25 11:30-13:40 UT ★ = 45 29 10 14 I₀ = VIII Me = 6.2 Sites: 20

location	lat.	long.	I	location	lat.	long.	I
■ Lower Brescia diocese	45 25	10 15	IX	Padua	45 24	11 53	VI
Brescia	45 33	10 13	VIII	Venice	45 26	12 20	VI
■ Upper Brescia diocese	45 55	10 20	VII-VIII	Verona	45 26	11 00	VI
Lazise	45 30	10 44	VII-VIII	Genoa	44 25	08 54	V-VI
Marano di Valpolic.	45 33	10 55	VII-VIII	Parma	44 48	10 20	V-VI
Modena	44 39	10 56	VII	Roggio nell'Emilia	44 42	10 38	V-VI
Costozza	45 28	11 36	D (VI-VII)	Bergamo	45 42	09 40	V
Bologna	44 30	11 20	VI	Como	45 49	09 05	V
Ferrara	44 50	11 37	VI	Lucca	43 51	10 30	F
Milan	45 28	09 11	VI	Piacenza	45 03	09 42	F

(106) 1226 January 24 - 1227 January 23 [675 A. e.] Armenia doubtful event

inscription Barxudaryan (1973, pp.22ff. = DHV IV.42)

catalogue d. Zeyt'unyan (1991)

In the year 675 of the Armenian era [24 January 1226 - 23 January 1227], there was perhaps an earthquake at the town of Noraduz or Noratus (in present-day Armenia), but its effects are not specified. The source is an unfortunately ambiguous inscription preserved on the west side of a *khachkar* (a typically Armenian large stone stele, carved in the form of a cross; see figure on p.260).

■ The stele is now in Noraduz village, but was originally in one of the two Noraduz church complexes: St.Astvacacin or St.Gregory.

"In the name of God. In the year 675 [24 January 1226 - 23 January 1227], during the rule of *atabek* Iwan and of *shahanshah* Awag I, Mep'orelk' of Xoshak' [?], Noratus erected me, when it trembled because of the wrath of God. The sultan of Xorasan massacred many people".

Ա.ՆՈՒՄԱՐԻՆ Ա.ՅԻ : ՈՂԵ : ԹՎԻՍ. Յիշխանութեան արթաբակին եւան/ա եւ Ա.վագին շահանշահի, եւ Մեհորելի/ խոշարին անուճցածա նորատու/ կացուճց զիս./ որժամ Ա.ՅԻ.բարկութեն շահճեցաւ Սուլտանն/ Խորասանա./ կոտորաճս բազում արար.

The inscription on the south side of the *khachkar* only records the recommendations of the dedicator. That the inscription refers to an earthquake is by no means certain, for the expression "trembled because of the wrath of God" may refer to the devastation inflicted by the sultan of Xorasan; in that case, the "trembling" would refer to the fear caused by looting or, more likely, to the disastrous invasion, described as though it were an earthquake. On the other hand, it may be that the invasion followed an earthquake, taking advantage of the disorder and destruction. An earthquake at Erzincan (now in Turkey) is recorded by Arakel of Tabriz, a 17th century Armenian historian. After recording a Tartar raid at Ani in the year 675 of the Armenian era, he comments briefly: "Then, in the same year, an earthquake occurred at Eznkan, and a church collapsed". Both in this case and that of the following earthquake of 1236-1237 (see the entry concerned), the



fig. 54 Armenia: examples of *khachkars*. The term means “stone cross”, and designates a kind of tombstone that spread throughout the whole of historical Armenia from the 9th century AD. *Khachkars* were huge cross-shaped monolithic stone stelae, from 1.0 m to 2.5 m high and from 0.7 to 1.5 m wide, which were positioned vertically on the façades of churches and monasteries, or were strategically arranged in series to define the external and internal spaces of monastic sites.

sources record the collapse of a church at Erzincan. For this reason, and because of the similar way Armenian writes the numbers ՌՃԵ [655], ՌԴԵ [675] and ՌՃԸ [685], which are the dates of the three Erzincan earthquakes of 1206–207, 1226–1227 and 1236–1237, a doublet may have been created amongst the earthquakes at Erzincan in the first half of the 13th century. A comparison between the available sources makes it seem likely that the reports of earthquakes in 1226–1227 and 1236–1237 are actually referring to a single earthquake. But in our present state of knowledge, it is not possible to say which of the two really occurred. Zeyt'unyan (1991, p.89) suggests the date 1236 for this earthquake.

< 107 > **1228 July Ischia island [southern Italy]**
 > landslide <

doubtful event

source Richard S.Germ., *Chron.*, p.152

literature Mercalli (1881, 1884); Cubellis and Luongo (1998)

historiography Buchner (1986)

catalogues d. Filippo da Secinara (1652); Bonito (1691); Perrey (1848); Mallet (1853); Capocci (1861-63); Mercalli (1883); Baratta (1901)

catalogues p. Giorgetti and Iaccarino (1971); Carrozzo *et al.* (1973); Postpischl (1985)

This earthquake is not listed in currently used Italian catalogues, though it has had a place in the tradition of seismological studies from Filippo da Secinara (1652) to Baratta (1901). In Postpischl (1985), it is classified of grade VII (MCS). Precisely because of that grade VII, it was not included in the studies published in the *Catalogo dei Forti Terremoti in Italia* (Boschi *et al.* 1995, 1997, 2000), since the catalogue's epicentral intensity threshold is grade VIII. It is likely, moreover, that the event was considered doubtful or false by the compilers of the Camassi and Stucchi (1997) catalogue, and therefore eliminated. That is why it does not appear in the CPTI (1999) parametric catalogue.

The source in which it is recorded is the reliable contemporary chronicle compiled by Richard of San Germano, that being the old name for the town of Cassino, where he was born. In the second redaction of his *Chronica*, compiled when he entered the service of the emperor Frederick II, he narrates events concerning the Regno di Sicilia, to which the island of Ischia belonged. The text is brief:

“In the same month of July 1228, the mountain on Ischia collapsed and buried about seven hundred people, men and women, who lived below it”.

Eodem mense Iulii [1228] mons Iscle subversus est, et operuit in casalibus sub eo degentes fere septingentos homines inter viros et mulieres.

The text leaves us with uncertainties, however, because the reference to the landslide

on Mt. Epomeo (*mons Isclae*) is not explicitly related to an earthquake: but that relationship can reasonably be deduced from the use of the verb "*subvertere*" (to overthrow). As Mercalli (1884) pointed out, this verb was frequently used in medieval texts with reference to earthquakes. It might be objected, of course, that many medieval accounts were not concerned to identify the natural causes of the events narrated. Nevertheless, we think it of greater import that in this source the writer uses the passive form of the verb ("was overthrown"), which in itself implies that the action had an agent, even if it is not expressed. A reasonable doubt remains, on the other hand, because there have been big landslides on Mt. Epomeo resulting from erosion or collapse. However, Buchner (1986), who was aware of this, interprets the phenomenon mentioned in this source as a destructive earthquake, and thinks its location can be identified as the north-west slopes of the mountain, between present-day Casamicciola and Forio.

(108) **1231 March 11 Constantinople [north-western Turkey]**

sources 1 *Chron. min. Byz.*, 20.4 (in Schreiner 1975, p.175); *Notula* in Schreiner (1977, p.607, no.13); Richard S.Germ., *Chron.*, p.364; Acrop., *Brev.*, p.20; Scutar., *Addit.*, p.287

source 2 Pachym., *Relat. hist.*, 9.15, III, p.259

historiography Janin (1969); Müller-Wiener (1977); Schreiner (1977); Ducellier (1980)

catalogues d. Bonito (1691); Evangelatou-Notara (1993); *Papazachos and Papazachou (1997)

An earthquake described as "very great" struck Constantinople on 11 March 1231, causing the collapse of houses, churches and part of the city walls. The church of the Holy Apostles was rebuilt by the emperor John III Ducas Vatatzes (1222-1254). Information about this earthquake is to be found in Byzantine and Latin chronicles which are contemporary with the event or nearly so, and in a *Notula*. The Byzantine chronicle preserved in codex *Vat. Palatinus Graecus* 93 (Schreiner 1975, no.20) records at fol.192v: "In the year 6739 [1 September 1230 - 31 August 1231], in the third indiction, while [the city] was held by the Franks, a very great earthquake occurred and the churches and walls of the City collapsed".

τῷ εψλθ' ἔτει, ἰνδικτιῶνος γ', κατεχομένης αὐτῆς παρὰ <τῶν> Φράγγων γέγονεν ὁ μέγιστος σεισμός καὶ κατέπεσον οἱ ναοὶ καὶ τὰ τεῖχη τῆς Πόλεως.

The year of the world 6739 was in fact in the fourth rather than the third indiction.

A *Notula* at the end of manuscript Athos Philotheou 41 (Schreiner 1977, p.607, no.13, previously published in Lampros 1895-1900, I, p.153) records the day and month of the earthquake, but gives the wrong day of the week:

"It is recorded that at that time there was a great earthquake, in the year of the Creation 6739 [1 September 1230 - 31 August 1231], on 11 March, the fourth day [Wednesday], in the fourth indiction".

ἡ ἀνάμνησις καθ' ὃν χρόνον γέγονεν ὁ μέγας σεισμός ἔτει ἀπ' ἀρχῆς κτίσεως ἐν ἔτει εψλθ', μαρτίου ια', ἡμέρα δ', ἰνδικτιῶνος δ'.

In 1231, 11 March was not a Wednesday but a Tuesday. There is a probable reference to this earthquake of 1231 in Pachymeres (II, p.233), a Byzantine historian who lived in the second half of the 13th and the early 14th century. According to him, when the seismic sequence of June-July 1296 took place, elderly people in Constantinople recalled a "great earthquake". There is also a record of this earthquake in a contemporary Latin source from the Cassino area. This is the chronicle compiled by the imperial notary Richard of San Germano, according to whom:

"in the city of Constantinople there were great earthquakes which caused great devastation amongst houses and churches".

In civitate Constantinopolitana terre motus magni fuere, per quos ecclesiarum et domorum vastitas magna fuit.

This piece of information immediately follows events dated to April 1231. Scutariotes, who was metropolitan of Cyzicus in 1277-1282, and wrote shortly after the earthquake, tells of the rebuilding of the basilica of the Holy Apostles in Constantinople (Janin 1969, pp.41-50; Müller-Wiener 1977, pp.405-11), after being damaged in an earthquake:

"the holy church of the Apostles of God, having been damaged in an earthquake, enjoyed the beneficence of the emperor and with the aid of suitable funds was rebuilt".

τὸν δὲ τῶν θεοκηρύκων ἀποστόλων ναὸν ἀγιότατον ὑπὸ σεισμοῦ κινδυνεύσαντα βασιλικῶς ἐπεσκέψατο καὶ χρήμασι ἱκανοῖς ἀνακτισθῆναι πεποίηκεν.

There may be a reference to this same earthquake (and to the later one on 16 September 1237) in a remark by the contemporary Byzantine historian, George Acropolites, who also mentions environmental effects, but we do not know whether they relate to these earthquakes:

"certain terrible earthquakes which occurred, and destruction caused by cracks in the earth and boiling of the sea".

σεισμούς τινας γεγενημένους δεινοῦς καὶ τμημάτων γῆς μεγίστων κατερειπώσεις θαλάσσης τε ἐκβρασμούς.

Ducellier (1980, p.106) dates the event to April 1231, but does not make use of Byzantine sources, and considers the only evidence for it to be that provided by Richard of San Germano.

▲ 1231 03 11

localities	lat.	long.	I
Istanbul	41 02	28 57	VII-VIII

< 109 > 1231 June 1 San Germano [central Italy]

▷ fissures, clouding of springs ◁

sources Richard S.Germ., *Chron.*, p.174; *Regesto di Tommaso Decano*, pp.74-6

historiography Girardi (1663); Tovazzi (ed. 1986); Tosti (1843); Moroni (1840-79); Camera (1860); De Marco (1888); Perrella (1890-91); Magliano (1895)

literature Molin and Guidoboni (1989)

catalogues d. Bonito (1691); Pilla (1837); Perrey (1848); Mallet (1853); Capocci (1861-63); Mercalli (1883); Baratta (1899, 1901); Galli (1906); Milne (1911); Paoloni (1913-14); Grumel (1958); *Boschi *et al.* (1995, 1997, 2000)

catalogues p. Giorgetti and Iaccarino (1971); Carrozzo *et al.* (1973); Dell'Olfo and Molin [1980]; CPTI (1999)

On 1 June 1231, towards midday, there was a strong earthquake in the area of San Germano (present-day Cassino), where a large piece of stone fell at the Roman theatre. Serious damage is recorded, but it is not possible to put place names to the general term "towns and castles" where, we are told, there were collapses affecting church towers, churches themselves, other towers, and many houses. The earthquake was felt as far away as Rome and Capua. There was also some fissures, and springs at Cassino became cloudy for two hours. There are no reports of victims. Local people were obliged to live out in the open because of the frequent aftershocks, which lasted for more than a month. The area worst affected was partly in the Papal States (from Rome to Cassino, where the abbey and surrounding territory were directly subject to the pope), and partly (from Cassino to Capua) in the Kingdom of Sicily, which was then ruled over by Frederick II of Swabia. Primary evidence for the earthquake is to be

found in the reliable chronicle of Richard of San Germano, a notary and one of the principal 13th century historians of the abbey there:

"The year 1231 [...]. On Sunday, the first day of the month of June, at about midday, a great earthquake suddenly struck San Germano and neighbouring places, causing the collapse on that single day of quite a few church towers and even the churches themselves, as well as strong towers and a number of houses in towns and castles. And, strange to say and hear, it shook the earth to its foundations, and turned the clear waters of San Germano's springs the colour of stinking faeces, and the water kept that colour for almost two hours. Because it split open rocks, men feared that they would be swallowed up alive, and so they were filled with great contrition and mournful penitence, and recommended their souls to the Lord in their fear of death. On the day and at the time I have mentioned, the earthquake resounded from Capua to Rome, and the earth shook. And a large piece of stone was torn off the Colosseum at that time; and since the earthquake continued in this way for more than a month, sometimes stronger and sometimes weaker, men were so frightened that they abandoned hearth and home and fled into the fields, for fear of being buried in the ruins of their houses. Then, led by Landulph, the abbot of Cassino, a general procession was made from his own individual lands to the monastery of Cassino, barefoot, and with weeping and lamentation. On the very day of this earthquake, pope Gregory left Rome and went to Rieti; he was met by the archbishop of Bari and the head of the house of the Germans on behalf of the emperor, and the bishop of Modena was appointed by the pope as nuncio at the imperial court".

Anno 1231 [...]. Mense Junii primo die circa meridiem, qui erat dies Dominicus, terre motus magnus factus est subito in Sancto Germano et per vicina loca, qui die ipso nonnulla ecclesiarum campanilia, ipsae etiam ecclesias, firmas turres et domos plurimas in civitatibus et castellis evertit, qui quod dictu et auditu mirabile est, terre fundamentis concussis limpidos aquarum fontes de Sancto Germano in fecis fetulente colorem mutavit, et talis color aquarum per duas ferme horas duravit, saxa dirupit, propter quod homines timentes vivos a terra sorberi, in multa contritione et luctu penitentiam agentes, suas Domino pre timore mortis animas commendabant. Terre motus iste intonuit die illo et hora predicta, a Capua usque Romam, et terra mota est. Et tunc de Coliseo concussus lapis ingens eversus est; et quia duravit ultra mensem terre motus huiusmodi, interdum plus interdum minus, attoniti homines, dimissis laribus et lociis propriis, ne domorum illos ruina contereret, ad agros exibant. Tunc iussu Landulfi Casinensis abbatis fit ad Casinense monasterium de singulis terris suis processio generalis discalciatis pedibus in fletu et planctu.

Ea die qua terre motus iste fuit, Gregorius papa Urbem exiens vadit Reate; ad quem Barensis archiepiscopus et magister domus Alamannorum ex parte imperatoris vadunt, et Mutinensis episcopus a papa ad imperatorem nuntius destinatur.

Mention of a large piece of stone falling from the "Colosseum" caused later chroniclers to suppose that the building in question was the Flavian amphitheatre in Rome. However, the Cassino historian Paoloni (1913-14) put forward the completely convincing suggestion that the "Colosseum" referred to was actually the Roman amphitheatre at Cassino, which was still known as the "Colosseum" in the early twentieth century. In 1757, a large piece of stone, bearing a Roman inscription, was found in the orchestra area, and it has been suggested that this was the piece of stone which fell in the 1231 earthquake (Paoloni 1913-14). An examination of the available documents has not produced direct evidence of possible damage to Cassino monastery buildings. We examined the papal diplomas in the *Regesta pontificum romanorum* (1198-1304), the letters of Gregory IX (1224-1241), and the regests in the 13th century archives of Montecassino. A few references to the need for repairs to some monastery buildings have been found in a document dated 11 August 1242 in the *Regesto di Tommaso Decano* (XLV, pp.74-6). This is a copy of the will of Roffredo de Monte, drawn up in 1238, in which it is set down

that part of his inheritance shall be spent "on repairs to dwellings inside the Cassino monastery, to be carried out by the dean and vice-dean of Cassino".

Reliquum vero quod de ipsis rebus haberi et percipi poterit, volo et ordino quod expendatur in reparatione domorum que sunt intus monasterium casinense, per manus decani et vicedecani casinensis.

It has to be said, however, that there is no specific connection to earthquake damage (Molin and Guidoboni 1989). Cassino documents dating to the months following the earthquake do not reveal any state of emergency, and the abbey's documented affairs are simply everyday business. Furthermore, all deeds dating to the years 1231-1234 bear the phrase in the Cassino monastery (*in monasterio casinense*), thus indicating that the monastery was active and inhabited at the time.

▲ 1231 06 01 11:00 UT Sites: 3

location	lat.	long.	I	location	lat.	long.	I
Cassino	41 29	13 50	VIII EE	Rome	41 54	12 29	F
Capua	41 06	14 13	F				

< 110 > 1236 January 22 – 1237 January 20 [685 A. e.]

Erznka [eastern Turkey]

source 1. *Chron. min. Arm.*, II.4, p.139

sources 2. *Chron. min. Arm.*, II.11, p.264; colophon in Yovsep'ean (1951, no.86, fol.207); Ar. Tabr., *Book*, p.469

historiography Incicean (1822); Kostaneanc' (1902)

literature Abich (1882)

catalogues d. Sieberg (1932a); Grumel (1958); Step'anyan (1964); Zeyt'unyan (1991); Evangelatou-Notara (1993)

catalogues p. Ergin *et al.* (1967); Karapetian (1991)

In the year 685 of the Armenian era (22 January 1236 – 20 January 1237), a strong earthquake struck Erznka (present-day Erzincan), causing the church of St. Gregory to collapse. There is evidence for the earthquake in what are known as the *Annals of the Anonymous of Sivas* (*Chron. min. Arm.*, II.4), where we read:

"In 685 [22 January 1236 – 20 January 1237], Eznkay [Erznka] trembled and the church of St. Gregory collapsed".

ՈճԵ շարժեցաւ եզնկայն և ի սուրբ Գրիգոր եկեղեցի[ն] փլաւ.

There is another source for the earthquake in a colophon in Yovsep'ean (1951, no.86, fol.207), which contains the historical narrative of Kyriakos. Within this narrative is a chronicle for the years 1018-1603, which records: "In the year 685 [1236-7] there was an earthquake at Eznган [Erznka]. A church collapsed".

Ի ԹՎԻՆ ՈճԵ շարժ ելաւ յեզնկան. մի եկեղեցի փլաւ.

Thus the sources recorded the collapse of a church at Erzincan in relation both to this earthquake and to the earlier one of 1226-1227. For this reason, and because of the similar way Armenian writes the numbers ՈճԵ [655], ՈճԵ [675] and ՈճԵ [685], which are the years of the three Erzincan earthquakes of 1206-1207, 1226-1227 and 1236-1237, there may be a doublet amongst the earthquakes recorded for Erzincan. A comparison between the available sources makes it seem quite likely that the reports of earthquakes in 1226-1227 and 1236-1237 are in fact referring to a single event. Moreover, the colophon in Yovsep'ean (1951, no.86, c.207) contains separate reports for the earthquakes of 1206-1207 and 1236-1237, but does not mention the event of 1226-1227. In

our present state of knowledge, therefore, it is not possible to say with any certainty which of the two really occurred. Sieberg (1932a, p.40) suggests that the epicentre was located in northern Syria, but produces no explicit supporting evidence. Evangelatou-Notara (1993, p.24, note 6) relates this earthquake to the one at Constantinople on 16 September 1237, but there is no evidence to support her suggestion.

▲ 1236 01 22 – 1237 01 20 [685 A. e.]

localities	lat.	long.	I
Erzincan	39 44	39 30	VIII-IX?

< 111 > **1237 September 16 Costantinople? [north-western Turkey]**

source 1 *Notula* in Hutter (1982, p.155), previously in Joannou (1958, p.10, no.1)

source 2 Acrop., *Brev.*, p.20

catalogue d. Wirth (1966); Evangelatou-Notara (1993)

On 16 September 1237 an earthquake described as "great" was felt, presumably at Constantinople. Its effects are not specified. Information about this earthquake is to be found in greek manuscript Holkham 29, at fol.141v., in Bodleian Library, Oxford, published in Hutter (1982, p.155):

"on 16 of the month of September, in the thirteenth indiction, in the year 6746 [1 September 1237 – 31 August 1238], during the reign of John and Irene, and that of the most holy and ecumenical patriarch Germanus, there was a great earthquake".

μη(νι) σεπτεμβρίῳ ις' ἰν(δικτιῶνος) ιγ' ἔτει ρσψμς' ἐπὶ τ(ῆς) βασιλείας Ἰω(άννου) καὶ Εἰρήν(ης) [καὶ ἀγιωτάτου (καὶ) οἰκουμενικοῦ π(ατ)ριάρχου κϋρ Γερμανοῦ ἐγένετο ὁ μέγας σεισμός.

The year of the world 6746 fell not in the thirteenth but in the eleventh indiction. The emperor referred to is John III Ducas Vatatzes (1222-1254).

There may perhaps be a reference to this earthquake in a laconic remark by the Byzantine historian George Acropolites, a contemporary writer — the remark already mentioned in connection with the earthquake of 1231.

▲ 1237 09 16

localities	lat.	long.	I
Istanbul	41 02	28 57	VI-VII?

< 112 > **1247 spring Tzouroulos [north-western Turkey]**

source Scutar., *Addit.*, p.284

catalogue d. Evangelatou-Notara (1993)

In the spring of 1247, there was an earthquake at Tzouroulos, a town in Thrace (present-day Corlu, in Turkey). Its effects are not specified. Information about this earthquake is to be found in Scutariotes, who was metropolitan of Cyzicus in 1277-1282, and a contemporary author. He writes incidentally:

"but God [...] with a sudden movement, shook the earth".

ἀλλ' ὁ Θεὸς [...] κλόνῳ συσσειγᾶς τὴν γῆν.

The historical background is the siege of the town of Tzouroulos in Thrace by the emperor John III Ducas Vatatzes (1222-1254).

▲ 1247 spring

localities	lat.	long.	I
Corlu	41 09	27 48	F

< 113 > **1249 September Modena [northern Italy]**

sources Milioli, *Liber*, p.520; Salimb. Adam, *Cron.*, p.332

historiography Sigonio (1591); Vedriani (1666-67); Panciroli (1846-48)

catalogues d. Bonito (1691); Reginus (1880); Mercalli (1883); Baratta (1899, 1901); Alexandre (1990);
*Boschi *et al.* (1995, 1997, 2000)

catalogues p. Giorgetti and Iaccarino (1971); Carrozzo *et al.* (1973); Postpischl (1985); CPTI (1999)

On an unspecified day in September 1249, somewhere between 14:00 and 17:00 UT (between the ninth hour and vespers), Reggio nell'Emilia was struck by an earthquake which the sources define as "great". It is more difficult to assess information about Modena where, according to a 16th century historian (Sigonio 1591), a very strong earthquake "shattered all the roofs in the city". There is evidence for effects at Reggio Emilia in two 13th century sources, both of which provide the same information. They are the *Liber de temporibus et aetatibus*, and the *Chronica* of the authoritative Parma chronicler Salimbene de Adam. The *Liber de temporibus* is attributed to Alberto Milioli, a notary, but he was probably just the copyist. It is also known as *Memoriale Potestatum Regiensium*, a title given to it in Volume VIII of the *Rerum italicarum scriptores* (1726) by Muratori, who only published the second part. The text is as follows: "1249. [...] And in the month of September between the ninth hour and vespers there was a great earthquake".

In millesimo CCXLVIII. [...] Et de mense September inter nonam et vesperam terremotus magnus fuit.

The same information is recorded in the *Chronica* of Salimbene de Adam, an authoritative chronicler:

"In the same year [1249] in the month of September between the ninth hour and vespers there was a great earthquake".

Item eodem anno in mense Septembris inter nonam et vesperam terremotus magnus fuit.

Although Baratta (1901) knew these sources, he preferred to give greater prominence to the record of the event as it appears in Bonito (1691). A first-hand check on Bonito's text, however, has revealed that the source quoted by Bonito is not a work by Baronio (as Baratta claims), but one by Carlo Sigonio (1591), a Modenese historian who lived between 1520 and 1584. According to Sigonio, Modena was besieged by the Bolognese in 1249: "[...] there was a sudden earthquake with a very strong shock which shattered all the roofs in the city".

[...] repentinus quoque terraemotus effecit, qui vehementissimo concussu prope tecta urbis omnia labefecit.

In the earliest Bolognese chronicles, namely those of Pietro and Floriano Villola, written in the 14th century, we find a report that the Bolognese besieged Modena for five weeks in September 1249, digging tunnels and erecting war machines to bombard the city with great quantities of stones. The Bolognese chronicles not only do not record any earthquake for that year, but they lay emphasis on the efficiency of their war machines. Sigonio does not seem to be aware of this last piece of information; and it is fairly understandable that Bolognese chroniclers should wish to attribute the success of the siege solely to military skill and preparation, rather than to the effects of the earthquake. At

the same time, however, we must give due weight to Sigonio's words, for he may have made use of lost chronicle sources — no doubt of Modenese bias — in which the earthquake was given as the only reason for the city's defeat and the damage to roofs.

▲ 1249 09 -

location	lat.	long.	I	location	lat.	long.	I
Modena	44 39	10 56	VII-VIII	Reggio nell'Emilia	44 42	10 38	V

< 114 > c.1250-1260? Galaxidi [Greece]

source 2 Chron. Galax., p.200

historiography Sathas (1865)

catalogues d. Perrey (1850); Mallet (1853); Schmidt (1881); *Galanopoulos (1981)

catalogue p. Papadopoulos (2000)

The *Chronicle of Galaxidi*, compiled in March 1703 by the hieromonk Euthymius on the basis of earlier texts, now lost, records a "terrifying" earthquake which caused the collapse of churches at Galaxidi (present-day Galaxidhion), a town in Phocis on the northern coast of the Gulf of Corinth, in Greece. The inhabitants asked the despot Michael for a church to be built:

"And in the very years I am considering, the inhabitants of Galaxidi lost their churches, which collapsed in a terrifying earthquake, and they asked the despot Michael to build them a church".

Ἐκεῖνα γοῦν τὰ χρόνια, ποῦ ἀφηγοῦμαι, οἱ Γαλαξειδιῶται ἔσποντας νὰ πέσουν αἱ ἐκκλησίαι ἀπὸ ἓνα σεισμὸ φοβερῶτατον, ἐπαρακαλέσασι τὸν δέσποταν Μιχαήλ νὰ κτίσῃ μίαν ἐκκλησίαν.

Dating this event is very problematical. The editor of the text, Sathas (1865), dates the earthquake to around 1204, because it is recorded before the taking of Constantinople by the Crusaders (13 April 1204). Schmidt (1881, p.156), Galanopoulos (1981, p.693) and (Papadopoulos 2000, p.48) date it to about 1147 as a result of a hasty reading of the *Chronicle* (the paragraph opens with an event dated to 1147). However, there is at least some internal evidence which allows us to give the earthquake an approximate date. Initially, one is tempted to identify the "despot Michael" in the text as Michael I Comnenus Ducas (who died in late 1214). The reference to the earthquake is indeed preceded by an account of events in 1147, and is followed by a report of the taking of Constantinople by the Latins (April 1204) and of the battle between Michael I Comnenus Ducas and Thomas I d'Autremencourt (between 1210 and 1214). The request by the people of Galaxidi to the despot Michael must naturally have been made after his arrival in the region (1207). On the basis of the little information to be gained from such a late text as the *Chronicle of Galaxidi*, one might conclude that the earthquake occurred around 1200. Some time later (after 1207 and before 1210-14), the townspeople asked Michael I, the new lord of the region, for help towards reconstruction work.

A careful reading of the paragraph in question, however, shows that the chronicler is confusing Michael I with Michael II Ducas Comnenus (c.1249-1267/8), since he talks immediately after the earthquake about Theodora Petraliphina, the wife of Michael II, making use of the *Life* written by Job Iasites. Since this earthquake is only mentioned by such a late source as the *Chronicle of Galaxidi*, an assessment of it remains problematical. We think the author may have confused people and events (in both the early part and the second half of the 13th century) because he was dealing with a fragmentary text deriving from a variety of sources. Consequently, doubts remain as to the date of the earthquake, and it seems unlikely that the matter can be cleared up without other sources.

▲ c.1250-1260?

localities	lat.	long.	I
Galaxidhion	38 23	22 23	IX?

< 115 > 1254 October 11 Erzinka [eastern Turkey]

▷ surface faulting, landslides, formation of a lake ◁

- sources 1 Will. Rubruck, *Itiner.*, pp.326-7; Mxit' Ayriv., *Hist.*, p.67; *Chron. min. Arm.*, II.4, p.141; Am. Erznga, *Chron.*, in Yerevan ms. 10.200, fol.385v.
- sources 2 *Chron. min. Arm.*, II.11, p.264; Ar. Tabr., *Book*, p.469
- historiography Incicean (1822); Kostaneanc' (1902)
- literature Abich (1882); Ambraseys and Melville (1995); Ambraseys and Jackson (1998)
- catalogues d. von Hoff (1840); Perrey (1850); Mallet (1853); Kostaneanc' (1902); Grumel (1958); Step'anyan (1964); Zeyt'umyan (1991)
- catalogues p. Ergin *et al.* (1967); Karapetian (1991); Shebalin and Tatevossian (1997)

On 11 October 1254, a strong earthquake caused widespread destruction at Erzinka (now Erzincan). Sebaste (present-day Nixsar), a town more than 200 km west of Erzincan, was also struck, but we do not know the exact extent of effects there. The earthquake had substantial environmental effects in the region west of Erzincan: there was surface faulting along a segment of the North Anatolian fault zone, and landslides obstructed valleys. Near Kose Dag, a lake was also created, probably as a result of a landslide blocking the course of a river. The destruction at Erzincan is recorded by Mxit'ar of Ayrivank', a 13th century Armenian historian, whose chronicle tells us: "Eznkay [Erzinka] was destroyed in an earthquake".

Շարժմամբ կործանեցայ եզնկայն

There is information about both Erzincan and Sebaste in what are known as the *Annals of the Anonymous of Sivas* (*Chron. min. Arm.* II.4), where we read:

"In the year 703 [17 January 1254 – 16 January 1255], there was an earthquake at Eznkay and Sewast [Sebaste], on Sunday 28 *Ahekan* [11 October], a question that has four aspects[?]. Eznka suffered damage and 16,000 people died there".

Ի թիւ 24 շարժ եղև Ե ի՞նչ յաջկի և ի ժեհ հնկունքերի, հարց որ ի քառակերպեան. 3եզնկան արար վնաս և մեռան ժՁռ մարդ.

Environmental effects west of Erzincan and in the Kose Dag area are reported by a primary source in the person of William of Rubruck, a Franciscan friar who passed through the area in February 1255, about five months after the earthquake:

"[...] On the second Sunday in Lent [21 February 1255] we reached the headwaters of the Araxes [Aras River]; and after crossing the ridge of the mountain we arrived at the Euphrates and followed it downstream for eight days, constantly heading west, as far as a fortress called Camath [Kemah]. Here the Euphrates veers southwards, in the direction of Halapia [Aleppo], while we crossed the river and headed west among very high peaks and very heavy snow. That year such a severe earthquake occurred here that in one city, called Arsengen [Erzincan], there perished 10,000 people identifiable by name, not counting the poor, of whom there was no record. As we rode along for three days we saw a fissure in the earth, exactly as it had been split open in the earthquake, and piles of earth that had slid down from the mountains and filled the valleys [...]. We passed through the valley where the sultan of Turkey was defeated by the Tartars [...] In the plain where this fight [...] occurred, a great lake had welled up in the course of the earthquake".

Venimus autem secunda dominica in quadragesima ad capud Araxis, et transacto vertice montis, venimus ad Eufratem, iuxta quem descendimus octo diebus semper

tendentes in occidentem usque ad quoddam castrum quod dicitur Camath. Ibi flectitur Eufrates ad meridiem versus Halapiam. Nos autem transeuntes flumen tendebamus per altissima montana et per maxima nives in occidentem. Ibi fuit tantus terre motus in illo anno quod in una civitate, que dicitur Arsengen, furent perditæ X milia personarum notarum ex nomine, exceptis pauperibus, quorum non erat notitia. Tribus diebus equitantes vidimus hyatum terre, prout fissa fuerat in motu, et aggeres terre qui defluerant de montibus et impleverant valles [...]. Transivimus per vallem in qua victus fuit Soldanus Turkie a Tartaris. [...] In illa planicie in qua fuit illud bellum [...] eruperat quidam magnus lacus in terre motu.

William of Rubruck then went on to the town of Sebaste. Since he does not mention damage to buildings there, it is reasonable to suppose that the town did not suffer substantial damage. The battle between Turks and Mongols to which William of Rubruck refers took place on 26 June 1243 near Kose Dag. According to Ambraseys and Melville (1995, p.339), the effects on the terrain observed by William of Rubruck stretched for about 50 km along a segment of the North Anatolian fault zone to the west of Erzincan. They also suggest that the surface faulting reached as far as Erzincan, which was in the major damage zone, over a total distance of about 150 km. Kostaneanc' (1902, p.10; 21), followed by Step'anyan (1964, p.60; he identifies two separate events) and Ergin *et al.* (1967, p.17, no.153), wrongly dates the event to 1251. This is probably due to a hasty reading of Mxit'ar of Ayriyank', who does not provide a very specific chronological context.

▲ 1254 10 11 Sites: 2 EE: 1

location	lat.	long.	I	location	lat.	long.	I
Erzincan	39 44	39 30	X?	■ Kose Dag area	40 06	37 58	EE
Niksar	40 36	36 58	X?				

< 116 > 1255 November 17 or 1256 May 17 Messina [Sicily, Italy]

source Notula in Evangelatou-Notara (1984, p.63, no.203)
 literature Guidoboni and Traina (1996); Valensise and Guidoboni (2000)
 catalogues d. Evangelatou-Notara (1993)

This earthquake is unknown to the seismic catalogue tradition. On 17 November 1255 or 17 May 1256, at about 10:00 *ur* (the fifth hour), there was an earthquake described as "great and dreadful", which struck Messina (in Sicily). This earthquake is recorded in Evangelatou-Notara (1984, p.63, no.203), as well as in her catalogue of earthquakes in the Byzantine area or for which the sources are in Greek (Evangelatou-Notara 1993, p.25), but was not previously known to the tradition of seismological studies. It is mentioned by Guidoboni and Traina (1996, pp.1215-6), within the framework of a review of earthquakes in Sicily up to the end of the 13th century. The source is a *Notula* in ms. 103 in Biblioteca Universitaria at Messina, formerly belonging to the church of S.Salvatore at Messina. It is to be found at fol.55v., and records: "On that same day, 17, the fourth day of the week [Wednesday], at the fifth hour, there was a great and dreadful earthquake, which caused the foundations of the earth to shake, in the year 6764 [1 September 1255 - 31 August 1256], in the fourth indiction [actually the fourteenth]".

Τῇ αὐτῇ ἡμέρᾳ εἰς τὰς ιζ', ἡμέρᾳ δ', ὥρᾳ ε' ἐγένετο σισμός μέγας καὶ φοβερός ὥστε σαλευθῆναι τὰ θεμέλια τῆς γῆς αψξδ' ινδ. δ'.

There is nothing in the *Notula* to help us establish the location of the earthquake, but on the basis of where the manuscript was written, we may suppose that it was felt in Messina. Within the span of the fourteenth indiction (1 September 1255 - 31 August 1256), only 17 November 1255 and 17 May 1256 fell on a Wednesday.

▲ 1255 11 17 10:00 UT
 localities lat. long. I
 Messina 38 11 15 33 VI-VII?

< 117 > 1258 February 19 Barrea [Abruzzo, central Italy]

sources 1 AAAbbMontecassino, aula II, caps.XXI, parchment no.1, Letter, [1260]; *Cron. Suess.*, p.55

source 2 *Ann. Reat.*, p.267

historiography Capasso (1874); Leccisotti (1971)

This earthquake is unknown to the seismic Italian catalogue tradition.

On 19 February 1258, at about 16:30 UT (shortly before sunset, i.e. at about 17:30 local time), an earthquake probably struck the village of Barrea (in the present-day province of L'Aquila), where the walls of the church of S.Tommaso partly collapsed. Sessa Aurunca (a Campanian town in the present-day province of Caserta) was also affected, as were other unspecified places in the area. A strong shock at Sessa Aurunca caused the bells of the churches of S.Germano and S.Matteo to ring; and in other nearby unspecified places there was fairly serious damage. The information about Barrea is recorded in a document of about 1260 which refers to indulgences granted by the bishop of Trivento (now in province of Campobasso) for the restoration of the church of S.Francesco at Barrea, which had been damaged in an earthquake. This is presumably a reference to the earthquake recorded in the *Cronicon Suessanum*, although no specific date is given. The document is in the Archivio dell'Abbazia of Montecassino (aula II, caps. XXI, parchment no.1; a regest in Leccisotti 1971, p.169). The text is as follows:

"Friar Luca, by divine mercy humble bishop of Trivento. To all and to those who read this present letter, greetings and the true love of God. Since part of the church of S.Tommaso at Barregio [Barrea] collapsed in an earthquake and its walls were almost destroyed and the funds earmarked for the restoration of the church are insufficient, in the name of our love of God we advise and exhort that for the restoration of the said church we should offer not only the goods that we have gathered for God, but also charitable offerings made by individuals. We trust indeed in the compassion of God and the intercession of Saint Nazarius and Saint Celsus, and to all those who offer assistance and support for the restoration and administration of the said church, exemption from forty days of penitence shall be granted in the name of God's mercy".

Frater Lucas miseratione divina humilis Treventanus episcopus, universis presentes litteras inspecturis salutem et veram in Domino charitatem. Cum quedam pars ecclesie Sancti Thome de Barregio ex supervenienti terremotu corruerint et ipsius menia fere fuerint concussa et ad ipsius ecclesie refectionem preposite non suppetant facultates dilectionem nostram monemus et ortamur in Domino quatenus ad ecclesie predictae refectionem tam de bonis nostris a Deo nobis collatis quam de personis pia subsidia porrigatis. Nos vero de Creatoris benignitate confisi et beatorum martirum Nazarii et Celsi patrociniis querelantes omnibus porrigentibus ausilia et favorem quibus predicta ecclesia reficiatur ac etiam gubernetur, quadraginta dies de iniuncta sibi penitentia in Domino misericordiam relaxamus.

The information about Sessa Aurunca comes from the *Cronicon Suessanum*, an anonymous chronicle of that town:

"In the year of Our Lord 1258. On Tuesday 19 February after compline and shortly before sunset there was a large and impressive earthquake at Sessa and in almost all the other towns, and in some it caused a considerable amount of damage, and so the bells of the monastery of San Germano and of the church of San Matteo rang of their own accord, such was the extraordinary shaking of the said earthquake [...]"

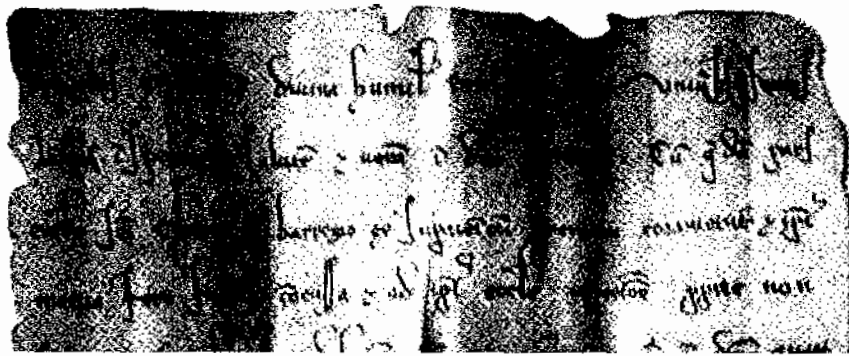


fig. 55 Parchment, 1260 c.: an indulgence granted by the bishop of Trivento (now in the province of Campobasso, southern Italy) to those contributing to the restoration of the church of S. Francesco at Barrea, which had been damaged in the earthquake of 19 February 1258 (Archivio dell'Abbazia of Montecassino, parchment no.386).

Anno Domini MCCLVIII. Die Martis XIX mensis Februarii post completorium parum ante occasum Solis fuit magnus, et manifestus terremotus Suessae, et fere in omnibus aliis Civitatibus, et in quibusdam satis damnum attulit, ita quod Campanae Monasterii Sancti Germani, et Ecclesiae Sancti Matthaei propter nimiam impulsione[m] dicti terraemotus ex se sonaverunt [...].

19 February was indeed a Tuesday in 1258. There is a very generic reference to earthquakes in Italy in 1258, without any indication of the day or month, in the *Annales Reatini*, a short 15th century chronicle.

▲	1258 02 19	16:30 UT						
location	lat.	long.	I	location	lat.	long.	I	
Barrea	41 45	13 59	A (IX)	Sessa Aurunca	41 14	13 56	V	

< 118 > **1258 December 29 – 1259 December 17 [657 H.] Cairo [Egypt]**

sources al-Maqrizi, *al-Suluk*, I, p.420; BNFrance, ms. Ar. 1597, Ibn Duqmaq, *Nuzhat*, fol.117r; al-'Ayni, *Iqd*, I, p.224; al-Suyuti, *Husn*, II, p.295; al-Suyuti, *Kashf*, p.50

literature Taher (1979)

catalogues d. Sieberg (1932a); *Ambraseys *et al.* (1994)

catalogues p. al-Hakeem (1988)

In the year of the Hegira 657 (29 December 1258 – 17 December 1259), Cairo and other Egyptian territory was struck by several strong earthquakes. No damage is recorded. The principal source for this earthquake is the reliable Arab geographer from Cairo, al-Maqrizi (1364-1442): "In that year [657 H. = 29 December 1258–17 December 1259], Egypt was struck by a series of earthquakes. People were also frightened by news of the arrival of the Mongols in Syria".

فيها حصلت بالديار المصرية زلازل عظيمة جدا وتسامع الناس بمجيء الطر لقمند الشام فانزعجوا بسبب ذلك.

The Egyptian Arab historian Ibn Duqmaq (1349-1406) adds the information that there were also numerous shocks in Syria, but he is probably combining two separate earthquakes into a single event (see the next entry): "In this year, there was a violent earthquake in Cairo and the other Egyptian territories, and there were numerous shocks in Syria at the time when the Tartars arrived, for they crossed the Euphrates and invaded the region of Aleppo, and many citizens of Damascus fled and put their goods up for sale;

and wandered around in terror, and scattered through the meadows and mountains, and some of them made their way towards Egyptian territory. It was midwinter, and many died of cold, and others were robbed as they travelled”.

فيها حصل بمصر وسائر الديار المصرية زلزلة عظيمة وفيها كثرت الازاجيف بدمشق بجيء التتار لانهم قد قطعوا الفرات واغاروا على بلاد حلب فهرب كثير من اهل دمشق وباعوا حواصلهم وخرجوا على وجوههم خائفين متفرقين في البراري والجبال ومنهم من توجه الى الديار المصرية وكان ذلك في وقت الشتاء فمات خلق كثير من البرد نهب اخرون في الطريق*.

There is a brief reference to the earthquake in the chronicle in Arabic by al-'Ayni (1361-1451), a Turkish historian: "There was a very violent earthquake in Egyptian territory, and people heard the news that the Tartars were making for Syria”.

منها : انه حصلت بديار مصر زلزلة عظيمة جدا، وتسامع الناس بمجيء التتار لقصد شام فانزعجوا بسبب ذلك وبالله المستعان.

Finally, the famous Cairo historian al-Suyuti (1445-1505) records: "In the year 657 (H = 29 December 1258 – 17 December 1259), there was a very violent earthquake in Egyptian territory”.

في سنة سبع وخمسين حصلت بديار مصر زلزلة عظيمة جدا.

According to Ambraseys *et al.* (1994) this is a doubtful event. In our opinion there is no evidence for its having at least affected Cairo, but we have nothing on which to base an assessment of effects.

▲ 1258 12 29 – 1259 12 17 [657 H.]

localities	lat.	long.	I
Cairo	30 08	31 15	NC

< 119 > 1259 March 22 Damascus [south-western Syria]

sources al-Maqrizi, *al-Suluk*, I, p.426; BNFrance, ms. Ar. 1597, Ibn Duqmaq, *Nuzhat*, fol.117r.; Ibn al-Dawadari, *Kanz*, VIII, p.44

literature Taher (1979)

catalogues d. Sieberg (1932a); *Ben-Menahem (1979)

catalogues p. Peiric and Taher (1980); al-Hakeem (1988)

On 22 March 1259, Damascus — then occupied by the Tartars — was struck by a violent earthquake which caused widespread collapses. The sources record that the arrival of the Tartars was accompanied by numerous shocks in Syrian territory.

At this same period, there was also a strong earthquake in Egypt (see the previous entry). The two events are treated separately by al-Maqrizi (1364-1442), a reliable Arab geographer from Cairo, whereas other sources record both together, there reducing to one what seem to be two quite distinct earthquakes. Al-Maqrizi records "The emirs Badr al-Din Muhammad ibn Qarmaja, governor of the citadel of Damascus and Jamal al-Din ibn al-Sayrafi had risen in rebellion and closed the gates [of the citadel] Kitbuga [a Mongol general] laid siege to the citadel with his men on the night of *Ra II* [22 March]. God sent rain, cold, wind, thunder and lightning, and an earthquake which caused collapses in many places. The populace spent the night amidst fear of the earth and fear of the heavens, and the revolt failed”.

الأمير بدر الدين محمد بن قرمجا والتي قلعة دمشق هو والأمير جمال الدين الصيرفي وأغلقت أبوابها وحضر كتبغا من عساكر التتار وحسروا القلعة في ليلة ادمس من ربيع الآخر فبعث الله مطرا وبردا مع ريح شديدة ورعود وبروق وزلزلة ط فيها عدة اماكن وبات الناس بين خوف ارضي و خوف سمائي فلم ينالوا من عة شيئا.

On 20 February 1264, Egypt was struck by a strong earthquake which caused damage. The Egyptian Arabic sources which record the earthquake do not specify where the damage occurred. The reliable historian al-Yunini (1334-1405) writes: "On Tuesday 20 *Rabi' II* in this year [662 H. = 20 February 1264], there was a very violent earthquake which aroused great fear and destroyed some houses".

وفيهما وفي يوم الثلاثاء العشرين من ربيع الآخر جاءت زلزلة عظيمة جدا ازعجت وهدمت دورا.

There is a similar report in al-Maqrizi (1364-1442): "On 20 *Rabi' II*, a violent earthquake in Egypt caused a great deal of damage".

عاودت مصر بالشدة عينها في العشرين من ربيع الآخر كانت زلزلة عظيمة هدمت عدة أماكن.

Al-Suyuti (1445-1505) is even briefer: "In the year [6]62 [H. =1263-1264], Egypt was struck by a violent earthquake".

وفي سنة اثنتين وستين زلزلت مصر زلزلة عظيمة.

^ There are no elements with which to indicate the parameters.

<122> 1265 early August (before 16th) Proconnesus
[north-western Turkey] >landslide<

source Pachym., *Relat. hist.*, 4.16, II, p.377

catalogues d. Evangelatou-Notara (1993); *Papazachos and Papazachou (1997)

In early August 1265, the island of Proconnesus (now Marmara), in the Sea of Marmara, was struck by an earthquake, and a mountain landslide engulfed the village of Galenolimen (present-day Çinarlı or Galimi on the island's west coast).

Information about this earthquake can be found in Pachymeres, a contemporary Byzantine historian who witnessed it himself. Pachymeres was a member of a delegation sent to the patriarch Arsenius, who had been banished to the monastery of St. Nicholas, near Suda on the island of Proconnesus (in the middle of the Sea of Marmara). The delegation had boarded ship to return to Constantinople, and was sailing close to the island when the earthquake occurred (Galenolimen was on the island's west coast):

"In the middle of the night, in fact, a violent earthquake occurred. The mountain split open and crashed down to the sea, engulfing the village, and it gave us the impression that we too were being engulfed, as we were close by the shore".

Νυκτὸς γὰρ μέσης σεισμὸς ἐπεισπίπτει βαρὺς, καὶ τὸ ὄρος, θραυσθὲν καὶ πρὸς εἰς θάλασσαν, τὸν ἐκεῖσε τόπον κατέκλυσε, δόκησίν τε καὶ ἡμᾶς κατακλυσθῆναι παρέσχε, κατ' αἰγιαλὸν μένοντας.

Although Pachymeres does not specify the exact day on which the earthquake occurred, we can establish the chronological sequence of events during the visit to the patriarch Arsenius as follows: the delegation left Constantinople on July 25 and arrived where Arsenius was confined on July 27 (Pachym., II, p.373.16-17). The return journey took place on 16 August (Pachym., II, p.377.7-8). Hence the *terminus post quem* and the *terminus ante quem* for the date of the earthquake. Evangelatou-Notara (1993, p.27) suggests a day between 10 and 12 August.

▲ 1265 08 -

location	lat.	long.	I	location	lat.	long.	I
■ Marmara (island)	40 38	27 37	IX?	Çinarlı	40 37	27 32	EE

< 123 > **1269 April 17 Cilicia [southern Turkey]**

- sources 1 Mxit' Ayriv., *Hist.*, p.68; *Chron. min. Arm.*, I.3, p.83; II.2, p.74; II.25, p.512; Bar Hebr., *Chron.*, p.526; al-Malti, *Ta'rikh*, p.148; al-'Ayni, *Iqd*, II, p.49; Smbat, *Chron.*, p.122; *Est. de Eracles*, II, p.12;
- sources 2 Templ. Tyr, *Chron.*, p.191; Amadi, *Chron.*, ad ann.1269
- historiography Röhricht (1898); Kostaneanc' (1902); Hild and Hellenkemper (1990)
- literature Taher (1979)
- catalogues d. Bonito (1691); von Hoff (1840); Perrey (1850); Mallet (1853); Grumel (1958); Zeyt'unyan (1991)
- catalogues p. al-Hakeem (1988)

On 17 April 1269 there was a destructive earthquake causing widespread collapses and very serious damage in Cilicia, an area of southern Turkey facing the Gulf of Iskenderun and with a vast hinterland. A number of unspecified places were destroyed, but the sources do tell us of the collapse of the fortress of Sarvandik'ar (or Sarbanda, now Savuran Kalesi), the castles of Delnk'ar (or Lambrun, present-day Camliyayla), Hamus (Çardak), Haruniye, Hagar Suglan (Sivlan Kalesi) and the Armenian convent of Ark'akalin (now Peri Kalesi). According to the Venetian chronicle of Amadi, there were collapses at 5 fortresses, 3 abbeys and 12 villages. The total number of victims was 8,000. The earthquake is recorded in contemporary and later Syrian, Armenian, Christian and Arab sources. The most detailed information is to be found in the work of the contemporary Syrian historian Bar Hebraeus (1225-1286), and in the chronicle attributed to the Cilician Armenian historian Smbat Sparapet (Constable Smbat, 1208-1276). Bar Hebraeus records:

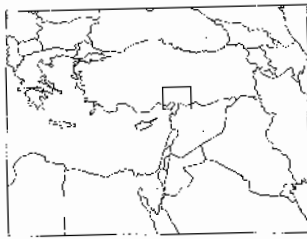
"And in the year fifteen hundred and eighty of the Greeks [1269], on the seventeenth day of the month *Nisan*, at the first hour of the night of the fourth day [of the week], a severe earthquake took place in Cilicia, and it destroyed the rock fortress of Serwand [Sarbanda], and that of 'Amaos [Amus], and that of Haru'ta [Haruniye], and the great Monastery of the Armenians, that is of Balut the king [Ark'akalin]. And about eight thousand souls perished in this catastrophe. [Budge's transl.]

Քի թոմ արևիկա կալի քաղաք քան թոմ քաղաք և. ար. ծոբո
 ոնկո : արտառ ոնկո : սուրբ քաղաք քան ծոբո : քաղաք քա
 լանս քա. քա խոյն, թոմ արևիկա թոմ քաղաք : քաղաք քա
 լանս քա թո թո թո թո թո

In the chronicle attributed to Smbat we read:
 "In the year 718 [13 January 1269 – 12 January 1270], there was a violent earthquake which reduced numerous villages to ruins in various parts of Cilicia, especially at the foot of the Black Mountain [Mt.Amanus]; it destroyed the impregnable fortress of Sarvandik'ar, killing all the inhabitants; in the holy monastery of Arka'akalin the priests and monks died in the ruins of the buildings; and in this mountainous region the earthquake damaged and destroyed numerous villages and, elsewhere, the castle of Delnk'ar". The other Armenian sources for this earthquake consist of a brief mention by the contemporary chronicler Mxit'ar of Ayrivank' and two references in the *Annals of King Het'um* and the *Chronicle of the historian Het'um*. Mxit'ar of Ayrivank' simply recorded a "strong earthquake" in Cilicia. Kostaneanc' (1902, p.10; 21) wrongly dates the earthquake to 1268, probably through misreading Mxit'ar. More problematic, but substantially unfounded, is the dating to the year 1261 by Step'anyan (1964, p.61; cf. Zeyt'unyan 1991, p.91), based on the assumption that Mxit'ar of Ayrivank' has got the date right.

In what is known as the *Annals of King Het'um* (*Chron. min. Arm.* I.3), we read:
 "In 718 [1269-70] Servandik'ar and Hamus were destroyed in an earthquake".

ԶԺԸ փլան ի շարժւ, Սարվանդիքարն և համոսն



1269
April 17

0 30 km

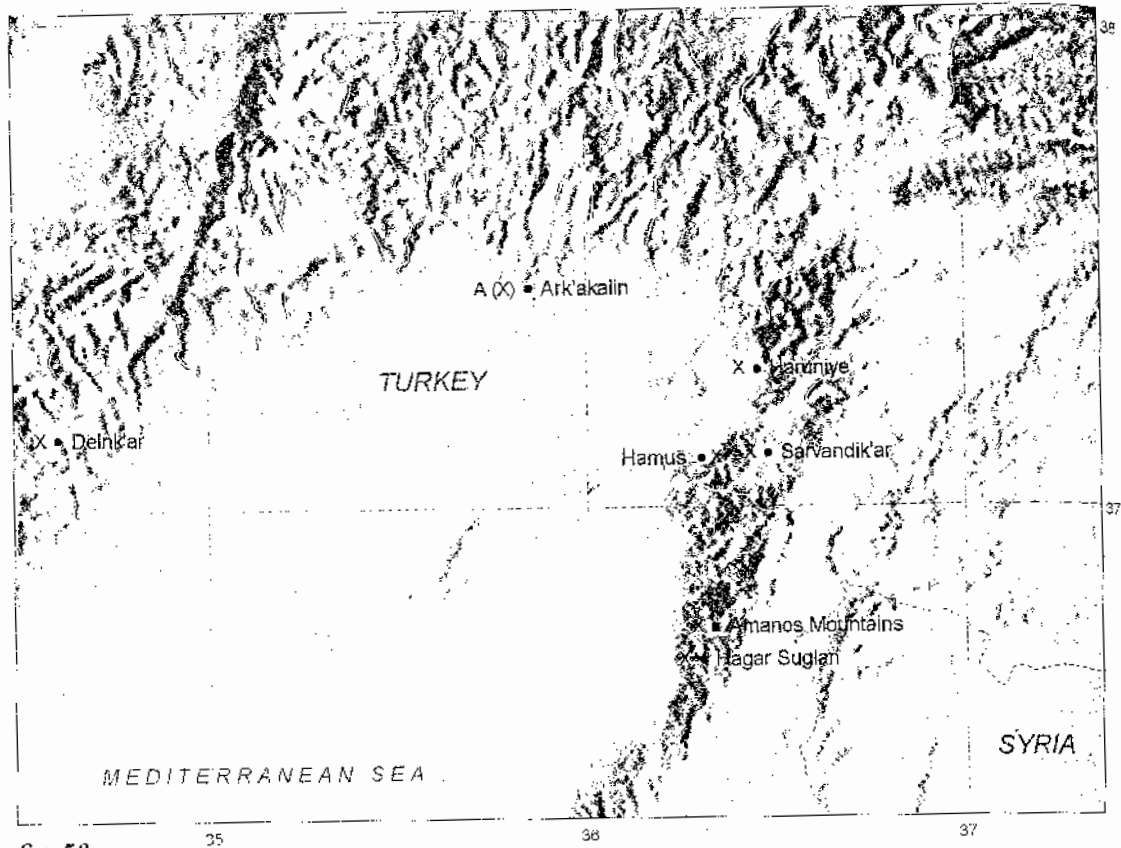


fig. 56

In what is known as the *Chronicle of the historian Het'um*, we find:
"In 1269 Sarvantik'ar, Hamus, Deirnk'ar, and other monasteries and citadels on the Black Mountain [Amanos or Nur Mountains] were destroyed in an earthquake".

ուսկի՞ փլան ի շարժէ Սարվանտիքարն և Համուսն և Դեյրնքան և այլ վանորայք և ամրոցք ի Սև լէռնս.

Christian sources consist of the *Estorie d'Eracles*, a vulgar French translation of William of Tyre with various continuations up to 1277, and the 16th century chronicle by the Venetian author Amadi. The *Estorie d'Eracles* records:

"In the year 1269 there was great destruction in Armenia, with five castles, three abbeys of Armenians and twelve villages razed to the ground. Godfrey of Sargines died on 11 April".

A.M.CC.LXIX. fu un gran crole en Hermenie qui fondi 5 chastiaus et 3 abaies d'Ermins et bien 12 casiaus. Et morut Giefroi de Sargines a 11 jors d'Avril.

The earthquake is also recorded in Arab sources. The 14th century Arab historian al-'Ayni thus tells us that in the year of the Hegira 667 (1268-1269):

"News came that there had been an earthquake in the region of Sis, that its citadels, such as Sarvandikar and Hajar Shaglan [Hagar Suglan], had been destroyed, and that many people had been killed".

منها انه وردت الاخبار بان زلزلة حدثت في بلاد سيس واخرت قلاعها مثل سرفندركار وحجر شغلان وقتلت جماعة.

Also one Arabic source, Abu 'l-Faraj al-Malti, records an earthquake that harmed Cilicia on one unspecified Wednesday in 1269 that could be identified with the Wednesday of the 17 April that other sources refer to. Abu 'l-Faraj al-Malti records:

"It was known that in the year 1580 of the Byzantian era, 1269 of the Christian era, there was a fearful earthquake in Cilicia, at the first hour of the night of one Wednesday the fortresses of Sarunar, Immaws, Al-Hajar al-Asfar, and the convent of Balut al-Malik — the biggest Armenian convent — were destroyed. Around 8.000 persons perished because of this earthquake.

ورد أن في السنة ١٥٨٠ لليونان ١٢٦٩ م حدثت زلزلة هائلة في قيليقية في الساعة الأولى من ليلة الأربعاء وأخربت قلعة سرونر وقلعة عماوس وقلعة الحجر الأصفر ودير بالوط الملك وهو أكبر أديار الأرمن وهلك في تلك الزلزلة زهاء ثمانية آلاف نسمة.

▲ 1269 04 17 17:00 UT ☉ = 37 01 36 21 I₀ = X Me = 6.3 Sites: 7

localities	lat.	long.	I	localities	lat.	long.	I
Camliyayla	37 09	34 36	X	Çardak	37 06	36 18	X
Savuran Kalesi	37 10	36 26	X	Haruniye	37 17	36 27	X
■ Amanos Mauntains	36 45	36 20	X	Peri Kalesi	37 27	35 51	A (IX)
Sivjan Kalesi	36 41	36 18	X				

< 124 > 1269 September Ancona [central Italy] > tsunami, landslide <

- sources 1 *Ann. Ianuen.*, p.124; *Ann. Placent. Gibell.*, p.536; Riccob. Ferr., *Pomar.*, col.138; Pipino, *Chron.*, col.686; Shelomoh ben Mosheh ben Yekutiel, 'Al ha-ra'ashim, in Laras (1973, pp.51-2)
- sources 2 *Cron. Ramp.*, II, pp.173-4; *Cron. Varign.*, II, p.176; BNMarciannaVe, *Mss. Lat.*, Z.402, *Cronaca veneziana*; BAVat, *Barberini Lat.*, 2741, *Quaedam Cronica*
- historiography Leoni (1832); Natalucci (1961); Laras (1973); Busi (1995)
- catalogues d. Bonito (1691); Perrey (1848); Mercalli (1883); Baratta (1901)
- catalogues p. Carrozzo *et al.* (1973); Postpischl (1985); CPTI (1999)

In September 1269 a strong earthquake struck Ancona and Humana (now called Numana) in the present-day Marche region. In both towns many walls collapsed or were damaged, and in Ancona towers and houses suffered similarly. The terrified townspeople fled, and took refuge in tents and shacks. On Mt. Conero (situated between Ancona and Numana, and also called "monte d'Ancona"), a big landslide crashed down into the sea, probably as a result of the earthquake. The waves which it produced reached the Croatian coast of central Dalmatia on the opposite side of the Adriatic.

The most important sources are four Latin chronicles, three of which are contemporary: the *Annales Ianuenses*, an official chronicle of the city of Genoa, compiled for the years 1267-1269 by four authors (Nicola Guercio, Guglielmo di Multedo, Enrico Drogo and Bonvassallo Usodimare); the *Annales Placentini Gibellini*, by an anonymous chronicler from Piacenza who lived in the second half of the 13th century; the *Pomerium Ravennatis Ecclesie* by Riccobaldo da Ferrara, a notary who was born in 1246 and died in 1318. The fourth, slightly later work is the *Chronicon* by Francesco Pipino, who was archivist and sub-prior at the Dominican convent of S. Domenico in Bologna (he was born about 1270 and died in 1328).

There is also a probable reference to the earthquake in a Hebrew expiatory prayer (*selicha*), composed by Shelomoh ben Mosheh ben Yekutiel Mi ha-Adummim [de Rossi]. There is no specific chronological reference to the earthquake in this religious text: the only certain reference point is 1284, the year when the writer died. The only specific geographical reference is the prayer's title: "For the earthquakes which struck Ancona", which suggests a relationship with the 1269 event (Laras 1973, p.48) rather than the 1279 earthquake in Umbria and Marche, as suggested by Busi (1995, p.474).

The earthquake is also recorded in 15th century chronicles, but they do not add to the

information provided by the above sources: the works concerned are the two Bolognese chronicles called *Rampona* and *Varignana* (but they give the date 1268); an anonymous Venetian chronicle in Latin, now in the Biblioteca Nazionale Marciana (Z.402), and another anonymous chronicle in Latin, (surviving in a 16th century copy, but perhaps originating in the early 14th century), now in the Biblioteca Apostolica Vaticana (*Barberini Latini*, 2741). The texts in these last two chronicles are very similar. The *Annales Ianuenses* is the only source which refers to both Ancona and Numana: "Also in that year [1269] in the towns of Ancona and Humana there was a violent earthquake which caused many walls in these towns to collapse and split open from top to bottom".

item in dicto anno in civitate Ancone et Humane terre motus validus fuit, per quem multa menia dictarum civitatum adirruerunt et a summo usque deorsum scissa fuerunt.

The *Annales Placentini Gibellini* provide the most detail about effects in the town of Ancona; and they also make it possible to date the earthquake to September 1269: "At that same time [1269], in the month of September, there was a very great earthquake in the town of Ancona which caused towers and walls and houses to collapse in ruins in an astonishing way, and so great was the fear and dismay of all classes of people in the town, that all of them, great and small, left the town and took to tents and shacks as though they were in the army, and so terrible was the earthquake that none so great could be recalled in human memory".

Eodem tempore de mense Septembris maximus terre motus ortus est in civitate Anchone, ita quod turres et muri et domus illius civitatis cadunt et dirruunt mirabiliter, et timor et tremor valde est in populo et gente illius civitatis, ita quod omnes illius civitatis magni et parvi exiverunt de civitate ad travachas et pavilionos sicut essent in exercitu, et tam terribilis est ille terre motus quod numquam fuit auditus a recordatione hominum citra.

Riccobaldo da Ferrara makes a brief reference to the landslide on the "mountain of Ancona", that is to say Mt. Conero:

"In the year 1269 king Charles successfully besieged Nocera. There were great earthquakes at that time, and the Mount of Ancona [Mt. Conero] split open and crashed down into the sea".

Anno MCCLXIX. Karolus rex Nuceriam obsidione in deditionem recepit. Tunc magni terraemotus et Mons Anconae scisso in mare dissolvit.

The text of Francesco Pipino's *Chronicon* is similar to that of Riccobaldo da Ferrara, but it contains the additional detail that the waves generated by the landslide from Mt. Conero reached the coast of Dalmatia:

"At that time there were great earthquakes and the mountain of Ancona split open and crashed down into the sea; the waves which it produced reached as far as the shores of Liburnia [Dalmatia]".

Tunc maximi terraemotus, et mons Anconae scissus in mare demersus est, quo concursu fluctus usque in litus Liburniae pervenerunt.

Since the Hebrew text written by Shelomoh ben Mosheh ben Yekutiel Mi ha-Adummim [de Rossi] does not contain specific information about the earthquake, being organised in a long series of 53 quotations from the Bible, many of which are from the Psalms, we have not transcribed the text.

▲ 1269 09 - Sites: 2 EE: 1 Ts

localities	lat.	long.	I	localities	lat.	long.	I
Ancona	43 36	13 30	VIII	Mt. Conero	43 33	13 36	EE
Numana	43 31	13 37	VIII	■ Croatian coast	43 45	15 50	Ts

< 125 > **1270 Borgo San Sepolcro [Tuscany, Italy]**

source Tol. Lucca, *Ann.*, p.167; *Hist.*, col.1164

catalogues p. Camassi and Stucchi (1997); CPTI (1999); Castelli (2004)

This earthquake was unknown to the historical tradition of seismic catalogues. It is entered in the catalogue of Camassi and Stucchi (1997) and is therefore included in CPTI (1999: Io = VII-VIII, with just one classified point of intensity). Castelli (2004) presents a summary of the earthquakes of the Casentino-Sansepolcro area: the 1270 earthquake has been entered in an overall table (see tab.5, p.42), with no explicit citing of the sources (but it is very likely that the source is Tolomeo from Lucca, cited in the References, only for the *Annales Lucenses*). The two sources used here, the *Annales Lucenses* and the *Historia Ecclesiastica*, were found during the systematic research carried out for the present catalogue. They are both works by Tolomeo from Lucca, a Dominican friar who was born in 1240 and who died in 1327. On an unspecified day in 1270 an earthquake caused a large number of houses to collapse at Borgo San Sepolcro (now called Sansepolcro) in eastern Tuscany, on the border with the region of Umbria. The townspeople were obliged to take refuge outside the town for a long period.

The text from the *Annales Lucenses* is as follows:

"In the same year [1270] there were earthquakes at Borgo San Sepolcro and many houses collapsed there, with the result that the local people were obliged to live outside the village for a long time".

Eodem anno fuerunt terremotus apud burgum Sancti Sepulcri, rueruntque ibidem multe domus, in tantum quod coacti sunt illi de castro longo tempore morari extra castra.

The text of the *Historia Ecclesiastica*, by the same author, is very similar:

"In the same year [1270] there were great earthquakes at many places in Italy, and they were so great that at Borgo San Sepolcro in Tuscany houses collapsed; everybody was consequently obliged to leave the village".

Eodem anno magni fuerunt terraemotus per diversa loca Italiae, et ita magni fuerunt, quod in burgo Sancti Sepulcri in Tuscia corruerunt domus; unde coacti sunt omnes de villa exire.

The allusion to earthquakes in other Italian towns may be a reference to slightly earlier seismic events, such as the earthquake which struck Ancona a few months before, in September 1269 (see the preceding entry).

▲ 1270 --

localities	lat.	long.	I
Sansepolcro	43 34	12 08	VIII

< 126 > **1270 March Dyrachium [Albania] ▷ tsunami ◁**

sources 1 Pachym., *Relat. hist.*, 5.7, 6.32, II, pp.457, 459, 461, 641; *Acta Albaniae* (pp.88-9, 92, 111, 147-8); panegyric for the Emperor Michael VIII (ed. Previale 1943, p.37)

source 2 *Itiner. Symon. Sem.*, p.38

historiography Poussines (1669); Ducellier (1980, 1981); Failler (1981); Morrisson (1981); Nicol (1984)

catalogues d. Perrey (1850); Mallet (1853); Schmidt (1881); Morelli (1942); Grumel (1958); Sulstarova and Kocias (1975); Evangelatou-Notara (1993); *Papazachos and Papazachou (1997)

catalogues p. Shebalin *et al.* (1974); Papazachos *et al.* (1986)

catalogues Ts Ambrascys (1962); Antonopoulos (1980); Papadopoulos and Chalkis (1984); Soloviev *et al.* (2000)

On an unspecified night in March 1270, a very violent earthquake, struck Dyrrachium (present-day Durrës, Albania), causing the collapse of houses and taller buildings. The part of the city which was shaken is described as "transverse" and the earthquake as being perceived as a "throbbing". Some houses were only partly damaged, but no building was entirely spared; only the acropolis withstood the earthquake. The death toll was increased by the fact that houses in the city were very close together and made it difficult to flee. There was also a tsunami. During the days immediately preceding the shock, loud and frequent noises compared to the lowing of cattle had been heard. The fault which became active is probably very close to the city, since people became aware of violent vertical movement. Immediately after the earthquake, those who lived in the neighbourhood of Dyrrachium entered the city in an attempt to rescue survivors, but their primary aim was to loot the possessions of the victims. The city was abandoned by the survivors for about fifteen years.

There is a long and detailed description of this earthquake in Pachymeres, a contemporary Byzantine historian:

"It was at that time, then, that piteous and heart-rending events occurred at Dyrrachium. In fact, during the month of *kronios* [an archaism for March], unusual noises continually disturbed the ground — noises which in common speech could be described as the lowing of cattle: they clearly foretold that a disaster was about to happen. One day, the noises became louder and more frequent than before. Some people were terrified and left the city in search of a refuge in case something happened. But night fell on these daytime noises, and there was a violent earthquake, more powerful than any other within living memory. It was not, so to speak, an oblique shock of the earth, but rather a shaking in the form of pulsations, with the result that the city suddenly collapsed and was razed to the ground. Houses and tall buildings could not withstand this even for a moment, so they gave way and collapsed, and people remained trapped inside with no means of escape. The buildings were in fact too close together to allow them to escape, and it was much easier to survive by remaining inside houses than by coming out; indeed some houses were partly spared, though none was completely undamaged. They fell on top of one another, and anyone lucky enough to escape the danger of one collapse, was crushed in another. The disaster was too sudden and violent for anyone to escape in flight. It was like a dream for many who died before they realised what was happening. Young and older children had no way of understanding what the disaster was, and they suffocated in the rubble. The sudden noise and din were such that, as they saw the boiling sea recede, survivors thought this was the end of the world rather than just the beginning of their sufferings. Indeed, because the city was on the coast, and since the disaster and the shock came upon them suddenly, people's shouts and the noise of houses collapsing on top of one another made anyone outside the city, their ears shattered by the din, think that this was the end of the world. The earthquake lasted for some time, with the result that nothing could remain standing, for everything inside the city had collapsed, burying people in the destruction, the only exception being the acropolis, which resisted the earthquake and did not give way. When day broke, people who lived in the surrounding area rushed into the city, using hoes and forks and every available tool, and bending low they dug to save those poor wretches who were still alive, but above all in order to pull out of the ruins all kinds of valuables; for since heirs had been buried along with goods belonging to victims, nobody could legally claim such goods. The Albanians and their neighbours, after spending days in this way, digging up everything to be found in the earth and gathering a harvest of gold with their shovels and forks, finally left to its solitude what had once been a city, but could now scarcely be recognised as such, and was numbered amongst existing cities not because it really existed but because it had a name. Its chief priest [the metropolitan] Nicetas, who was there at the time, was spared, but bore the marks of the disaster on many parts of his body. At the sight of the bitter catastrophe,

which no-one would ever have expected, he fled in terror, leaving the city not only deprived of his presence, but of its inhabitants, its beautiful buildings and its wealth".

Τότε τοίνυν μετὰ χαρὸν καὶ τὰ περὶ τὸ Δυρράχιον συνέβη, ἔλεινὰ καὶ πλήρη δακρῶν. Κρονίου γὰρ ἐνστάντος μηνός, ἀσυνήθεις ψόφοι τὴν γῆν ἐτάρασσον συνεχῶς, οὓς δὴ βοασμοὺς κοινολογῶν εἶποι τις, καὶ δήλοι ἦσαν σημαίνοντες ἐπιὸν ἐγγύθεν κακόν· μίᾳ γοῦν ἡμέρας καὶ συνεχέστερον ἐπήχουν οἱ κρότοι καὶ μείζον ἢ πρότερον. Τοῖς μὲν οὖν ἐμπεσοῦσα δειλία ἔξω που κατοικεῖν τοῦ ἄστεος ἔπειθεν, ὡς, εἰ πλέον γένηται, ἀλυξείουσιν. Ἄλλὰ νῦξ ἦν ἐπιγενομένη τοῖς ἡμερινοῖς ἐκείνοις θορύβοις, καὶ σεισμός ἐμπίπτει βαρὺς καὶ τῶν μνημονευομένων μείζων. Ἦν δ' ἐκεῖνος οὐ τρόμος, ὡς ἂν τις εἶποι, γῆς κατὰ τὸ λέχριον κινουμένης, ἀλλὰ κατὰ σφυγμοὺς ἀνατιναγμός, ὡς ἐν ἀκαρεῖ πᾶσαν τὴν πόλιν ἐκείνην ἐκ θεμελίων ἀνατραπῆναι καὶ πεσεῖν εἰς τοῦδαφος. Οἴκοι δ' ἐκεῖνοι καὶ ἀναστάσεις κτισμάτων, μὴδὲ τὸ βραχὺ ἀντισχόντες, ἐνεδίδουσιν καὶ κατέπιπτον, ἐναπολαμβανομένων ἐντὸς τῶν ἀνθρώπων, μηδενὸς ἔχοντος ὅπου φύγοι· τὸ γὰρ τῶν οἰκοδομημάτων συνεχῆς τῇ ἐκείνων φυγῇ προσίστατο, καὶ πολλῶ ἦν ῥᾶον ἐντὸς οἰκιῶν ἢ ἐξιόντας σφύζεσθαι, πλὴν κάκεινων σωθεισῶν ἐκ μέρους· οὐδὲ γὰρ ἦν ἤτις καὶ κατὰ τὸ ἀκέραιον διεγένετο. Ἄλλη γὰρ ἐπ' ἄλλη συνέπιπτε, καὶ ὁ, ταύτης πεσοῦσης, τὸν κίνδυνον ἀποδρᾶς κατὰ τινα τύχην, ἐπιπεσοῦσης ἄλλης, συνελαμβάνετο. Καὶ ἦν ἀθρόον μὲν τὸ δεινόν, δυσχερὲς δὲ ἢ ὥστε τινὰ φυγόντα σφύζεσθαι. Πολλοῖς δὲ καὶ ὄναρ ἐπέστη, οἱ καὶ πρὶν μαθεῖν τὸ συμβᾶν οὐκ ἔφθανον ἀπολλύμενοι· παιδάρια δὲ καὶ βρέφη, μὴδ' ἔχοντ' εἰδέναι τὸ χαλεπόν, τοῖς ἐρειπίοις συγκατεπνίγοντο. Τοσοῦτος δ' ἦν ὁ ἐξαίφνης κτύπος καὶ θόρυβος ὥστε καί, τῆς θαλάσσης ἀναβρασσομένης ἔξωθεν, τοὺς περιγεγονότας ὑπονοεῖν οὐχ ὅπως ἀρχὴν ὠδίνων ἐκεῖνα, ἀλλὰ καὶ αὐτὴν τὴν τοῦ κόσμου ἐπιστῆναι συντέλειαν· τῷ γὰρ παραθαλασσίαν μὲν τὴν πόλιν ἐκείνην εἶναι, δεινὸν δὲ καὶ τιναγμὸν ἐμπεσεῖν ἐξαίφνης, τόσου μὲν θορύβου γεγονότος ἀνθρώπων, τόσου δὲ κτύπου ἐπικαταπιπτόντων ἀλλήλοις τῶν οἰκεμάτων, οἱ ἔξωθεν εὐρεθέντες, μείζονως κατασεισθέντες τὰς ἀκοάς, οὐδὲν εἶχον ὑπονοεῖν ἕτερον ἢ τοῦ κόσμου παντὸς ἐξαφάνισιν. Ἐπ' οὐκ ὀλίγον γοῦν τοῦ σεισμοῦ κρατήσαντος, ὡς μὴδὲν ἐστὸς ἐγκαταλειφθῆναι, ἀλλὰ πᾶν τὸ ἐντὸς καταπεσεῖν καὶ τοὺς ἀνθρώπους συγκαταχῶσαι, παρὰ μόνην αὐτὴν τὴν ἀκρόπολιν – ἐκείνη γὰρ καὶ ἀντέσχε καὶ οὐχ ὑπήκουε τῷ σεισμῷ – ἡμέρας φανείσης, συντρέχουσιν εὐθὺς οἱ περίοικοι, ἅμα μακέλλαις τε καὶ δικέλλαις καὶ παντὶ τῷ προστυχόντι ὄργανῳ πρὸς ὀρυγὴν χρώμενοι, καὶ προσπεσόντες ὄρυττον, ἵνα γοῦν καὶ τισὶ ταλαιπώροις ἔτι ζῶσιν ἀπαμύναιεν τοῦ κινδύνου, τὸ δὲ πλέον ὡς ἂν καὶ πλοῦτον παντοδαπὸν ἐκφορήσαντες, τοῖς ἐρειπίοις κατασπασθέντα, λαβόντες ἔχοιεν· τότε γὰρ τοῖς πράγμασι τῶν πεσόντων καὶ οἱ κληρονόμοι συγκατεδύοντο, καὶ ὁ λαγχάνειν τὰς ἐξούλης δίκας ἐκείνοις οὐκ ἦν. Ἐφ' ἡμέραις οὖν ἅπαν τὸ γεγονὸς εἰς ἔδαφος κατασκάψαντες καὶ χρυσοῦν ἀμήσαντες θέρος, Ἀλβανίται τε καὶ οἱ περίοικοι, ὡς ἅμα χρώμενοι ταῖς δικέλλαις, τέλος ἔρημον ἀφίασι τὴν ποτε πόλιν ἐκείνην, γωριζομένην σημείοις τισὶν ἀμυδροῖς, ἐν οὓσι καταλεγομένην οὐ τῷ εἶναι, ἀλλὰ μόνῳ τῷ ὀνομάζεσθαι. Ὁ δ' ἐκείνης ἀρχιερεὺς Νικήτας, εὐρεθεὶς κάκεινος τῷ τότε καὶ φυλαχθεὶς μὲν, ἀλλ' ἐν πολλοῖς τῶν μελῶν τὰ σύμβολα τοῦ κινδύνου φέρων, πικρὰν ἰδὼν συμφορὰν καὶ ἦν ἤκιστ' ἂν τις καὶ προσεδόκησε πῶποτε, κατάφοβος φεύγει, ἀφείς ἔρημον οὐχ ἑαυτοῦ μόνου, ἀλλὰ καὶ τῶν ταύτης ἐποίκων καὶ κάλλους κτισμάτων καὶ πραγμάτων αὐτῶν τὴν μητρόπολιν.

One passage in Pachymeres' description is important from a legal point of view. Goods buried under the rubble seem in this case to have been considered "treasure trove" and were therefore subject to laws which allowed the finder to take half, leaving the other half to the owner. On the other hand, there are early 14th century non-legal texts which attack the appropriation of treasure by the emperors, suggesting that such action was a crime equivalent to tomb violation (Morrisson 1981, pp.339ff.). Reference is made to the state of total abandonment and destruction at Dyrrachium after this earthquake in a panegyric for the Emperor Michael VIII (Previale 1943, p.37) and,

more particularly, in certain documents from the Angevin archives. Set out below are two documents which refer explicitly to the earthquake. In a deed of 18 December 1273 (*Acta Albaniae*, pp.88-9, no.305), there is mention of inhabitants of Dyrrachium who had fled

"[...] for fear of earthquakes, which frequently shake the city [...] Corato [...] 18 December in the second indiction [1 September 1273 – 31 August 1274]".

[...] timore terremotus, quo civitas ipsa frequenter hactenus quassabatur [...] Datum Caurati [...] XVIII decembris II indictionis".

Fourteen years later, on 14 October 1284 (*Acta Albaniae*, pp.147-8, no.492), Charles I of Anjou (1266-1285) tried to encourage those who wanted to return to the city by ordering that property taken illegally should be restored to its rightful owners:

"[1284] 14 October. Brindisi. Charles I, king of Dyrrachium, orders that those citizens of Dyrrachium who left the city at the time of the earthquake, be allowed to return.

On behalf of the citizens of Dyrrachium.

To Guglielmo Bernardi, captain of Dyrrachium and Albania etc. A humble petition has been presented to us on behalf of all the inhabitants of Dyrrachium, our faithful subjects, pointing out that many of their fellow citizens left the area at the time of the earthquake which caused the destruction and ruin of the city, and transferred their residence to other regions, and that they now wish to return with their wives and servants to their own property. By our royal authority we therefore order that property taken by outsiders and other illegitimate owners be returned to them. [...] Brindisi 14 October in the thirteenth indiction [1 September 1284 – 31 August 1285]".

[1284] 14 octobris. Brundusii. Carolus I rex Dyrrachii mandat, ut cives Dyrrachii, qui tempore terraemotus emigraverant, recipiat. Pro hominibus Durachii.

Scriptum est Guillelmo Bernardi capitaneo Durachii et Albanie etc. Pro parte universitatis hominum Durachii nostrorum fidelium fuit nobis humiliter supplicatum, quod, cum nonnulli eorum concives ab olim tempore terremotus, ex quo dicta civitas diruta exstitit et destructa, de predicta terra discesserit et ad partes alias eorum transtulerint incolatum, ac nunc redire velint ad propria cum uxoribus et familiis eorundem, restitui eis possessiones isporum, que ab extraneis gentibus et aliis non veris dominis delinentur, de bannitate regia mandamus. [...] Datum Brundisii die XIII octobris XIII indictionis.

The *Itinerarium Symonis Semeonis* is an account of a journey to Jerusalem undertaken in the spring of 1323 by two friars from Ireland, in which the terrible disaster which had destroyed the city of Dyrrachium is recorded and the death toll given as 24,000. In August 1323, more than half a century after the earthquake, the two friars reached Dyrrachium by ship from Pola in Istria:

"[...] and thence by sea to Dyrrachium, a city once famous and powerful both on land and sea, a possession of the emperor of the Greeks. [...] This city is in the circuit of its walls very extensive, but in buildings miserably small, because it was once totally destroyed by an earthquake, during which the wealthy citizens and inhabitants, to the number of 24,000, so we are told, were buried beneath their own palaces and killed. It is now thinly populated by people of different religions, customs and languages: by Latins, Greeks, perfidious Jews, and barbarous Albanians".

[...] et navigavimus Durachiam, civitatem olim famosam et in mari et in terra potentem, et imperatori Grecorum subjectam [...]. Ipsa autem civitas est in murorum ambitu amplissima et in edificiis vilis et exigua, quia quondam terre motu fuerat funditus eversa, et in ejus eversione ditissimi ejus cives et inhabitatores propriis palatiis oppressi fuerant, ut dicitur, bene xxxiii milia, et mortui sunt. Nunc autem in populo est sterilis, qui et est ritu, habitu et lingua divisus. Inhabitatur enim Latinis, Grecis, Judeis perfidis, et barbaris Albanensibus.

Historical studies are imprecise and inconsistent in dating this earthquake. It is traditionally placed in March 1273 (P. Poussines, who edited the 17th century edition of Pachymeres in 1669), and seismic catalogues follow this dating. In Morelli (1942, p.10), the date is given as March 1237, perhaps as a result of a printing error. Ducellier (1980, p.108) first thought the earthquake was "datable to 1269", but later mistakenly identified *kronios* as July-August and so back-dated it to "July-August 1266 or 1267" (Ducellier, 1981, p.177, 219, note 129). The correct date has been established by Failler (1981, pp.214-8) as March 1270. However, some quite recent studies have failed to note his observations, and continue to offer incorrect dates: Nicol (1984, p.15) has proposed March 1271, while Evangelatou-Notara (1993, p.27) dates it to "March 1270", but in such a way as to express doubt.

▲ 1270 03 -

localities	lat.	long.	I
Durrës	41 18	19 28	IX-X Ts

< 127 > 1273 Potenza [southern Italy]

- sources Charles I of Anjou (king), *Letter*, 18 December 1273 (in Bonito 1691, pp.523-4; also in Filangieri 1958, doc.151, pp.56-7)
- historiography Zerenghi (1626); Giustiniani (1804); Viggiano (1805); Moroni (1840-79); Zuccagni Orlandini (1845); Lenormant (1883); Magliano (1895); Pedio (1968)
- catalogues d. Bonito (1691); Capocci (1861-63); Mercalli (1883); Baratta (1901); Milne (1911); *Boschi *et al.* (1995, 1997, 2000)
- catalogues p. Giorgetti and Iaccarino (1971); Carrozzo *et al.* (1973); Postpischl (1985); CPTI (1999)

Evidence for this earthquake is to be found in a single archive source: an Angevin Chancery document, formerly preserved in the Archives of the Naples Mint. The Angevin archive was destroyed in a fire on 30 September 1943, during the Second World War. The document concerned is a letter, dated 18 December 1273, from Charles I, king of Naples, to his representative (justiciar) in Basilicata. In this letter the king orders the gathering of detailed information about damage caused by an earthquake which had struck the city of Potenza a little earlier.

On the basis of this source it may be conjectured that the earthquake caused serious damage at Potenza, and unquantified damage in the Basilicata region. In the particular case of Potenza itself, most buildings were damaged, as well as furnishings in dwellings and churches. Many people abandoned the city. For lack of sufficient resources, most inhabitants were unable to undertake rebuilding or pay their taxes, and they sought temporary tax exemption from Charles of Anjou. Potenza and the surrounding area were going through a particularly difficult period from a social and economic point of view, for very few years before the earthquake, the city had fought a war with Charles of Anjou, after which the city walls had been knocked down. The text of the document is given here in the transcription provided by Bonito (1691, pp.523-4), which is fuller than that found in Filangieri's edition (1958, document no.151, pp.56-7): "A letter to the justiciar of Basilicata, etc. A petition has been made to us as Lord by our loyal people of Potenza to the effect that the city has been devastated in its buildings and all their furnishings by an earthquake which raged there terribly in recent days, and so the men of this city are equally devastated because they are completely unable to maintain themselves, to rebuild their houses, repair their furnishings and cope with the burden of taxation, for many people have abandoned the city and continue to do so, [and so a petition has been made] asking our majesty to deign to grant them immunity for a fixed period, so that by means of such immunity men will be encouraged

to return to the city and reside there and restore it to its previous state. In this regard, therefore, we wish to take steps both to avoid harming our curia and to provide succour to the petitioners, and so, trusting in your loyalty, we order you to go in person to the city in question, to examine carefully and ascertain diligently what wealth these people had before the earthquake, in what way and to what extent they have been harmed, and to what they have been reduced by so powerful an earthquake; whether they are able to sustain contingent taxation without difficulty, and to what extent; or, if you think that for the time being they cannot contribute any taxes, for how long they need immunity both for their own succour and to maintain the curia; and when you have established this, be sure to provide us with a faithful, clear and precise report in your letters, and take care not to be negligent in carrying out these duties and not to report to our court things that are not true. Issued at Corato, on 18 December of the second indiction”.

Scriptum est Iustitiario Basilicatae, et cetera Ex parte universorum hominum Potentiae nostrorum fidelium fuit nostro Culmini supplicatum, quod cum ex Terraemotu, qui terribiliter ibi diebus istis invaluit, terra ipsa fit in edificiis, et suppellectilibus fere omnibus devastata, sicque homines terrae ipsius taliter desolati considerantes se ad sustentandam vitam, reficiendas domos, restauranda suppellectilia, et subeundam Collectarum onera penitus impotentes, quod magna pars hominum de terra ipsa discesserint, et discedant, providere illis de immunitate alicujus certi temporis nostra serenitas dignaretur, ut ad redeundum ad terram ipsam, et morandum ibidem, atque reformandam terram ipsam per immunitatem hujusmodi animentur. Nos igitur super hoc tam indemnitati nostrae Curiae, quam relevationi supplicantium eorundem providere volentes, fidelitati tuae praecipiendo mandamus quatenus ad terram ipsam te personaliter conferens, studiose videas, et diligenter inquiras, in quibus eorum facultates ante Terraemotum ipsum constiterint, quantum, et in quibus damnificati, et ad quas facultates reductae sint, ex hujusmodi Terraemotu; si quid etiam, et quantum in Collectis contingentibus commode ferre possint, aut si nihil ad praesens eos conferre posse videris, quanti temporis immunitas eis tam pro eorum relevatione quam pro Curiae indemnitate sufficiat, et quid inde inveneris nobis fideliter, et distincte per tuas litteras insinuare procures, cautus ne in exequendis iis omnibus te negligentem exhibeas, aut aliter quam fuerit, Curiae nostrae scribas. Datum Caurati, 18 Decembris secundae Indictionis.

Unfortunately, the report made by Charles I's justiciar as to the effective damage caused by the earthquake and any intervention by the public authority in aid of the stricken communities has not survived. 19th century historiographical and seismological works (Viggiano 1805; Zuccagni Orlandini 1845; Capocci 1861-63; Lenormant 1883) make use of Bonito's reference to the earthquake, but do not add anything fresh of importance. Viggiano (1805) corrected those earlier historians who gave the date of the founding of the city of Potenza as after the earthquake, pointing out that there were many pre-13th century monuments to be seen in the city, and reassessing the extent of the earthquake. A local historian, Baron Magliano (1895), mentions Leo of Ostia's chronicle as a source for this earthquake, and derives from it the suggestion that houses collapsed and 4,000 people were killed; but we cannot take this into consideration, because the work referred to by Magliano goes back to the early 12th century, and its author died about 170 years before our earthquake. Magliano is confusing this earthquake of 1273 with another which occurred in the Montecassino area in 1120 and is indeed mentioned in Leo's chronicle (see above for that earthquake).

The dating of the earthquake to 1273 is the result of a suggestion by Bonito (1691). The relevant document from the Angevin Chancery, to be found in the register of documents for the year 1274, uses the indiction cycle system, and is dated to 18 December of the second indiction. Bonito (1691) held that this Chancery used the Greek or Constantinopolitan indiction system, which began the numbering of cycles from 1 September, so that 18 December of the second indiction fell in the year 1273. The fact

that the document was put into the register for 1274 was the result of a later reorganisation of the documents in the archive, in the early 16th century.

▲ 1273 --

localities	lat.	long.	I
Potenza	40 38	15 48	VIII-IX

(128) 1275 October 3 Arces [eastern Turkey]

- sources 1 Mxit' Ayriv., *Hist.*, p.68; *Chron. min. Arm.*, II.4, p.146; Bar Hebr., *Chron.*, p.532; al-'Ayni, *Iqd*, II, p.150
- inscription DHV I. 76 (Orbeli 1966, p.24)
- source 2 Sam. An. Cont., p.162
- literature Abich (1882); Taher (1979)
- catalogues d. von Hoff (1840); Perrey (1850); Maillet (1853); Grumel (1958); Step'anyan (1964); Zeyt'unyan (1991)
- catalogues p. Ergin *et al.* (1967); Poirior and Taher (1980)

On 3 October 1275, a destructive earthquake affected a large area of historic Armenia (now part of eastern Turkey), causing the almost total destruction of Xlat' (now Ahlat) and Arces (Ercis). There were many victims. There was serious damage at Mayafariqin (Silvan) and Mardin, and probably at Diyarbakir as well. The earthquake was strongly felt at Ani, where it may have caused slight damage. Ani was Armenia's chief city at that time, and its ruins are near the present-day Turkish town of Okakli. The earthquake is recorded in Armenian, Syrian and Arab sources. The contemporary Armenian historian Mxit'ar of Ayrivank' states briefly that in 1276:

"An earthquake occurred in Xlat' and all its territory".

Շարժ եկն ՚ի Խլաթ և յամենայն սահմանս նորա.

The contemporary *Annals of the Anonymous of Sivas* (Hakobyan 1956, *Chron. min. Arm.* II.4, vers. B) provide some additional information in a context relating to the year 725 [1275-6]:

"In that same year the earthquake destroyed Xlat' and Arces".

Ի սոյն ամի կործանեաց շարժն զԽլաթ և Արճէշ.

The continuation of the chronicle of Samuel of Ani provides a different date, however, for it places the earthquake in the year 1282. There is evidence that the earthquake was felt at Ani in an inscription:

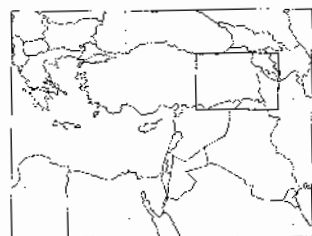
■ in the church of the Holy Apostles (Arak'elk'). In one of the niches in the *gavit'* on the south side of this church, was the following inscription:

"For the ellan [the-xan]. Thanks be to God, under the government of this city, and under the primacy of *ser* Sarkis, and under the *melik'* Faxratin [Fahr-el-din], I, Bishop Mxit'ar of Teler, have cancelled the Sunday market on this road because of the recent earthquake. Those who oppose this enactment, whether great or small, bear the sins of this city".

Էլղ-/ անին/ Շնորհիւն Ա(ստուծոյ) ի տերութե(ան) քաղ-/ արքս եւ յառաջնորդութե(ան) տ(է)ր/ Սարկսի եւ ի ի մելիքութեան/ Փախրադինին եւ Միթար եպիսկ(ոպոս)/ Տելերէցի ի ցամամնէ շարժ-/ ի աւուրքս բարձար զկիրա]-/ կէի վաճառն ի փողոցէ Ուր/ այս գրիս հակառակ կայ թէլ/ մեծ թէ փոքր քաղաքիս մեկ-/ զլացն տ(է)ր է.

There is detailed information about the earthquake's effects in the chronicle of the contemporary historian Bar Hebraeus:

"And when the year fifteen hundred and eighty-seven (of the Greeks, 1275) began, on



1275
October 3

0 120 km

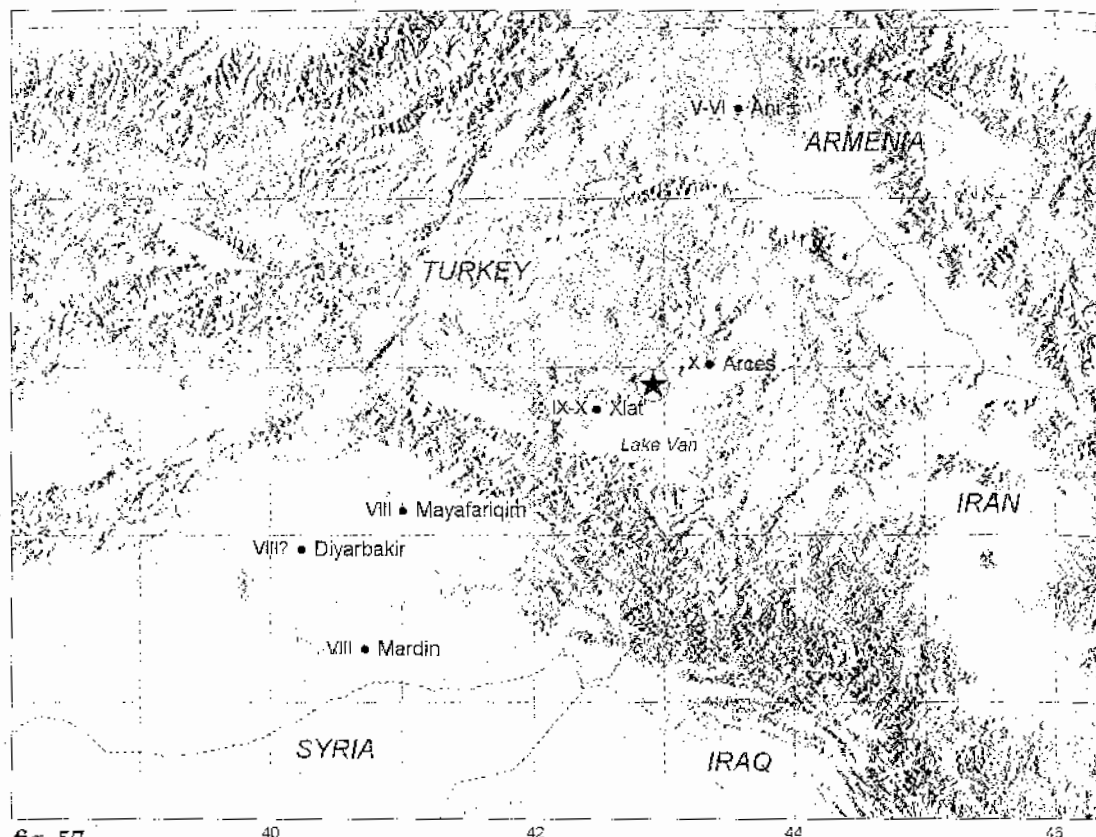


fig. 57

the fifth day [of the week], on the third day of the month of *Tishrin I* (October), a violent earthquake took place in the city of Arkestia, which is Argis [Arces], and its strong walls and all its buildings collapsed, and a large number of its inhabitants perished. And the same thing happened in the city of Khalat [Xlat], and the earthquake in its territory took place at the ninth hour; there was great destruction there, but it was not as widespread as at Argis". [Budge's transl.]

هذه السنة كان بخلاط زلزلة عظيمة اخرجت الدور والحانات والأسواق ومات الناس
 تحت الردم ولم ينج من أهلها إلا النفر القليل واتصلت بأرجيس فأخربتها وخسفت
 فيها مواضع ووصلت إلى ديار بكر فشعبت ميافارقين وماردين.

Further information can be found in the chronicle of the 14th century Arab historian al-Ayni:
 "In that year [673 H.], a violent earthquake occurred in Khalat [Xlat], destroying houses, workshops and markets; there were many victims in the ruins, and only a few people survived. The seismic activity moved to Arjis [Arces], where it caused destruction and ruin. Later it reached Diyarbakir, causing damage at Mayafarqin and Mardin on its way".

وفي هذه السنة كان بخلاط زلزلة عظيمة أخرجت الدور والحانات والأسواق ومات الناس تحت الردم ولم ينج من أهلها إلا النفر القليل واتصلت بأرجيس فأخربتها وخسفت فيها مواضع ووصلت إلى ديار بكر فشعبت ميافارقين وماردين.

Abich (1882, p.438, quoted by Step'anyan 1964, p.60) replaced the date 1246, which would seem to coincide with what Noah the Jacobite suggests, with the year 1245-1246. Step'anyan (1964, p.61) follows the dating proposed by a continuation of Samuel of Ani; Zeyt'unyan (1991, p.91ff.) seems to place the inscription within the context of 1265.

▲ 1275 10 03 ☉ = 38 53 42 55 I₀ = IX Me = 6.0 Sites: 6

localities	lat.	long.	I	localities	lat.	long.	I
Ercis	39 01	43 21	X	Mardin	37 19	40 43	VIII
Ahlat	38 45	42 29	IX-X	Silvan	38 09	41 00	VIII
Diyarbakir	37 55	40 14	VIII?	Ani	40 32	43 34	V-VI

< 129 > 1275 before Ischia island [southern Italy]
 > subsidence of a stretch of coastline? <

source Charles I of Anjou, Order, 2 Novembre 1275 (in Cubellis 1996, pp.128-9)
 historiography Buchner Niola (1965); Buchner (1986)

This earthquake is unknown to the Italian seismic catalogue tradition. On an unspecified day in 1275, the island of Ischia was struck by an earthquake: some houses were destroyed and there were many victims, though the exact number is not known. A stretch of the coast may have collapsed into the sea, and a good deal of agricultural property was totally lost.

The source is a document, now lost, from the Angevin records in the State Archives in Naples. The text was transcribed by Eduard Sthamer (1883-1938) before the fire of 30 September 1943, during the Second World War, which destroyed the Angevin archive. It was first published in Buchner (1986, p.180) and now in Cubellis (1996, pp.128-9).

The document shows that on 2 November 1275, king Charles I of Anjou gave orders for an investigatory committee to be sent to the island, following a petition from its inhabitants asking for exemption from the payment of taxes because of earthquake damage. The document is of special interest because of the light it throws on a particular administrative procedure which demonstrates the complex arrangements governing tax exemptions after a strong earthquake. The text of the document is as follows:

"To Charles of Naples and the notary Giovanni de Barolo.

From the men of Ischia. [...] A petition sent to our Excellency contained a request that, since not long ago because of the disaster of the earthquake many of these men were killed, for part of the said place sank into the sea, and many agricultural properties were completely lost, and some houses were destroyed, since they can no longer enjoy the fruits and income on which their subsistence largely relied, therefore the others [those who did not suffer losses] are not able to make payment of the general tax imposed on their land, and to fulfil other [tax requirements] which are charged to them by our *curia*, and so we have deigned to make provision about this with royal graciousness. We are therefore disposed to accept these petitions in the name of your loyalty [...] we send you as a collective body to the island of Ischia to ascertain whether the earthquake was as reported, at what time and in what part of the island it occurred, and what damage it caused. Investigate and report to us in writing. Given in Naples on 2 November, in the third indiction (1275)".

Carmayno de Neapoli et notario Iohanni de Barolo

Ex parte hominum Yscele [...] porrecta excellencie nostre peticio continebat, quod, cum nuper ex quodam infortunio terremotus nonnulli ipsorum hominum, parte dicte terre in mari submersa, perierint et possessiones multe omnino perditae et aliquae edes sint destructae, quod nulli possunt proventus seu redditus, quibus pro magne parte sustentabantur actenus, provenire propter quod nequeunt alii remanentes impositam eidem terre generalem collectam exolvere et alia, que pro parte curie nostre eis imponuntur, implere, ut super hoc providere de benignitate regia dignaremur. Nos igitur ipsorum supplicationibus inclinati, fidelitate vestre [...] mandamus, quatinus ad terram Yscele vos

personaliter conferentes, si terremotus ipse fuit, ut ponitur, quando et in qua parte ipsius terre, quodque dampnum evenit propterea, [...] inquiratis, quicquid inveneritis [...] nostre curie rescripturi. Datum Neapoli, II. novembris IIII. indictione [1275].

▲ 1275 before

localities	lat.	long.	I
■ Ischia (island)	40 44	13 57	VIII-IX EE

< 130 > **1276 May 22-25 Orvieto [central Italy] > landslides <**

sources 1 *Chron. S.Petri Erf. mod.*, p.277; *Ann. Urbev. Cron. ant.*, p.133; *Ann. Urbev. Cron. potest.*, pp.158-9
sources 2 *Cron. Reinhard.*, p.629; Manenti, *Cron.*, p.315
literature SGA [2001]
catalogues p. Dell'Olio and Molin [1980]; Postpischl (1985)

This earthquake does not appear in current seismic catalogues.

This seismic sequence began on 22 May 1276 and continued for four days, causing collapses and structural damage to buildings in the city of Orvieto and its territory (now in the province of Terni), and especially at Rocca Ripeseana. There is no trace of this destructive event in the Italian catalogues in use, though an earthquake dated simply to 1276 does appear in the catalogue of Dell'Olio and Molin [1980] and in that of Postpischl (1985, microfiches). The event appears in these catalogues not only with a very generic dating, but also without an epicentral intensity: that is why it was not included in the *Catalogo dei Forti Terremoti in Italia* (Boschi *et al.* 1995, 1997, 2000), where the epicentral intensity threshold is grade VII-VIII. It is likely, moreover, that the event was not considered even by the compilers of the Camassi and Stucchi (1997) catalogue. That is why it does not appear in the CPTI (1999) Italian parametric catalogue.

In the course of research into earthquakes unknown to current Italian catalogues (SGA 2001), some primary sources for the 1276 earthquake have been discovered.

Between 22 and 25 May there were numerous violent shocks which caused serious damage: houses and some towers collapsed, while other buildings were damaged and torn apart. Out in the fields, trees were torn up by the roots, perhaps as a result of landslides, and crops were lost. There may have been a high death toll as well. The townspeople fled in terror and camped out in the open. Communal rites of penitence were organised. At Rocca Ripeseana, a village not far from Orvieto, the banks (*ripe*) collapsed. This term must refer to the "walls" which supported the narrow and very steep lanes used by the watch.

The most detailed source is the *Chronica S.Petri Erfordensis moderna*, a chronicle compiled at the Benedictine monastery of St.Peter at Erfurt in Germany. The monks who compiled the chronicle very probably obtained information about the earthquake from brethren who had actually experienced it.

The text is as follows:

"In the year of Our Lord 1276. [...] In that year at Orvieto and in the surrounding area there was a great earthquake which began on the Friday before Pentecost and lasted for four days, during which time every day and night the earthquake was so violent that some towers fell to the ground, houses collapsed, cornerstones came away from their joints and the joints closed up again, and trees in the fields were torn up by the roots. Men and women, old and young, took off their clothes and beat themselves with whips. They fled from the town and gathered in the fields, for they were afraid to go back. No-one was left in the town but monks, who went into churches and earnestly prayed to God on behalf of the people. Crops and vineyards were lost".

Eodem anno [1276] apud Urbem-veterem et in terminis illic terre motus factus est magnus, qui incepit in die Veneris ante festum penthecosten et duravit per IIII dies, quibus singulis diebus et noctibus factus est terremotus, ita quod turre alique ceciderunt, domus corruerunt, lapides angulares de suis iuncturis exilierunt, et iterum clause sunt iuncture, arbores in campis evulse sunt e radicitus; viri et mulieres, senes et iuvenes vestibus exuti flagellis se ceciderunt, de civitate fugierunt nec ausi fuerunt redire et in campis se receperunt; nulli in civitate remanserunt nisi soli religiosi, qui ecclesias intraverunt et Deum pro populo devotissime oraverunt. Segetes et vinea perierunt.

22 May was indeed a Friday in 1276: two days before the feast of Pentecost.

Two other sources which confirm the above report are contemporary annals from Orvieto with briefer accounts than the German source. Of these, the *Cronica potestatum* from the *Annales Urbevetani*, however, allows us to add the village of Rocca Ripesena to the localities struck by the earthquake:

"1276. [...] In that same year, on 22 May, there was a very great earthquake: and the *ripe* collapsed in some places, particularly in the *Surripe contrada* and at Rocca Ripesena".

M.CCLXXVI. [...] Eodem anno, die XXIJ madii, fuit terremotus maximus: et ceciderunt ripe in pluribus locis, maxime in contrata Surripe et Rocca Ripiseni.

The *contrada* of *Surripe* was probably part of a district in Orvieto. The *Cronica antiqua* in the *Annales Urbevetani* is briefer and provides no further information:

"1276. - [...] In that same year there were great earthquakes at Orvieto, on the tenth day before the end of the month of May [22 May]".

1276. - [...] Eodem anno fuerunt magni terre motus in Urbeveteri, 10 die exeunte mense maii.

Luca di Domenico Manenti, an Orvieto chronicler who lived in the late 14th and early 15th century, makes what is almost certainly a reference to this earthquake, though he records it at the year 1277 and gives no indication of the day or month. The author's chronological unreliability is confirmed by the entry following that of the earthquake, where he refers to a visit to Orvieto by pope Innocent V, who in fact died in Rome on 22 June 1276.

The text is as follows:

"1277. [...]"

In that year there was a very great earthquake at Orvieto: houses and *ripe* collapsed and many people were killed, and the Soliano gate collapsed, accompanied by serious damage to the *ripe*; and S.Maria Prisca, near the bishop's palace, was also seriously damaged".

MCCLXXVII. [...] Detto anno fu uno grandissimo terramoto in Orvieto, chè cascaro le case et ripe intorno, con la occisione de molti genti, et cascò la porta del Soliano con grande rovina de ripa; et così Santa Maria Prisca se divide in grande rovina, apresso il vescovato.

The church of S.Maria Prisca no longer exists. It was demolished in 1290 on the orders of pope Nicholas IV in order to build Orvieto cathedral on the site.

The Soliana gate is now called Rocca gate. It acquired that name in the second half of the 14th century, after Albornoz's fortress was built..

▲ 1276 05 22-25 cumulative effects

localities	lat.	long.	I	localities	lat.	long.	I
Orvieto	42 43	12 07	VIII-IX	Rocca Ripesena	42 43	12 04	VIII

< 131 > 1278 February 25 shortly before Corfu [Greece]

sources Charles I of Anjou (king), Letters (two), 25 February 1278 (in Mazzoleni ed. 1964, docs. nos.837-838, pp.409-10)

This earthquake is unknown both to seismic catalogues and to historiographical literature.

Shortly before 25 February 1278, an earthquake struck the town of Corfu (Kérkyra) on the island of same name. Corfu is the most northerly of the Ionian Islands, opposite the coast of Epirus. The earthquake caused part of the town walls to collapse, and perhaps also part of the town hall, which stood inside the fortified settlement.

The sources are two letters from king Charles I of Anjou, dated 25 February 1278 and sent respectively to the justiciar of the Terra di Bari (an area corresponding to present-day central Apulia) and the vice-justiciar of the Terra d'Otranto (an area corresponding to the present-day Salentine peninsula and the province of Taranto). The original documents were once in the Angevin Chancery, which subsequently became part of the Archivio di Stato of Naples; but after parts had been destroyed at various times over the centuries, the remainder was irretrievably lost in the fire which destroyed the Angevin archives on 30 September 1943. However, the *Ufficio della Ricostruzione Angioina* (Office for Angevin Reconstruction) was set up as early as 1944, its remit being to track down transcriptions, summaries and reports of Angevin documents in bibliographical sources and Italian and foreign public archives.

The first document (in Mazzoleni ed. 1964, doc. no.837, pp.409-10) tells us that the Captain of the island of Corfu, which was under Angevin control at that time, had requested the despatch of labour for reconstruction work following an earthquake, which had presumably occurred shortly before. Set out below are the relevant passages: "On behalf of the two messengers, master builders.

[...] Giordano di San Felice, Captain of our island of Corfu, a soldier and our faithful (servant), has informed us in a letter that we should make a decision with great speed and promptitude because it is not possible to find sufficient master builders on the island to completely rebuild the *palazzo* in the island's castle and to restore part of the walls of the city of the island which have been badly damaged in an earthquake. Since we are utterly determined that the speedy reconstruction of those walls should not involve any defects, shoddiness or delays [...] for the whole operation risks being harmed or inconvenienced if anything should now happen to cause delays or shoddy or defective workmanship, we have therefore decided that without further delay you shall find two good master builders and employ them at a fair and suitable wage, and that they shall be taken without further delay to the Captain and employed on the said work.

[There follows a description of the rates and methods of payment to be applied to these master builders.]

Given at the Torre di Sant'Erasmo, near Capua [Santa Maria Capua Vetere] on 25 February (in the sixth indiction) [1278] (Reg.31, fol.32)".

Pro mictendis duobus magistris fabricatoribus.

[...] *Significavit Excellentie nostre Iordanus de Sancto Felice Capitaneus insule nostre Curfoj miles et fidelis noster per licteras suas quod in insula ipsa pro constructione cuiusdam palacii faciendi de novo in castro eiusdem insule et pro refectione cuiusdam partis muri civitatis ipsius insule ex tremotibus diruti, quem cum omni celeritate et sollicitudine instantissime [...] iuximus magistri fabricatores sufficientes nequeunt inveniri. Cumque nolumus in celeri refectione ipsius muri aliquem prorsus intervenire defectum seu negligentiam vel tarditatem commicti, [...] sub pena totius dampni incommodi et interesse, siquid ob moram, negligentiam aut defectum executioni presencium serviciis nostris eveniret. [...] precipimus quatenus [...] sine qualibet tarditate duos bonos mag. fabricatores invenias et sub iusta et competenti mercede*

conducas, ipsosque conductos ad pred. Capitaneum sine mora transmittas in dicto opere moraturos. [...] Datum apud Turrin Sancti Erasmi prope Capuam, die XXV februarii (VI indictione). (Reg.31, f.32).

The second document (in Mazzoleni ed. 1964, doc. no.838, p.410), echoes the previous text, but has some gaps.

“For repairs to the walls on the island of Corfu.

A letter was received by Eliseo di Laduno, *vicegiustiziere* of the Terra d’Otranto. To our Excellency [...] a soldier and our faithful (servant) [...] informed us in a letter (that we should come to a rapid decision) that since on that island for the complete rebuilding of the *palazzo* and the reconstruction of the city walls on the island which have been badly damaged in an earthquake [...] since it is not possible to find [...] Given at the Torre di Sant’Erasmo, near Capua [Santa Maria Capua Vetere], by master Guglielmo di Farumvilla, in the year of Our Lord 1278, in the month of February, on 25 of that month, in the sixth indiction (Reg.31, fol.97 t.)”.

Pro reparatione murorum insule Corfoy.

Scriptum est Eliseo de Luduno Viceiustitiario Terre Ydronti etc. Significavit Excellentie nostre [...] forum miles fidelis noster per licteras suas quod in insula ipsa pro constructione eiusdem palatii faciendi de novo muri civitatis ipsius insule ex terra motibus dirupti, quem cum omni celeritate instantissime [...] nequiverint inveniri. [...] Datum apud Turrin Sancti Erasmi prope Capuam, per maistrum Guillelmum de Farumvilla etc. anno Domini MCCLXXVIII, mense februarii, XXV eiusdem VI indictione (Reg.31, f.97 t.).

The substantial nature of the reconstruction work leads us to believe that this was a destructive earthquake, even though the sources only mention two architectural structures, namely the walls and a *palazzo*. Minor secular buildings did not come within the purview of the sources of the period.

▲ 1278 02 25 shortly before

localities	lat.	long.	I
Corfu	39 37	19 55	IX

< 132 > **1279 April 30 Umbria and Marche Apennines [central Italy]**

▷ **landslides, obstruction of the Chienti river, formation of a lake** ◁

- sources 1 [manuscripts] ASMc, sez. Camerino, *Com. Camerino, Libro Rosso*, no.54
Bonav. Benv., *Chron.*, p.15; Cantinelli, *Chron.*, p.30; Salimb. Adam, *Cron.*, pp.500-1;
Miholi, *Liber*, p.553; *Ann. Placent. Gibell.*, p.571; *Contin. Pontif. Ital. II*, p.711
- sources 2 *Chron. Elwacen.*, p.38; *Ann. Foroliv.*, pp.32, 34; *Ubert. Rom., Ann.*, p.422; *Ann. Neresh.*, p.24;
Cron. S.Petri Erford. mod., p.206-207; *Ann. Polon.*, p.644; *Dandolo, Chron.*, p.326
- historiography Sigonio (1591); Lili (1649-52); Muratori (1762-64); Moreschini (1802); Acquacotta (1838-39);
Moroni (1840-79); Conti (1872); Sansi (1879-84); Gaspari (1883); Savini (1895); Santini (1984)
- literature Paciaroni (1989); Castelli *et al.* (1997); Boschi *et al.* (1998)
- catalogues d. Bonito (1691); Perrey (1848); Mercalli (1883); Taramelli (1896); Baratta (1901);
*Conversini *et al.* (1990); *Boschi *et al.* (1995, 1997, 2000)
- catalogues p. Giorgetti and Iaccarino (1971); Carrozzo *et al.* (1973); Postpischl (1985); CPTI (1999)

The most recent study of this earthquake is in Boschi *et al.* (1998). One stimulus for this work was the interest aroused by the long sequence of seismic shocks which began on the night of 26 September 1997 (*Io* = VIII-IX, *Me* = 5.9; Colfiorito earthquake, collapse in the Basilica at Assisi), continued for many months, involved a geographical area not very far from that of the 1279 earthquake, where there was no known infor-

mation about local historical seismic events. Evidence from sources closest to the event suggest that a strong earthquake occurred on 30 April 1279, affecting a vast area of the Apennines in Umbria and the Marche (central Italy), corresponding to the present-day provinces of Perugia, Macerata and Ancona. During the night of 30 April - 1 May, there was another earthquake in the border area of the Romagna region. In spite of the proximity of time and place, the two events are clearly distinguishable.

Effects of the earthquake

The worst affected localities were Camerino, where towers and houses collapsed — in particular, the bell-tower of S.Maria, the tower of S.Giacomo and a monastery — and Serravalle di Chienti, where the castle was destroyed and a landslide occurred nearby. There was also serious damage at Nocera Umbra, as well as at various unnamed small mountain castles. Substantial damage occurred at Cingoli, Fabriano, Matelica, San Severino Marche and Spello. The fact that the inhabitants of Cerreto di Spoleto held an open-air meeting by the village walls because it was dangerous to remain inside the town, is an indication that the earthquake had damaged buildings. The felt area without damage extended as far as Rome and Montecassino to the south, and Venice and perhaps Forlì to the north.

The shocks persisted for 14 or 15 (or even 17) days, but the vagueness and imprecision of such information means that we cannot attribute this sequence of shocks to the earthquake in the Umbria-Marche area or that in Romagna.

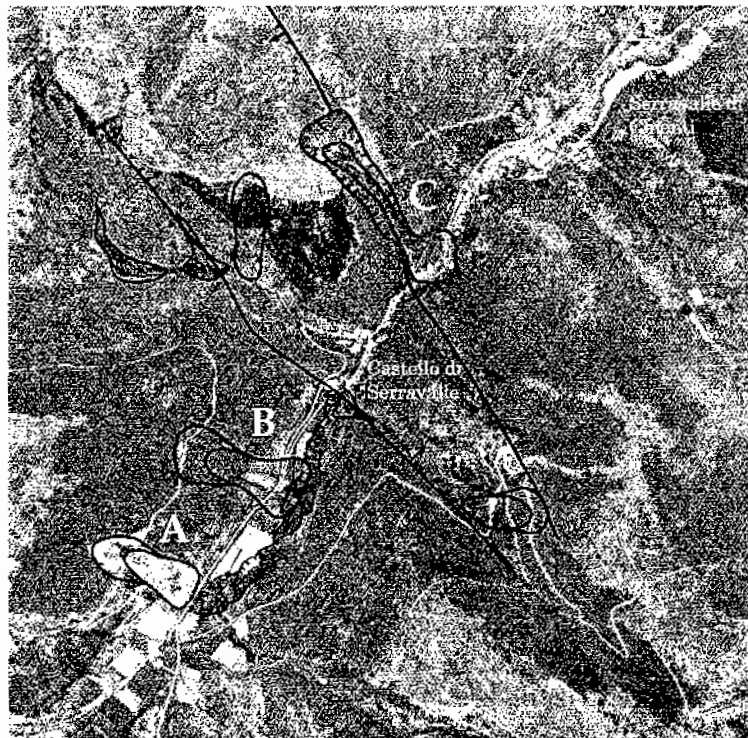


fig. 58 Castello di Serravalle, (central Italy): aerial photographs and terrain analysis have allowed geologists to identify the landslide caused by the earthquake of 30 April 1279, which is mentioned in contemporary sources and involved the Chienti river valley: the landslide was found in area C, north of Castello di Serravalle. The other two landslides, A and B, are more recent episodes. The 1279 landslide is thought to have involved about one million cubic feet of material. It has been located at a height between 950 and 560 m approximately: it apparently involved the rocky substratum, reached the valley floor and blocked the course of the river Chienti, as the sources record (from Boschi *et al.* 1998).

In attempting to put together a general picture of the area, we find that there is some uncertainty as to the situation of the castle of Serravalle. In the first place, there are many localities called *Serravalle* in central Italy, for it is a common geographical toponym in Italian mountain areas, indicating a fortified building placed in a strategic position at the "neck" of a valley. Keeping in mind this topographical feature, we tried to identify the site in question by analysing territorial information contained in medieval sources. The fact that there is a Serravalle, already mentioned in medieval sources, fairly near Nocera Umbra, led us to carry out an on-site check in the region of present-day Serravalle di Chienti. The possibility that this is the Serravalle indicated in contemporary sources as where the earthquake had substantial effects on the environment, was checked by examining its environmental, settlement and historical characteristics. Other localities remain unidentified, however, because the information provided by the sources is contained in what we might call "Chinese boxes". Their method of proceeding is to provide an identifiable place name, plus "covert" information in the form of non-localised references, and then a further identifiable element. Such narratives have the specific characteristics of the communication system of the time, which was conditioned by the oral transmission of information, so that progressive distortion took place in the various stages leading to the written text. During these stages, some items of information, such as specific geographical references, were lost, while others were added: such as qualitative aspects of phenomena, which for obvious reasons always tended to be overstated (Boschi *et al.* 1998).

In the 13th century, there were a great many castles (i.e. small fortified villages) in the mountains between Camerino and Nocera Umbra (Santini 1984). Among them was what we can now identify as that part of the inhabited area of Serravalle di Chienti known as Castello di Serravalle, situated at the head of the Chienti valley, not far from the pass which divides the Colfiorito plains (where the instrumental epicentre of the earthquakes in September and October 1997 was situated). Even today the remains of a castle can be identified in this locality — probably the one mentioned by the medieval monks, for some parts of the surrounding walls seem to date to the end of the 13th century. The river Chienti may therefore be the river referred to in the sources. It crosses the inhabited area, and at times of flood in the Middle Ages, it created a marsh (i.e. the lakes mentioned by Salimbene de Adam, a contemporary author) which was used to advantage by the local farming economy. This surface water area cannot now be found, because of land reclamation carried out by the Varano family, lords of Camerino, in the 15th century. Recent investigations have tried to identify in the field the geological effects referred to in the medieval sources. An analysis of aerial photographs on various scales and taken at various times has made it possible to identify some landslide movements in the area, both at the surface and in depth. One landslide which has proved to be of particular interest is that involving the most northerly part of the inhabited area of Castello di Serravalle. The landslide involved about a million cubic metres of material and reached the valley bottom, blocking the course of the river Chienti. That may have caused the temporary creation of marshland or the formation of a temporary lake of modest dimensions and depth immediately above the landslide deposit. Even though it is not possible to date the landslide, its morphological characteristics are still very "fresh" and clear (they date to about ten centuries ago), and so it is reasonable to suggest that the landslide is not very ancient. It could therefore be the one mentioned in the medieval sources as resulting from the 1279 earthquake (see fig. 58, p.292). The type of movement, involving the collapse of rock material which had become fractured through the presence of a fault, and the form of the deposit, largely situated at the foot of the slope, are compatible with a seismic impetus related to the shaking of the slope in an earthquake. The geological investigations were carried out by F.Guzzetti and M.Cardinali of the *Istituto di Ricerca per la protezione Idrogeologica nell'Italia Centrale* (IRPI), CNR, Perugia. The results have been published in Boschi *et al.* (1998, pp.36-8).

Historical sources

Confusion of the two earthquakes (in Umbria-Marche and Romagna) can be found as early as the medieval chronicles, where they are recorded as joint events. However, there are two independent sources, one from Umbria (Bonaventura di Benvenuto) and the other from Romagna (Pietro Cantinelli), which make it possible to distinguish between the two earthquakes, and attribute damage effects to various places.

Bonaventura di Benvenuto, a notary who lived at Foligno in the late 13th and first half of the 14th century, recorded as follows:

"1279. [...] There were great earthquakes [at Foligno] and the first earthquake was a strong one on the last Sunday in the month of April [30] after vespers".

MCCLXXIX. [...] Fuerunt magni terremotus et primus terremotus magna vi fuit die dominico post vespervas ultimo mensis aprilis.

Pietro Cantinelli was a notary from Romagna who compiled a chronicle of Faenza. He personally experienced the earthquake, and records:

"In the same year [1279], on the last Sunday in the month of April [30], at about the hour of vespers, there was a great earthquake. And indeed, towards the middle of the following night, as Monday 1 May approached, there were great earthquakes, one in particular being very powerful [...]"

Eodem anno, die dominica ultima mensis aprilis, circa horam vesperarum, fuit magnus terremotus. In nocte vero sequenti, adveniente die lune kalendarum madii, quasi circa horam medie noctis, fuerunt terremotus magni, et specialiter unus maximus fuit [...].

Cantinelli goes on to describe the effects of the earthquake in the Romagna area.

The detailed times provided by the two sources make it possible to distinguish between the two earthquakes. The first occurred in the Umbria-Marche area on Sunday, 30 April 1279 at about the hour of vespers, or shortly afterwards ("*circa horam vesperarum*", "*post vespervas*": in other words, mid-afternoon, or very roughly in the region of 14:00 UT), always assuming that the ninth hour had already been moved from mid-afternoon to midday and hence the hour of vespers from one hour before sunset to mid-afternoon. This change was adopted in monastic circles around the 14th century, but not everywhere, and not always at the same time. Consequently some uncertainty about the time remains and is very difficult to clear up. A second earthquake occurred in the Romagna area in the middle of the night of 30 April – 1 May ("*quasi circa horam medie noctis*"). For further details about this earthquake, see the next entry.

The 30 April earthquake is recorded in a considerable number of 13th-15th century chronicles.

The contemporary source which provides most details about the earthquake is the chronicle composed in the 1280s by Salimbene de Adam, a Franciscan friar. He is thought to have died in late 1288 or early 1289. We do not know exactly where Salimbene was when the earthquake occurred: was he in the affected area, or did he hear about it from fellow Franciscans? He may have gone to Reggio Emilia in late 1279. The information provided by Salimbene is also recorded by Alberto Milioli, a notary from Reggio. Salimbene and Alberto Milioli not only report damage in the Umbria-Marche area, but also provide information, albeit in briefer form, about the effects of the earthquake in Romagna. Both these authors date the two earthquakes to 1 May 1279, without giving a time of day. Salimbene writes:

"1279. In that same year, on the feast of the apostles Philip and James, which is to say on the Kalends of May [1 May]; during the papacy of Nicholas III [1277-1280], there was so great an earthquake in the March of Ancona, that two thirds of Camerino were destroyed and there were many victims of both sexes. The castles of Fabriano, Matelica, Cagli, San Severino and Cingoli were all destroyed. And so too were Nocera, Foligno and Spello. To sum up, then, all the castles situated in that part of the moun-

tains suffered serious damage. Three mountains, between which two artificial lakes and a castle had been constructed, joined together and formed a single mountain; and the lake and the river, whose overflow waters formed the lake, were completely dried up. And one castle was totally destroyed. [...] In the March of Ancona and elsewhere many quarrels were settled 'out of fear and apprehension' at the imminent danger".

Eodem anno in festo apostolorum Philippi et Iacobi, id est in Kalendis Maii, sub papa Nicholao tertio factus est terremotus adeo magnus in marchia Anconitana, quod due partes Camerini submerse sunt, et multi homines utriusque sexus perierunt. Fabrianum, Matelica, Callium, Sanctum Severinum et Cingulum, omnia ista castra sunt dirupta. Similiter Nuceria et Fulignum et Spellum. Et breviter omnia illa castra, que sunt in illis partibus montanis, multa sunt damna perpessa. Item tres montes, inter quos duo lacus et castrum erant artificiose constructi, adinvicem sunt coniuncti et pariter comminuti; et lacus et fluvius, ex cuius redundatione fiebant lacus, omnino absorti sunt. Item unum castrum omnino absortum est. [...] In marchia Anconitana multe sunt paces facte et alibi "pre timore et expectatione" imminentis timoris.

The *Annales Veronenses de Romano*, written in the 13th and 14th centuries, depart to a certain extent from the previous tradition, making a brief reference to both earthquakes, assuming they were a single event, and reporting that they were felt in Rome and at Montecassino:

"Also in that year [1279], on the last Sunday in the month of April, during the night before the Kalends of May [30 April] there was a great earthquake in the area of Romagna, the March of Ancona and almost as far as the city of Rome and Cassino [Montecassino]. In particular, 63 villages, castles and other places in that area were reduced to ruins, and a great many men and women were killed there".

Item eodem anno, die dominico ultimo mensis aprilis, de nocte venientibus Kalendis madij, fuit terremotus magnus in partibus Romaniolo, Marchie Anconitane, et quasi usque ad civitatem Romanam et Casinate: perierunt bene LXIIJ. inter villas, castra et alia loca in illis partibus, et magna multitudo hominum et mulierum perierunt ibi.

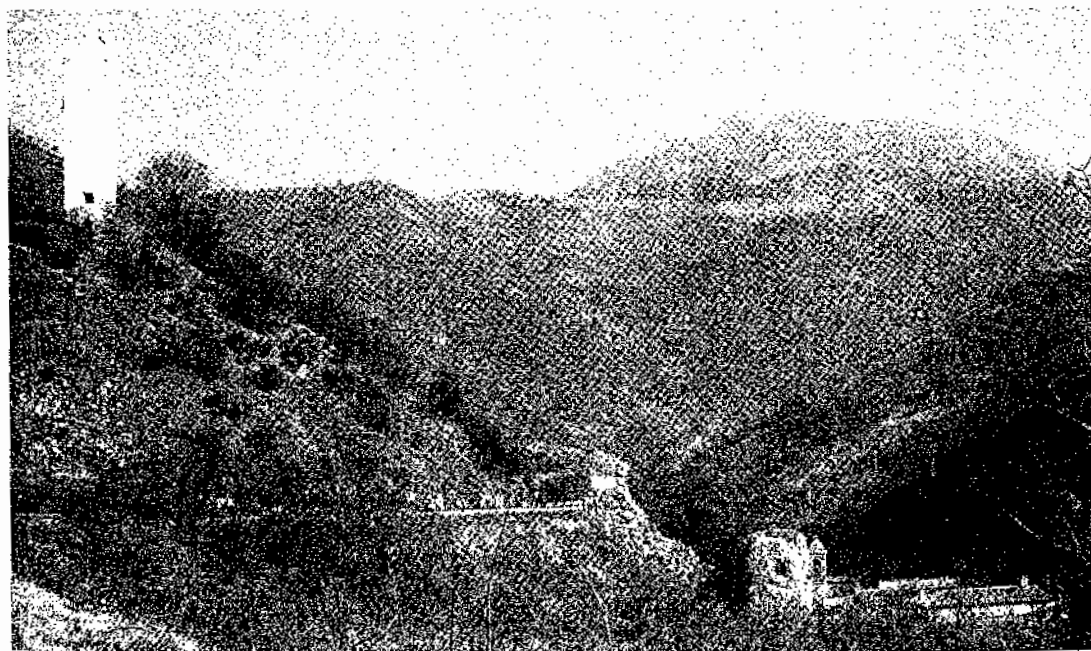


fig. 59 Castello di Serravalle: the remains of the ancient castle, probably damaged in the 1279 earthquake, in a recent photograph (from Boschi *et al.* 1998).

In the 13th century *Annales Placentini Gibellini*, there is an unclear item of information which may perhaps refer to Forlì (rather than Foligno), if the term "Furlinum", used instead of the correct "Forlivium" does indeed indicate that town: "1279, in the month of May, many castles and other places in the March of Ancona were destroyed by a tremendous scourge as far as Forlì, much of which was also destroyed, with the result that many people and animals large and small were killed".

1279. de mense Madii multa castra et loca in marchia Ancone diluvio inefabili submersa sunt usque ad Furlinum, et magna pars illius civitatis, ita quod homines et bestie magni et parvi interempti sunt.

Andrea Dandolo lived in the first half of the 14th century and was Doge of Venice from 1343 to 1354. He wrote a chronicle which not only reports the earthquake of 24 April 1279 but also indicates that Venice felt a shock on 30 April 1279, though no time of day is given. This leaves us in some doubt as to whether what was felt came from the earthquake in Umbria-Marche or the one in Romagna. Dandolo writes: "In this year [1279], on 24 April, there was a great earthquake in Venice and throughout most of Italy, and on the last day of that month, the disaster recurred".

Hoc anno, die XXIII aprilis, maximus terremotus fuit in Venecia et quasi per totam Ytaliam, et, die ultimo eiusdem mensis, eadem clades renovata est.

This same information is taken up by some manuscript chronicles dating to the 17th and 18th centuries now in the Library of the Museo Civico Correr in Venice.

The earthquake is also reported in some German chronicles. The most detailed of these is the *Chronica S. Petri Erfordensis moderna*, compiled at Erfurt towards the mid-14th century. It is the most specific in reporting — and probably exaggerating — damage at Nocera, Camerino and Serravalle di Chienti.

"The miracle of the earthquake. On the fourth Sunday after Easter [30 April 1279], the eve of the feast of St. Philip and St. James, immediately after vespers in the town of Camerino and the town of Nocera, which are situated in the March of Ancona and are exactly seven days' journey from Rome, there was a very powerful earthquake, so that all the towers and houses at Camerino collapsed and more than a thousand people were killed. In the town of Nocera, the monastery attached to the principal church collapsed with all its buildings and all the canons' curias, and more than half the town was destroyed; and there were countless victims, but the bishop survived. Nocera was situated on a mountain, and opposite was another mountain; and there was a castle between one mountain and the other, which sheltered five hundred people, and it was called Serravalle. These mountains came together and buried the castle in the middle, with all the people in it. And it is now so flattened that it is as though there had never been any buildings there. And in the surroundings of those two towns, there are other castles where there were many victims of the same earthquake. And in those regions it is considered a great prodigy. The earthquake was also somewhat felt in Rome. The pope was at dinner at the time, and the table at which he was eating and the whole palace shook in a prodigious manner. And you can be sure that this was the hidden judgment of God".

Miraculum de terre motu. In "Deo cantate", quando fuit vigilia Philippi et Iacobi, immediate post vespas fuit terre motus maximus in civitate Camerina et in civitate Nuchir, que sunt site in marchia Anconitana et distant a Roma bene ad VII dietas, ita quod Camerina omnes turres et domus corruerunt, et fuerunt mortui plus quam mille homines. In civitate Nuchir corruit monasterium maioris ecclesie cum edificiis et omnibus curiis canonicorum, plus quam media pars ipsius civitatis; et mortue fuerunt persone infinite, sed episcopus evasit. Nuchir fuit sita in monte, et fuit alius mons ex opposito; et quoddam castellum fuit situm inter alios duos montes. Ibi fuerunt bene quingenti hospites. Et habebat nomen Serovallis. Isti montes venerunt unus contra

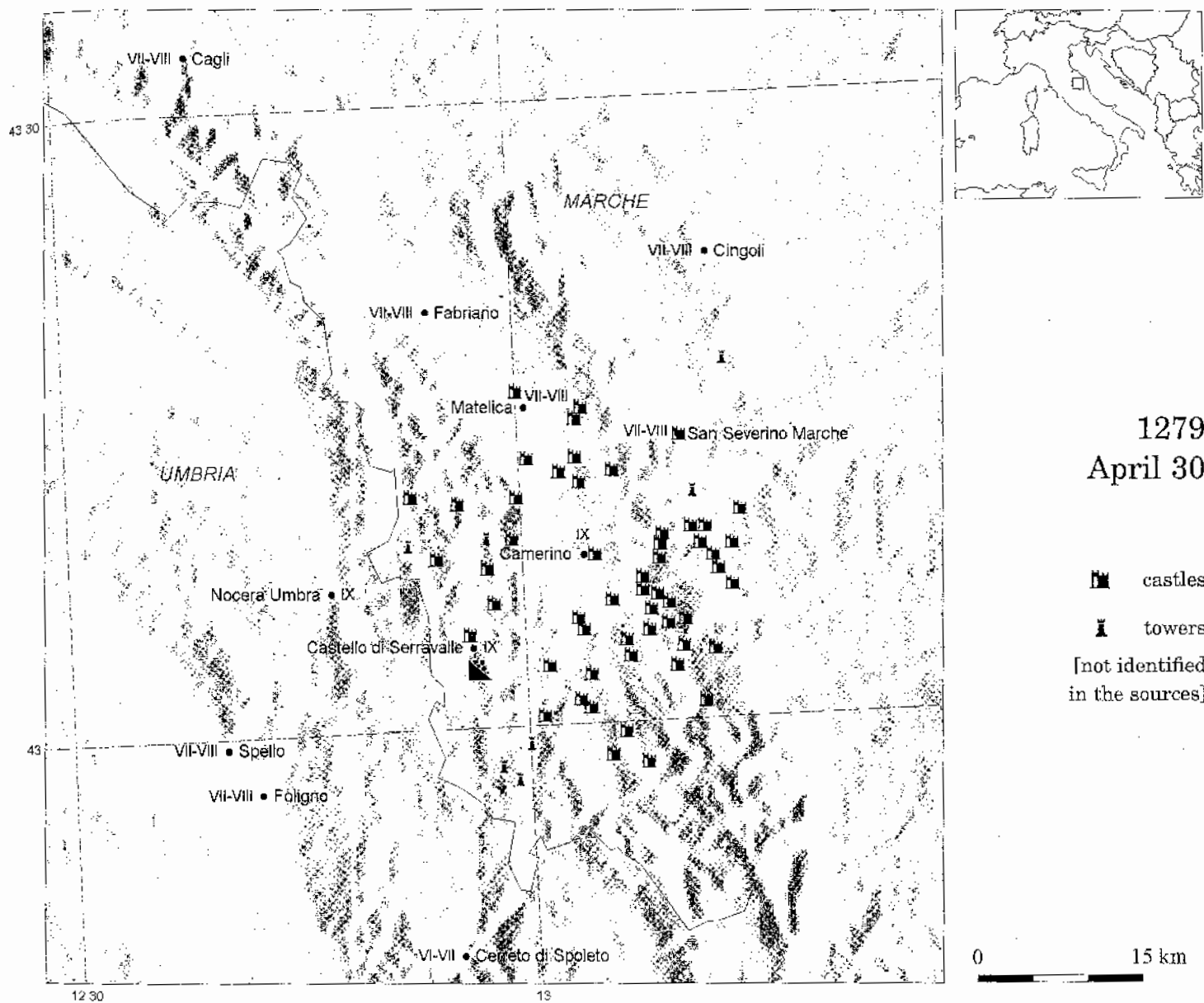


fig. 60 Border area between the Umbria and Marche regions: in addition to the 11 classified sites, for which the sources explicitly indicate damage, other castles and towers existing in the Marche region at the time of the earthquake are marked on the map (from Santini 1984): no such analysis of castles in Umbria is available. Because these 59 buildings are not specifically named in the sources, it is not possible to make a damage assessment. The map shows, however, that the area was heavily populated, and it is reasonable to suppose that the picture of classified effects involves a substantial underestimate. A map showing effects and epicentre is on p.303.

alium et cooperuerunt illud castellum, quod fuit in medio, cum omnibus personis, que fuerunt intus; et est ita planum, sicut numquam fuerunt ibi aliqua edificia. Et circa illas duas civitates sunt alia castella, in quibus de eodem terre motu perierunt homines multi. Et habetur in partibus illis pro maximo miraculo. In Roma senserant aliquantulum de illo terre motu, et papa fuit illa hora in mensa, et tabula, in qua cenavit, et totum palacium mirabiliter movebatur. Et credatis pro firmo, quod est iudicium Dei occultum.

In the *Annales Polonorum*, compiled in the convent of the Friars Minor in Cracow, and dating to the second half of the 14th and the early 15th century, particular attention is paid to the effects of the earthquake on the environment, without any specific locality being named:

"1279. [...] In that same year in Italy, on the eve of the feast of St. Mark the Evangelist [24 April], an earthquake occurred three times, causing the destruction of seven towns. Furthermore, in the mountains around Bologna, large quantities of red rain fell, at a time when the pope of the Roman Church was Nicholas III, whose name was Giovanni Gaetano. Furthermore, the earth, alas, swallowed up whole towns, which descended into the abyss with all their inhabitants, and the imploring voices of those in the abyss could be heard for four days, crying 'Mercy, mercy, O God'. Two mountains also joined up into one; and a river which ran between them was so squeezed between the mountains that it lost its bed, and so formed a lake all around, stretching for sixty miles or more and carrying everything away with it. And since the earth opened up in the earthquake, which lasted for fifteen days, some castles situated in the mountains were laid low with the mountains. Some very large mountains were completely flattened and reduced to fields, and there was a dreadful number of victims. In fact, in one Cistercian convent, fifty sisters were killed; such disasters really did occur".

1279. [...] Eodem anno in Ytalia, in vigilia beati Marci ewangeliste factus est ter motus terre, ex quo subverse sunt septem civitates. In montibus autem circa Bononiam cecidit ros sanguineus in maxima quantitate, presidente Romane ecclesie domino Nicolao papa III qui vocabatur Iohannes Gahetanus. Miserabiliter autem terra absorbit civitates, quia descenderunt in abyssum cum suis habitatoribus, et audiebatur vox clamantium per quatuor dies de abyso: Misericordiam, misericordiam, Deus. Montes eciam duo convenerunt in unum; inter quos fluebat fluvius, qui ita fuit conclusus montibus, quod nullum meatum habens fecit lacum circa se, ad sexaginta miliaria et amplius, omnia subvertens. Aliqua eciam castra in montibus sita, aperiens se terra per motum terre, qui stetit 15 diebus, ipsa castra cum montibus absorbit, aliquos montes maximos in planiciem deducens terre penitus coequavit et in populo stragem fecit miserabilem. Nam in quodam clauastro Cysteriensi quinquaginta sorores occidit; et talia multa mala facta sunt.

There are brief references to the earthquake both in the *Annales Neresheimenses*, written in the monastery of St. Ulric at Neresheim (in the diocese of Augsburg), with an original nucleus going back to the 11th and 12th centuries and continuations up to the beginning of the 15th century, as well as in the *Chronicon Elwacense*, written in the monastery of St. Vitus, St. Sulpicius and St. Servilian at Ellwangen (also in the diocese of Augsburg). The latter chronicle relies on the former. Both mention effects on the environment, though these are probably exaggerated, since the events were so distant; and overemphasis in a narrative which abandons rational descriptive elements is understandable. The generic geographical reference to the "land of the Tuscans" (*terra Tuscanensium*) might suggest that the chronicler is referring to an earthquake in the Tuscany-Romagna area, but the expression could indicate Italy in general and simply be an indistinct echo of the seismic events of 1279.

In the *Annales Neresheimenses* we find the following:

"1279. On the eve of the feast of the Apostles Philip and James [30 April], there was an earthquake in the land of the Tuscans for fourteen days, and when the earthquake ceased, the earth opened its jaws and swallowed up the city of Arezzo and [...] villages; countless hamlets were reduced to ruins by this disaster".

1279. Vigilia sanctorum apostolorum Philippi et Iacobi terre motus factus est in terra Tuscanensium per 14 dies, et terre motu cessante terra aperiens os suum absorbit civitatem Arreze et [...] villas; oppida innumerabilia diluvio perierunt.

Although the chronicles quoted above come from a cultural background which makes

them authoritative, they were not written by eye-witnesses, but presumably drew on various oral accounts circulating amongst monasteries, and through the other news channels of the time: merchants, churchmen, travellers and soldiers.

The earthquake in Umbria-Marche, so often described in conjunction with that in Romagna, comes down to us through the erudite historiography of the 16th-18th centuries, beginning with Sigonio (1591). Within this learned tradition, it is interesting to note the work of the Camerino historian Camillo Lili (1649-52, p.46), who made use of the diary of Pietro Antonio Lili, an ancestor of his from two centuries earlier (c. mid-15th century). This diary contains some details about damage to buildings in Camerino:

"On the last day of April [1279], there was a great earthquake at Camerino, in the March and in the duchy of Spoleto, and at that time the bell-tower of S.Maria, the tower of S.Giacomo, and a convent of nuns collapsed, with the result that all the nuns except one were killed".

Die ultima Aprilis Terremotus magnus fuit Camerini & in Marchia, & in Ducato Spoletano, quo tempore cecidit campanile S.Mariae, Turris S.Iacobi, Monasterium Monialium, quod omnes Moniales, praeter unam interemit.

Lili also provides a transcription of a deed of sale between the members of the noble Bulgarelli family and the commune of Camerino, drawn up in 1283, in which the earthquake of April 1279 is referred to for dating purposes.

This document is preserved in the Camerino section of the Archivio di Stato in Macerata. Here is the part referring to the earthquake:

"at the time of the earthquake in the town of Camerino in the month of April in the year of Our Lord 1279 [...] Drawn up in the year of Our Lord 1283, on 9 December, in the bishop's palace in the town of Camerino".

erant tempore terremotus qui fuit in civitate Camerini anno Domini 1279, mense aprilis [...] Actum sub anno 1283 nona decembris in palatio Episcopatus civitatis Camerini.

As regards local historiography, the archivist and historian Sansi (1879) seems to be making use of documents which are no longer available when he provides information about Cerreto di Spoleto. Other local historians report earthquake effects at Serra San Quirico (Gaspari 1883), Castelraimondo (Savini 1895) and Arcevia (Santini 1984) — localities which are not referred to in the sources.

▲ 1279 04 30 14:00 UT ⊛ = 43 06 11 46 Io = IX Me = 6.2 Sites: 14 EE:1			
localities	lat. long. I	localities	lat. long. I
Camerino	43 08 13 04 IX	Matelica	43 15 13 01 VII-VIII
Castello di Serravalle	43 04 12 57 IX EE	San Severino M.	43 14 13 11 VII-VIII
Nocera Umbra	43 07 12 47 IX	Spello	42 59 12 40 VII-VIII
Cagli	43 33 12 39 VII-VIII	Cerreto di Spoleto	42 49 12 55 VI-VII
Cingoli	43 22 13 13 VII-VIII	Rome	41 54 12 29 V
Foligno	42 57 12 42 VII-VIII	Montecassino	41 29 13 49 F
Fabriano	43 20 12 54 VII-VIII	Venice	45 26 12 20 F

< 133 > **1279 May 1 Romagna Apennines [northern Italy]**

sources 1 Cantinelli, *Chron.*, p.30; Salimb. Adam, *Cron.*, pp.500-1; Milioli, *Liber*, p.553; *Chron. de civ. Ravennae*, p.579; *Contin. Pontif. Ital. II*, p.711; Uberr. Rom., *Ann.*, p.422

sources 2 *Chron. Elwacen*, p.38; *Ann. Foroliv.*, pp.32, 34; John Victr., *Liber*, p.239; Dandolo, *Chron.*, p.326; *Cron. Ramp.*, II, p.199

historiography Sigonio (1591); Bonoli (1661); *Ann. Camaldul.* (1755-73); Muratori (1762-64); Hessel (1975); Tovazzi (ed. 1986); Repetti (1833-45); Metelli (1869-72); Davidsohn (1896-1927);

Mambrini (1935); Mancini and Vichi (1959); Veggiani (1959); Mengozzi (1979)
 catalogues d. Bonito (1691); Perrey (1848); Guarini (1880); Mercalli (1883); Baratta (1901); Milne (1911);
 *Boschi *et al.* (1995, 1997, 2000)
 catalogues p. Carrozzo *et al.* (1973); Postpischl (1985); CPTI (1999)

The sources closest to the event tell us that a strong earthquake struck southern Romagna at its boundary with Tuscany during the night of 30 April – 1st May 1279, in what are now the provinces of Forlì and Florence. This earthquake is surely quite distinct from that which occurred in the Umbria-Marche Apennines on the afternoon of 30 April.

Effects of the earthquake

The earthquake struck some villages and fortresses in the northern Apennines of Romagna. We are told in general terms that many castles collapsed with their walls in the mountain region between Bologna and Florence (or between Romagna and Tuscany), without any specific localities being indicated. The tower and castle of Fantella (situated between Portico di Romagna and Galeata in the valley of the river Rabbi in the province of Forlì) collapsed, causing some victims. The castle was never rebuilt, and in a fiscal census for the last quarter of the 14th century, ordered by the cardinal legate Anglico for the whole of Romagna, Fantella is classified as a *villa*, that is to say a non-fortified village. The ruins of the village are to be found in the Castellaccio district (near the present-day parish church of S.Maria di Fantella). At Castiglionchio (present-day Rocca di Castiglione, near Marradi, in the province of Florence), the citadel collapsed and many people were killed. The monastery of S.Ellero di Galeata (in the province of Forlì) was destroyed.

Historical sources

That two earthquakes were being confused — the one in Romagna with that in Umbria-Marche, see the previous entry — is clear as early as the medieval chronicles, where they are treated as a single occurrence. However, there are two independent sources, one from Romagna (Pietro Cantinelli) and the other from Umbria (Bonaventura di Benvenuto) which make it possible to distinguish between two of the earthquakes, and allow us to attribute damage effects to different localities. Pietro Cantinelli was a notary from Romagna who wrote a chronicle of Faenza and personally witnessed the earthquake. After noting that an earthquake struck at the hour of vespers on 30 April, he goes on:

“For towards the middle of the following night, as Monday, 1 May [1279] was approaching, there were great earthquakes, one of which was particularly powerful, so that people were terrified; it was so strong, indeed, that many castles in the mountains collapsed in ruins, and many people were buried and died in the village buildings and under the village walls. And amongst the victims was Banbo, son of Bonifacio of Sosenana, who was killed at Castiglionchio along with many others who were with him. Other victims were the children of fra' Guarnerio, son of count Glaserio da Castrocaro, who were in the castle of Fantella with their mother and the whole family, and were killed by the collapse of the tower and the castle; and many churches were also destroyed by the force of the earthquake”.

In nocte vero sequenti, adveniente die lune kalendarum madii quasi circa horam medie noctis, fuerunt terremotus magni, et specialiter unus maximus fuit, propter quod gentes plurimum timuerunt; nam, ex forcia eius, multa castra in montanis corruerunt, et conquassata sunt, et multe gentes mortue sunt sub castris et muris castrorum, que corruerunt. Et tunc mortuus est Banbus filius Bonifacii de Sosenana, in Castiglionchio, cum pluribus aliis, qui erant cum eo. Similiter et filii fratris Guarnerii filii domini comitis Glasesii de Castrocaro, qui erant in castro de Fantella, cum matre ipsorum et tota eorum familia, mortui sunt propter conquassationem turris et castris predicti.

Et multe alie gentes infinite mortue sunt, dicta occasione, in multis partibus mundi, propter domos et edificia, que corruerunt; et plurime ecclesie similiter destructe sunt propter fortiam dicti terremotus.

For the evidence provided by Bonaventura di Benvenuto, which refers solely to the Umbria-Marche earthquake, see the preceding entry.

We thus find that the Romagna earthquake happened in the middle of the night of 30 April - 1 May ("quasi circa horam medie noctis"). Since time was then still measured using the canonical hours of the church, the expression "horam medie noctis" cannot be interpreted as "12 midnight" (or 23:00 UT). It simply indicates the middle of the night in a very generic way. However, in the later *Annales Forolivienses* (15th century), which depend only in part on Pietro Cantinelli's chronicle, there is evidence which makes it possible to reach a better approximation of the time when the earthquake began, because we are told that it happened "at the time of matins" ("in matutinis"), that is to say at the time of the first morning prayers as prescribed in the rule of St. Benedict. At the period in question, this would be roughly between 3 and 3.30 in the morning (roughly between 02:00 and 02:30 UT).

The *Annales Forolivienses* (p.32) refer to the Romagna earthquake in two separate passages, in which the event at Forlì is described as "great":

"1279. [...] A great earthquake struck on 1 May at the time of matins; mountain castles collapsed in ruins, and many people died as a result of buildings collapsing".

MCCLXXVIII. [...] Magnus terremotus k[a]llende maij, in matutinis; et arces in montanis coruere, et multe gentes perierunt ex hedificijs corruentibus.

In the second passage (p.34), there is a reference to an earthquake at the hour of vespers on 30 April, and then the chronicle goes on:

"In that year [...]. At about the middle of the following night, as Monday, 1 May was approaching, there were great earthquakes. They were so powerful that many mountain castles collapsed in ruins, and there were many victims".

Eo anno [1279]. In nocte vero sequenti, adveniente die lune kallendarum maij, quasi circa hora medie noctis, fuerunt terremoti magni. Nam ex fortia ejus multa castra in montanis coruerunt et quamplurime gentes mortue sunt.

The 14th century *Chronica de civitate Ravennae* records that:

"In the year of Our Lord 1279, in the month of May, there were some very powerful earthquakes in Romagna, so that the monastery of S. Ellero di Galcata was destroyed, and many buildings in Ravenna, and there were many victims: more than a thousand".

Anno Domini MCCLXXIX. De Mense Madii. Maximi terraemotus in Romandiola fuerunt, nam Monasterium Sancti Ilarii de Galliata submersum est, et multa aedificia in Ravenna, et multi mortui plus quam mille.

The same information is recorded in the *Cronaca Rampona*, though it is given the date 1277. The interpretation of the *Chronica de civitate Ravennae* is problematical as regards both earthquake effects at Ravenna and the number of victims. The text does indeed make a clear reference to city buildings, but without a verb or adjective to indicate the reasons for the reference. A doubt therefore remains as to whether the 18th century edition has omitted a word which would elucidate the reference or whether the writer is using a Late Latin syntactical form by which the verb in one sentence is taken to apply to an adjacent sentence as well. In the latter case, the words *submersum est* used with reference to the monastery of S. Ellero would also apply to buildings in Ravenna. It is not clear from the previous chronicle whether the reported "more than a thousand" victims were at Ravenna or, as seems more likely, in the whole of Romagna. It may even be the case that they were in fact the total number of victims in the two earthquakes of 30 April and 1 May. It should be noted that the same expres-

sion "*plus quam mille*" is also used in the *Chronica S. Petri Erfordensis*, but there it indicates the number of victims at Camerino. The earthquake of 1 May is also recorded in other 13th and 14th century chronicles in Italy. The chronicle compiled in the 1280s by Salimbene de Adam, a Franciscan friar, and that of Alberto Milioli (13th century), refer not only to damage caused in Umbria and the Marche but also — though more briefly — to effects in Romagna. Both writers date the two earthquakes to 1 May 1279, without giving a time of day. Salimbene writes:

"In the same year [1279], on the feast of the Apostles Philip and James, that is to say on the Kalends of May [1 May], during the papacy of Nicholas III [1277-1280], there was such a powerful earthquake in the March of Ancona [...] In Romagna and in the mountains between Florence and Bologna, many castles and buildings were destroyed and many people of both sexes were suffocated. Indeed, so great was the fear which gripped everyone in the area that they dared not remain in their houses, not even the papal legate, Cardinal Latino".

Eodem anno in festo apostolorum Philippi et Iacobi, id est in Kalendis Maii, sub papa Nicholao tertio factus est terremotus adeo magnus in marchia Anconitana [...] In Romagnola et in montibus, qui sunt inter Florentiam et Bononiam, castra et edificia multa sunt dirupta, et multi homines utriusque sexus suffocati sunt. Tantus enim timor invasit omnes in illis partibus, quod non audebant in domibus commorari, nec etiam ipse dominus legatus cardinalis Latinus.

In the *Annales Veronenses de Romano*, written in the 13th and 14th centuries, both earthquakes are mentioned briefly and assumed to be a single event:

"Also in that year [1279], on the last Sunday in the month of April, during the night preceding the Kalends of May [1 May], there was a great earthquake in the Romagna area, in the March of Ancona, and almost as far as the city of Rome and Cassino [Montecassino]. In particular, 63 villages, castles and other places in the area were reduced to ruins, and a large number of men and women were killed there".

Item eodem anno, die dominico ultimo mensis aprilis, de nocte venientibus Kalendis madij, fuit terremotus magnus in partibus Romaniolae, Marchie Anconitane, et quasi usque ad civitatem Romanam et Casinate: perierunt bene LXIIJ. inter villas, castra et alia loca in illis partibus, et magna multitudo hominum et mulierum perierunt ibi.

There is a very brief reference to the earthquake in the *Continuatio Pontificum Italica II* (13th century):

"In his time [that of pope Nicholas III, 1277-1280], many castles in Tuscany and Romagna were reduced to ruins in a tremendous earthquake, and men were terrified".

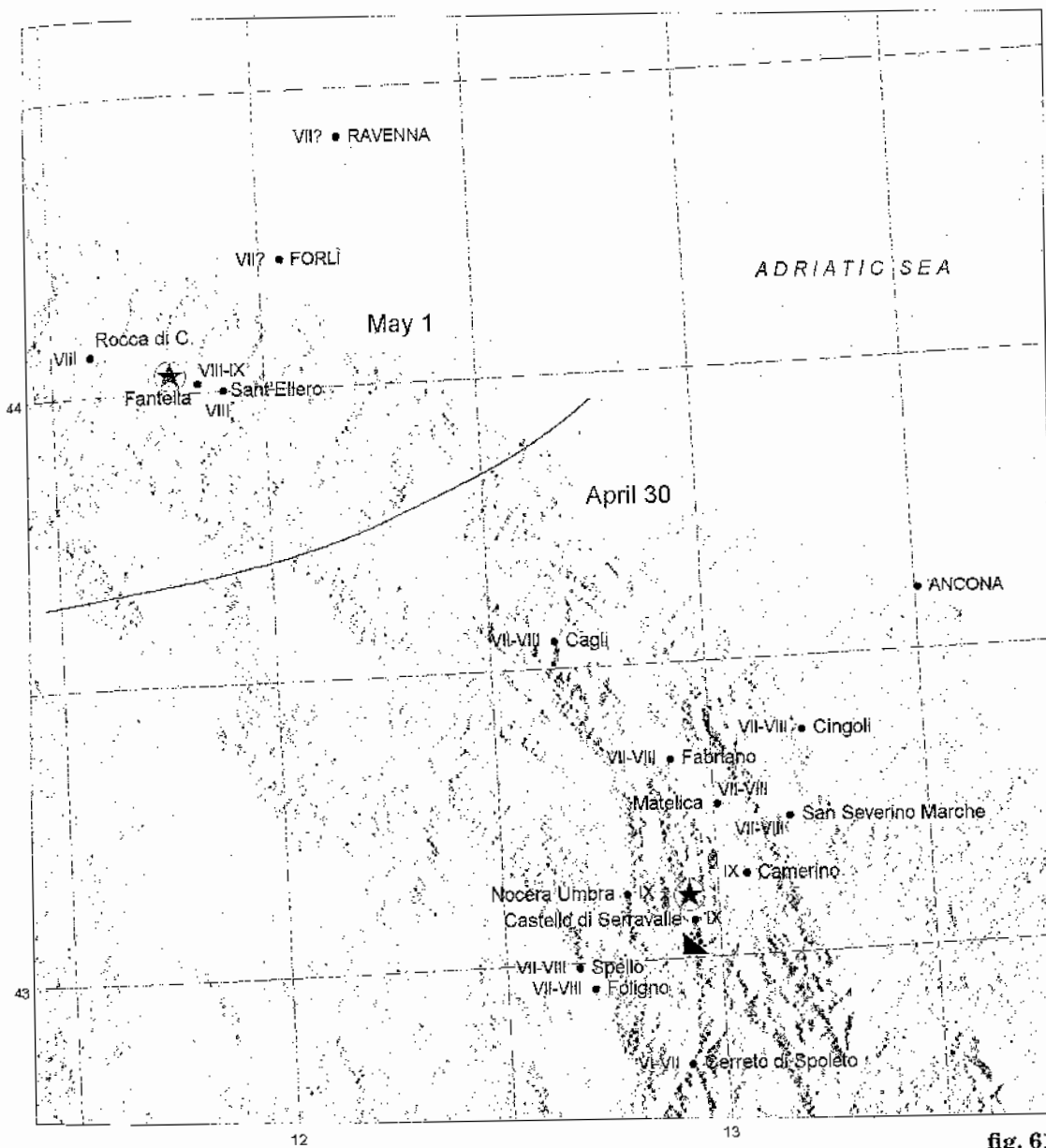
Huius tempore ex terremotu nimio multa castella Tuscie et Romandiole corruerunt cum magno hominum interitu.

According to the *Liber certarum historiarum* by Abbot John II (14th century), who dates the earthquake to 1280, people in Romagna fled from their towns and took refuge in the countryside:

"In the year of Our Lord 1280, there was so great an earthquake in Romagna that men fled from the towns and dwelt in the countryside".

Anno Domini MCCLXXX terremotus in Romaniola tantus fuit, ut homines fugerent civitates et in campestribus habitarent.

For the brief references in the *Annales Neresheimenses*, see the text and observations in the preceding entry. A thorough archive search was carried out in relation to this earthquake, but nothing was found. Once the most seriously damaged localities had been identified from contemporary chronicles, a thorough examination of documentary sources in the State Archives of Florence and Bologna was effected, in order to identi-



1279
April 30
May 1

fig. 61

fy seismic effects in the Apennine region. We also surveyed documents concerning the area under the jurisdiction of the archbishopric of Ravenna, since it included the various monasteries in Romagna, before turning to the administration of the monastery of Camaldoli. A record of the earthquake comes down to us through erudite historiography from Sigonio (1591) onwards. Romagnol local historiography does not provide us with any new information. Only Mambrini (1935, p.165) and Mancini and Vichi (1959, pp.82-3, 149) refer to the castle of Civitella di Romagna, which apparently suffered damage in the 1279 earthquake; but it is not named in any of the sources.

▲ 1279 05 01 2:00 UT ☉ = 44 02 11 47 $I_0 = VIII$ $M_c = 6.2$ Sites: 5

localities	lat.	long.	I	localities	lat.	long.	I
Fantella	44 01	11 51	VIII-IX	Forlì	44 13	12 02	VII?
Rocca di Castiglione	44 04	11 36	VIII	Ravenna	44 25	12 12	VII?
Sant'Ellero	44 00	11 54	VIII				

< 134 > **1280 January 11 – 1281 January 9** [730 A. e]
Erznka [eastern Turkey]

source 1 *Chron. min. Arm.*, II.11, p.264
 source 2 *Ar. Tabr., Book*, p.470
 historiography Incicean (1822); Kostaneanc' (1902)
 literature Abich (1882);
 catalogues d. Grumel (1958); Step'anyan (1964); Zeyt'unyan (1991)
 catalogue p. Karapetian (1991)

In the year 730 of the Armenian era (11 January 1280 – 9 January 1281), there was an earthquake at Erzincan (in present-day Turkey), but it did not cause any damage. Gregory of Kamakh (*Chron. min. Arm.*, II.11) reports: "In 730 [11 January 1280 – 9 January 1281] an earthquake occurred in Erznka, but by the grace of God it did not collapse".

Թուի՛ն Չլ շարժ եղև յերզնկան, Աստուած պահեց, որ ոչ փլաւ.

The same author uses similar words in recording an earthquake in the year 739 of the Armenian era (8 January 1290 – 7 January 1291): "In 739 a violent earthquake occurred at Erznka, but God protected it and it did not collapse".

Թու ի՛ն Չիթ սաստիկ շարժ եղև յերզնկան, Աստուած պահեց, որ ոչ փլաւ.

This last event is probably a doublet of the earthquake of 1280-1281, which is also recorded by Arakel of Tabriz.

▲ 1280 01 11 – 1281 01 09 [730 A. e]

localities	lat.	long.	I
Erzincan.	39 44	39 30	V-VI

< 135 > **1280 July 12 – August 16** **Sea of Marmara [Turkey]**

source *Pachym., Relat. hist.*, 6.24, II, p.615
 catalogue d. Evangelatou-Notara (1993)

Between 12 July and 16 August 1280, in the vicinity of Mount Auxentius (now Mount Kayis, in the Sea of Marmara hinterland between Constantinople and Nicomedia) there was an earthquake, but its effects are not specified. The reference is made within an ethical and religious context.

The earthquake occurred when the Emperor Michael VIII Palaeologus (1261-1282) was in camp near Mount Auxentius, and when, on his orders, some members of the anti-Unionist party, which rejected the Council of Lyons (1274), were tortured. Information about this earthquake is to be found in Pachymeres, a contemporary Byzantine historian:

"[...] since the earth trembled in the middle of the day, and Perdikkas expressed astonishment that the earth shook without the mountain falling on those who were carrying out these deeds, he was punished by having his nose cut off".

[...] 'Ως δ' ή γη μεσημβρίας έσειετο μεθ' ήμέραν, ό Περδίκκας, ότι μόνον ου τό τήν γην σειεσθαι, αλλά τό μη καταπίπτειν εκείνοις τό όρος, τοιαύτα πρόπτουσιν, έλεγε τεθηπέναι, ποινην ύπέσχε τήν έκτομήν τής ρινός.

▲ 1280 07 12 – 08 16

localities	lat.	long.	I
Mount Kayis	40 59	29 09	V

< 136 > **1284 January 17 Venice [northern Italy]**

- sources 1 *Additam. anon. ad Chron. A. Danduli*, col.399, note b; Giustinian, *Venet.*, p.191; *Chron. Parm.*, p.45
- sources 2 [manuscripts] BMCCorrer, Venice, Cic., 590, *Hist. ant.*; Cic., 1898, *Cron.*, chap.254; Cic., 1901, *Cron.*, fol.190r.; BNMarciannaVe, Mss. It., VII, 2557-8, Dolfin, *Cron.*; Mss. It., VII, 2052, Abbioso, *Cron.*, fol.27v.; Mss. It., VII, 37, *Cron. Venez.*, fol.44r.; Mss. It., VII, 800-1, Sanudo, *Cron. o Vite, fol.138v.*; Mss. It., VII, 1687, *Cron. Savina*, c.115v; Monaci (ed. 1758)
- historiography Bardi (1581a); Zerenghi (1626); Gallicciolli (1795); Zanotto (1859)
- catalogues d. Filippo da Secinara (1652); Bonito (1691); Perrey (1848); Mallet (1853); Mercalli (1883); Baratta (1901); Zanon (1937); *Boschi *et al.* (1997, 2000)
- catalogues p. Giorgetti and Iaccarino (1971); Carrozzo *et al.* (1973); Iaccarino and Molin (1978); Postpischl (1985); CPTI (1999)

On 17 January 1284, at about 15:30 UT (the hour of vespers), Venice was struck by an earthquake described as "very great". It is also reported to have struck Parma. This was very probably a distant earthquake, about which no further information is available at present. The epicentre is therefore unknown. As far as Venice is concerned, the earliest sources to refer to this earthquake go back to the 14th century. They are the *Additamenta anonyma ad Chronicas Andreae Danduli* and the *Venetiarum Historia* attributed to Pietro Giustinian.



fig. 62 Map of 14th century Venice (Biblioteca Nazionale Marciana, Venice, *Latini z. 399, fol.7r.*)

The *Additamenta* record:

"In the said year 1283, in the month of January, at the hour of vespers, there was a very great earthquake at Venice".

In dicto millesimo MCCLXXXIII mensis Januarii hora vespertina fuit Venetiis maximus terraemotus.

Pietro Giustinian writes in similar terms:

"Also in that year [1283], on 17 January, at the hour of vespers, there was a very great earthquake at Venice."

Item, dicto millesimo, die XVII ianuarii, hora vespertina, fuit Veneciis maximus terremotus.

Although the report gives no details of effects, it is precise in its dating. Both 14th century chronicles date the earthquake to 1283; and they are the work of notary chroniclers who were accustomed to using the traditional "Venetian style" chronology. The old Venetian tradition began the year on 1 March: that is to say, two months later than the modern style, and so the dating has to be corrected to 17 January 1284, modern style.

Such a chronological modification makes it possible to relate this earthquake to the one recorded in the anonymous *Chronicon Parmense*, a reliable notarial chronicle compiled in the first half of the 14th century, where we read:

"On 18 June [1284], a Tuesday, at the hour of vespers, the earth shook [at Parma]".

Di 18 junij in marte, in hora di vespero, tremò la terra.

The fact that the day of the week is given makes it possible to correct the indication of the month. June is given instead of January, but in Latin, their abbreviated forms are very similar ("*jun.*" and "*jan.*"). 18 January 1284 was indeed a Tuesday, whereas 18 June was a Sunday. At the time, the numbering of each day began at sunset, with the result that the date of events occurring at vespers often varies in the sources between that of the day which had just ended and that of the day following. Thus, if the chronological indication given in the *Chronicon Parmense* is interpreted "17 January 1284, at the hour of vespers", it coincides perfectly with that in the Venetian sources.

In the 15th century, this information was taken up in Venetian chronicles. Some 15th century Venetian historians, such as Dolfin, record the information as it appears in the 14th century sources without alterations or additions. But they date the earthquake to 1282. This change is probably due to their supposing that their predecessors had not used the Venetian style of dating, and that the date January 1283 corresponded to 1282 in their chronological system. Other historians, such as Marin Sanudo, dated the earthquake to 1283, as the 14th century chroniclers had done, but in Muratori's often inaccurate edition, the date given is 1282.

This variation between 1282 and 1283 persists in the historiographical tradition of the following centuries, and enters the seismological tradition: Perrey (1848) records two separate shocks: on 17 January 1282 and January 1283, though he thinks it unlikely that they were indeed separate; Mercalli (1883) lists a single shock dating to 17 January 1282; in the appendix to his catalogue (p.627), Baratta (1901), dates the earthquake to 1283, whereas he had previously given 1282, but he does not state explicitly which is to be preferred; Zanon (1937) appears to prefer 1283, but at other points in his work, the earthquake is dated to 1282.

▲ 1284 01 17 15:30 UT

localities	lat.	long.	I	localities	lat.	long.	I
Venice	45 26	12 20	VII	Parma	44 48	10 20	F

< 137 > 1284 October 13 - November 10 [Sha'ban 683 H.] Damascus [Syria]

sources al-Dhahabi, *Kitab al-Ibar*, V, p.342; al-Yafi'i, *Mir'at*, IV, p.198
 literature Taher (1979)
 catalogues d. von Hoff (1840); Perrey (1850)
 catalogue p. Poirier and Taher (1980); al-Hakeem (1988)

In the month of *Sha'ban* in the year 683 of the Hegira, which corresponds to the period 13 October - 10 November 1284, Damascus was probably struck by a strong earthquake which caused collapses and serious damage. The uncertainty as to what really happened at Damascus at that time is due to the fact that the closest source to the event, the Damascene Arab historian and theologian al-Dhahabi (1274-1348), does not refer explicitly to an earthquake, simply reporting that there were serious disturbances at Damascus caused by both natural events and warfare. However, the Yemeni Arab historian al-Yafi'i (1300-1367) maintains that the disturbances mentioned by al-Dhahabi had been caused by an earthquake.

The latter states:

"In the month of *Sha'ban*, there were great disturbances at Damascus. Egyptian troops had descended on the area; destruction occurred, and rivers overflowed their banks".

في شعبان كانت الزيادة الهائلة بدمشق بلليل وكان عسكر مصر نزالا بالوادي فذهب لهم ما لا يوصف وخربت البيوت وانطمت الأنهار.

Commenting on this passage, al-Yafi'i states:

"As far as I know, it was an earthquake; but God has greater knowledge".

وما يظهر لي معنى صحيح ولعله الزلزلة والله أعلم.

The report of an earthquake seems quite convincing, but it is not possible to establish whether there is any connection between the rivers overflowing their banks, as mentioned by al-Dhahabi, and the earthquake.

▲ 1284 10 13 - 11 10 [Sha'ban 683 H.]

localities	lat.	long.	I
Damascus	33 30	36 19	VIII?

< 138 > 1284 - 1285 winter Bar Sauma [eastern Turkey]

source Bar Hebr., *Chron. Eccl.*, I, cols.779-80
 historiography Honigmann (1954)

This earthquake is unknown to the seismic catalogue tradition. In the winter of 1285, a violent earthquake struck eastern Turkey. Many buildings collapsed at Bar Sauma, and arches collapsed at churches in the city of Melitene (near present-day Malatya). Honigmann (1954, pp.50-1) has identified the monastery of Bar Sauma in ruins at Borsum Kalesi, on a mountain about 1600 metres high between Malatya and Adiyaman, near the historical site of Nemrut Dagi (or Mount Nemrut). The source is the contemporary historian Bar Hebraeus. At the end of the first part of the *Chronicon Ecclesiasticum*, we read:

"In the year 1596 of the Greeks [1 October 1284 - 30 September 1285], in the winter, there was a violent earthquake at Melitene and its territory. The arches of churches collapsed in the town, and at the monastery of Bar Sauma so many buildings were destroyed that the whole monastery was in danger of falling off the mountain.

Ἐγένετο ἐν τῷ χειμῶνι τοῦ 1596 τῶν Ἕλλήνων ἰσχυρὴ σεισμὸς ἐν Μελιτένῃ καὶ τῷ ἐπισημοῦ μοναστηρίου τῆς Βαρσαύμας ὅσοις κτίρια ἦσαν ἐστράφησαν ἐν κινδύνῳ πρὸς τὴν ἀβυσσὸν.

... 1284 - 1285 winter

▲ 1284 - 1285 winter							
localities	lat.	long.	I	localities	lat.	long.	I
Borsum Kalesi	38 00	38 35	VII-IX	Melitene	38 26	38 21	VII-VIII?

- < 139 > 1287 February (second half) Western Syria-northern Israel
- < 140 > 1287 March 8 Hims [western Syria]
- < 141 > 1287 March 22 Laodicea

source Ibn 'Abd al-Zahir, *Tashrif*, pp.151-2
 historiography Röhricht (1898)
 literature Taber (1979)
 catalogues d. Sieberg (1932a); *Ben-Menahem (1979); Amiran *et al.* (1994)
 catalogues p. Poirior and Taher (1980); al-Hakeem (1988); Bektur and Alpay (1988)

In the month of *Muharram* in the year of the Hegira 686 (which corresponds to the period 16 February – 17 March 1287), and at the beginning of the following month of *Safar*, three strong earthquakes struck what is now the coast of Syria (the territory of Laodicea, present-day Al-Ladhiqiya) and an area of hinterland stretching from western Syria (the territory of Hims) to present-day northern Israel (the territory of Safad, present-day Zefat). The first shocks occurred in the second half of February, and damaged various Mamluk fortresses, including those of Safad and Hims. There was a fresh and violent shock on 8 March, which increased the damage at Hims, where restoration work on military buildings had already begun. The shock occurred on 22 March caused the partial collapse of a quarter of the tower at Laodicea, including the lighthouse, which was then in the hands of the Franks. The serious damage which this military building suffered facilitated the Mamluk conquest of Laodicea on the following 21 April, under the leadership of the sultan Qalawun. The source for this earthquake is the contemporary Arab historian Ibn 'Abd al-Zahir (1233-1293). He is particularly authoritative and reliable because at the time of the earthquake he was secretary to the sultan Qalawun, who was not only one of those chiefly responsible for the Muslim reconquest of the crusader states, but also actively involved during those months in the capture of Laodicea, referred to above:

“The tower [of Laodicea] rose proudly above the whole region. It was sought after by the Muslims and protected by the infidels because it rose up out of the sea without being connected in any way to the land. How could it be taken, if its moat was the sea? The Franks profited greatly from the port of Laodicea, which was comparable in importance to that of Alexandria. God willed it that in the month of *Muharram* in that year [686 H. = 16 February – 17 March 1287], there was a series of earthquakes which damaged some fortresses, including that of Safad. Half way through *Muharram*, our sultan set about repairing the damage. The fortress at Hims was also being repaired, when it was again struck by another shock on 21 *Muharram* [8 March]. During the night of Saturday 5 *Safar* [22 March], there was an earthquake in the direction of Laodicea which almost completely destroyed its tower in the sea, for God had wanted to give that region to the Muslims by protecting the tower in this way. A quarter of the tower was destroyed. The dovecot was also destroyed, as was the lighthouse which showed the position of the coast. The earthquake was a violent one and made the capture of the tower easier. When he had taken the town of Sahiyun, the Emir Husam al-Din Tarantawi, who was in command

of the sultan's troops, began the march towards Laodicea. They arrived there with catapults, whose tongues and fingers are accustomed to conveying the words and signs of victory. They set down their machines in thoroughly firm positions, and built a stone bridge. Then they thrust the battering ram [? nuqub] against those points which had been weakened in the earthquake, thereby leaving the tower undefended. In this way the position fell into their hands. [The Franks] were convinced that our sultan was fighting with the aid of the angels and earthquakes, and when things went against them, they laid down their arms and surrendered. The tower was captured on Sunday 5 *Rabi' I* [20 April]. The Muslims allowed the Franks to leave with their possessions, obliging them to abandon only their weapons. At midday the cross was removed from the top of the tower, as the muezzin made the call to prayer".

وهذا البرج شمم في أنف تلك الجهات وافة عليها من أكبر الآفات طالما أصبح وأمسى حسرة في قلب المسلمين وذخيرة لأعداء الدين وذلك أنه في وسط البحر لا تسلك إليه طريق من بر ولا ينشب له سور كيف وخندقه البحر وكان يتحصل له للافرنج مال كثير من ميناء اللاذقية التي هي مثل ميناء الاسكندرية فقدّر الله أن الزلازل في شهر المحرم من هذه السنة كثرت وفي الحصون أثرت فنها ما أضر في أسوار صفد المحروسة وتدارك مولانا السلطان تلافئها وأصلاح ما تهدم فيها وذلك في نصف المحرم و من ذلك ما حصل في قلعة حمص في حادي عشرين المحرم من هدم أسوارها وما كاد يأتي على محو آثارها وتدارك ذلك بالعمل والاتقان حتى كان الهدم ما كان. ولما كان ليلة السبت خامس صفر جاءت زلزلة عظيمة في جهة اللاذقية هدمت أكثر برجها السذي في وسط البحر لأمر يريدّه الله للمسلمين من الخير وهذا البرج كان مالك عصمتها وروح حرمتها فهدمت الزلزلة منه ربه وهدمت برج الحمام وما كان القنديل الذي يستضاء به منها ويستدل به في البحر وكانت زلزلة عظيمة شديدة وكان ذلك من الأسباب التي سهلت فتحه ومردت صرحه. فلما فرغ الأمير حسان الدين طرناوي مقدم العساكر من صهيون وانتظمت في جيش المماليك السلطانية عقودها وضفت برودها عدل إلى جهة اللاذقية وأحضر إليها الجانيق التي لا تبرح تنطق بالنصر ألسنتها وتشير بالظفر أصابعها ونصبها في أمكنة لا يثبت بها قدم المار ومد عليها جسرا من الحجار وأخذت الثقوب من جهة الأمكنة التي هدمتها الزلزلة وكشفتها من جهة البحر غير مهملة ولا مهملة فعند ذلك سقط في أيديهم ورأوا أنهم يخلون إن استمروا في تماديهم وتحققوا أن سلطاننا بملائكة يقاتل ومن جملة أعوانه الزلازل. وأن حما مهم ما بقي يطير وقبسهم ما بقي ينير فسلموا وطعلت سناجق مولانا السلطان عليها في يوم الأحد الخامس من شهر ربيع الأول فأمنوا على الخروج بنفوسهم وأموالهم وأنهم يتركون ما به من عدد وسلاح وتسلم وقت الظهر من اليوم المذكور ورمي الصليب من أعلاه عند قول المؤذن الله أكبر وتوجه كل من أهله إلى جهته.

1287 02 -

localities	lat.	long.	I	localities	lat.	long.	I
Hims SYR	34 44	36 43	VII-VIII	Zefat II.	32 58	35 30	VII-VIII

1287 03 08

localities	lat.	long.	I
Hims	34 44	36 43	VII?

1287 03 22

localities	lat.	long.	I
Al-Ladhiqiya	35 31	35 47	VIII

{ 142 } 1287 May 16 Erznka [eastern Turkey]

Sources 1 *Chron. min. Arm.*, II.4, p.148; *Sam. An., ad ann. arm. 740*; chronicle in Yovsep'ean (1951, col527 f.)

sources 2 *Chron. min. Arm.*, II.11, p.264.18-19; Ar. Tabr., *Book*, p.470
 historiography Incicean (1822)
 literature Abich (1882)
 catalogues d. Kostaneanc' (1902); Grumel (1958); Step'anyan (1964); Zeyt'unyan (1991)
 catalogues p. Ergin *et al.* (1967); Karapetian (1991)

On 16 May 1287, there was a strong earthquake at Erzincan, in present-day Turkey. It must have caused extensive damage, since we are told that there were many victims. The principal source for the earthquake is the contemporary work known as the *Annals of the Anonymous of Sivas* (*Chron. min. Arm.* II.4) which records, in a context relating to the year 736 (9 January 1287 – 8 January 1288):

“In the same year, on 16 May, a strong earthquake occurred at Eznkay. Many people died, and only God knows their number”.

Ի սոյն ամի ի մայիս 9 եղև շարժ մեծ յեզնկայ և բազումք մեռան, զորոյ թիյն Աստուած միայն գիտէ.

The earthquake is also recorded in other Armenian sources, but with different datings. The continuation of Samuel of Ani gives the date as 740 (8 January 1291 – 7 January 1292); similarly, the chronicle in Arm. Jerus. ms. 343 (in Yovsep'ean 1951, no.239), which continues Michael the Syrian up to 1346, reports the destruction of Erzincan by an earthquake in:

“1292 [*sic*] = 739. The earthquake destroyed Eznkay”.

ՌՍղբ ՉԼթ Շարժմամբ կործանեցաւ եզնկայն.

Abich (1882, p.443) dates the earthquake to 1290, on the basis of evidence from Arakel of Tabriz, whose information is similar to that in Gregory of Kamakh; but this information actually concerns a different earthquake, namely that of 1280-1281 (see the entry concerned). Kostaneanc' (1902, p.10; 21, followed by Step'anyan 1964, p.62, who creates a doublet) dates the earthquake to 1289, whereas Incicean (1822, p.17) had already listed one earthquake in 1287 and another in 1290. This is probably a case of duplication of the earthquakes of 1280-1281 and 1287.

▲ 1287 05 16

localities	lat.	long.	I
Erzincan	39 44	39 30	IX

< 143 > 1289 June Constantinople [north-western Turkey]

source Pachym., *Relat. hist.*, 8.11, III, p.151
 catalogue d. Evangelatou-Notara (1993)

This earthquake is unknown to the seismic catalogue tradition, being recorded only by Evangelatou-Notara (1993). On an unspecified day in June 1289, an earthquake was felt at Constantinople, but its effects are not recorded. This is probably a case of a distant epicentre. The earthquake occurred during a synod summoned after the resignation of the patriarch Gregory II. Information about this earthquake is to be found in Pachymeres, a contemporary Byzantine historian, who tells us that the clergy: “[...] met with the emperor in the great palace, when a sudden earthquake struck their meeting and banished all doubts”.

[...] κατὰ τὸ μέγα παλάτιον συνάμα βασιλεῖ συναθρόντων, σεισμός ἐνσκήψας ἐξαίφνης τὸν σύλλογον ἐκείνων καὶ τὴν σκέψιν διέλυνεν.

The only chronological reference provided by Pachymeres is the resignation of the patriarch Gregory II, which took place in June 1289. According to Evangelatou-Notara (1993, p.34) the earthquake occurred before 14 June, the day when Athanasius I ascended the patriarchal throne. This suggestion proves to be mistaken, however, because Athanasius began his first patriarchate on 14 October 1289.

▲ 1289 06 -

localities	lat.	long.	I
Istanbul	41 02	28 57	F

< 144 > 1293 January 11 - February 8 [Safar 692 H.] Al-Karak [Jordan]

- sources Ibn al-Furat, *Ta'rikh*, VIII, p.153; al-Maqrizi, *al-Suluk*, I, p.783; BNFrance, ms. Ar. 6739, al-Jazari, *Jawahir al-Suluk*, fol.90v-91r; ms. Ar. 1578, al-Nuwayri, *Nihayat al-arab*, fol.164r.; Ibn Kathir, *al-Bidaya*, XIII, p.233
- literature Taher (1979); Klinger *et al.* (2000)
- catalogues d. Sieberg (1932a); Amiran *et al.* (1994)
- catalogues p. Poirier and Taher (1980); al-Hakcem (1988)

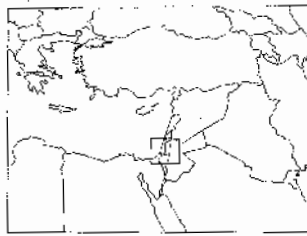
In the month of *Safar* in the year of the Hegira 692, which corresponds to the period 11 January - 8 February 1293, a strong earthquake struck Palestine, causing the most serious damage at Al-Karak, to the east of the Dead Sea (now Jordanian territory). Three towers in the citadel collapsed, as well as some other buildings. There was also comparable damage at the nearby town of At-Tafilah, where many building collapses are reported. In the coastal area (now part of Israel), there was serious damage at Ramla, where the earthquake followed a devastating flood, and caused the minaret of the congregational mosque to collapse. The earthquake also caused damage, not specified, at Gaza, Lydda (present-day Lod) and Qaqun.

The reports of this earthquake in Arabic sources are all very similar, except in the case of Ibn Kathir, who is the only historian to mention At-Tafilah amongst the places that suffered damage. The contemporary Damascene writer al-Jazari (1260-1338) reports: "In that year [692 H. = 1292-1293], there was a violent earthquake in the towns of Gaza, Ramla, Ludd [Lydda], Qaqun and Karak. The worst damage was at Karak, to the extent that three of the citadel's towers were destroyed, as were a number of buildings. The earthquake occurred during the month of *Safar* [692 H. = 11 January 1293 - 8 February 1293], and the news reached Damascus at the same time as the sultan's order, in the month of *Rabi' I* [692 H. = 9 February 1293 - 10 March 1293], to send 'Ala' al-Din al-Shuja'i, one of the emirs of Damascus, together with a group of artisans, engineers and stonecutters, with a large quantity of tools to rebuild those parts of the citadel at Karak which had been destroyed".

وفيهما حصل ببلاد غزة والرملة واللد وقاقون والكرك زلزلة عظيمة وكان معظم تأثيرها بالكرك بحيث انهدم ثلاثة ابراج من قلعتها وبنيان كثير من دورها. وكانت الزلزلة في شهر صفر ووصل الخبر الى دمشق ومرسوم السلطان في ربيع الاول بالبريد بتجريد الامير علاء الدين الشجاعى أحد امراء الشام وفي صحبته جماعة من الصناع والمهندسين والحجارين والالات الكثيرة لعمارة ما تهدم من قلعة الكرك.

Al-Nuwayri (1279-1332) provides a briefer report:

"In this year, during the month of *Safar* [692 H. = 11 January 1293 - 8 February 1293], there was a violent earthquake at the towns of Gaza, Ramla, Ludd [Lydda], and Karak. Karak was particularly affected, for three towers of its citadel were destroyed, and the Emir 'Ala' al-Dine of Damascus was sent with some artisans to rebuild what had been destroyed there".



1293
January 11 –
February 8

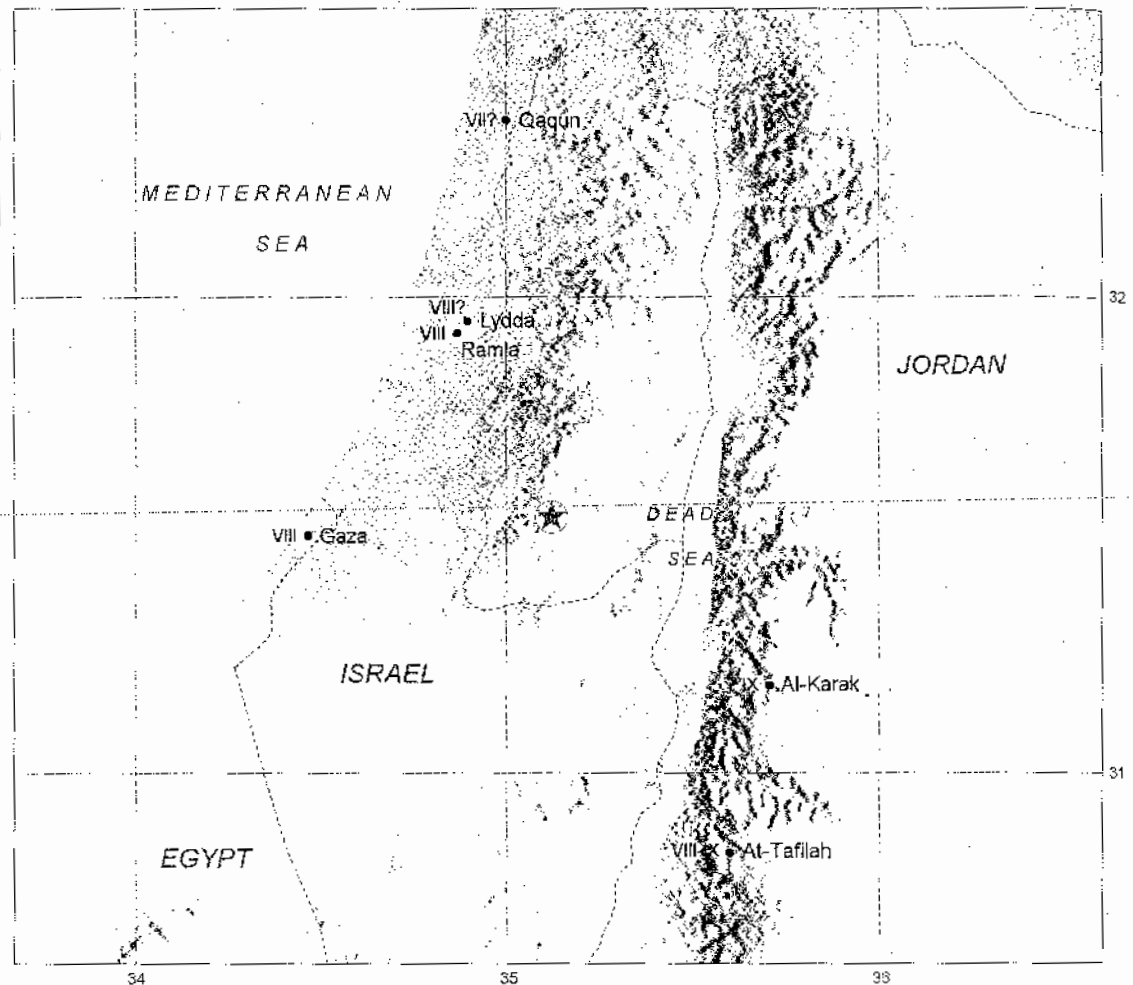


fig. 63

وفيها حصل ببلاد غزة والرملة واللد وفاقون والكرك زلزلة عظيمة وكان معظم تأثيرها بالكرك بحيث انهدم ثلاثة ابراج من قلعتها وبينان كثير من دورها. وكانت الزلزلة في شهر صفر ووصل الخبر الى دمشق ومرسوم السلطان في ربيع الاول بالبريد بتجريد الامير علاء الدين الشجاعي أحد امراء الشام وفي صحبته جماعة من الصناع والمهندسين والحجارين والالات الكثيرة لعمارة ما تهدم من قلعة الكرك.

As already mentioned, the evidence provided by Ibn Kathir (1300-1373) is important, because it also tells of damage at Tafila:

"In the month of *Safar* [692 H. = 11 January 1293 – 8 February 1293], it was very cold in Syria, and in that year there was an earthquake at Karak and many buildings were destroyed at Tafila".

وفي صفر منها وقع بدمشق برد عظيم وفيه زلزلت ناحية الكرك وسقط من تلفيتها اماكن كثيرة

Finally, al-Maqrizi (1364-1442) records:

"In the month of *Safar* [692 H. = 11 January – 8 February 1293], the towns of Ghaza, Ramla, Ludd and especially Al-Karak, were struck by a violent earthquake. Of the towers at Al-Karak, three were destroyed. A message from al-Ghars ibn Shawr, governor of Ramla, told that there had been incessant rain, causing destruction in fields and houses. The flood knocked down bridges and mills on the river 'Awja'. The bodies of eleven drowned lions were found in the flood waters. Immediately after the flood, a tremendous earthquake struck the coastal towns. The earthquake caused destruc-

tion in many places; and the minaret of the congregational mosque at Ramla was so badly cracked that it collapsed. The governor was ordered to assess the damage, and the Emir 'Ala' al-Din Aydgudi al-Shuja'i was sent with labourers and skilled workers to rebuild what had collapsed at Al-Karak".

وفي صفر الشهر المذكور حصل ببلاد غزة والرملة ولد والكرك زلزلة عظيمة كان معظمها بالكرك فإنها هدمت ثلاثة أبراج من قلعتها وورد كتاب الغرس بن شاور والي الرملة أنهى فيها وقوع الأمطار وتوالي الأشدية في الليل والنهار وهدمت أماكن كثيرة من البيوت والعقود في الرملة وقطع السيل جسورها وخربت طواحين العوجاء وكسر حجارتهما وآلاتها ووجد على السيول أحد عشر أسدا موتي قد غرقوا بالسيل وجاءت عقب هذه الزلزلة عظيمة اشتد أمرها في البلاد الساحلية وهدمت أماكن كثيرة وانشقت منارة جامع الرملة وسقطت وكتب إليه بأن يعمل لها تقدير فندب الأمير علاء الدين أيدغدي الشجاعى من دمشق وحصبته الصناع لعارة ما انهدم بالكرك.

▲ 1293 01 11 - 02 08 [Safar 692 H.] ☉ 31 32 35 07 Io = VIII-IX Me = 5.8 Sites: 6

localities	lat.	long.	I	localities	lat.	long.	I
Al-Karak HKJ	31 11	35 42	IX	Lod IL	31 57	34 54	VIII?
At-Tafilah HKJ	30 50	35 36	VIII-IX	Ramla IL	31 56	34 52	VIII
Gaza GS	31 30	34 28	VIII	Qaqun IL	32 22	35 21	VII?

< 145 > 1293 March Pistoia area [Tuscany, central Italy]

- sources 1 ASPt, *Opera di S.Jacopo*, I, fol.64v, 31 August 1293; Tol. Lucca, *Ann.*, p.219; *Chron. Parm.*, p.66; *Cron. sen.*, p.77; *Stor. pistor.*, p.16
- sources 2 ASFlorence, *Mss.*, 222, *Priorista*, fols.48-9; BAVat., *Chigiani*, G.I.31-35, G.II.36-40, Tizio, *Hist.*, fol.145r; ASPr, *Mss.*, 40, Edoardi da Erba, *Comp.*, 16th c.; Villani G., *Nuova cron.*, II, p.45; Manetti, *Chron.*, col.1014
- historiography Salvi (1656-62); Lancellotti (1673); Fioravanti (1758); Muratori (1762-64); Inghirami (1841-43); Moroni (1840-79); Davidsohn (1908); Gai (1984)
- literature Castelli (1991, 1993); Castelli and Monachesi (1996)
- catalogues d. Bonito (1691); Perrey (1848); Mallot (1853); Mercalli (1883); Baratta (1901); *Boschi *et al.* (1995, 1997, 2000)
- catalogues p. Giorgetti and Iaccarino (1971); Carozzo *et al.* (1973); Postpischl (1985); CPTI (1999)

The numerous sources which record this earthquake on March 1293 provide information solely about the city of Pistoia and its hinterland. In the city many houses collapsed and others were damaged, a vault in the cathedral fell down, and the columns of the altar of S.Jacopo were damaged. The top of the tower at the town hall also collapsed, and there were many deaths in the city and its surroundings. The life of the city was disturbed by the event, for many people left, taking refuge in tents or fleeing into the mountains. A source hitherto unknown to the seismological tradition has been discovered during our inquiry in the Archivio di Stato at Pistoia. It is in fact an administrative decision by the *Opera* of S.Jacopo (the body responsible for the upkeep of the building), dated 31 August 1293, approving expenditure for repairing the columns of the altar of S.Jacopo in the cathedral, which had been damaged in an earthquake:

"To the blacksmith master Comando and to master Jacopo da Como, for ironwork, lead, mastic, and the work of repairing the marble columns which support the ciborium of S.Jacopo, which were destroyed or damaged at the time of the earthquakes, so that they shall no longer be in disrepair and shall stand better and more firmly, 2 lire and 7 soldi".

magistris Comando fabro et Iacobo de Como pro ferramentis, plumbo, mastrice et magisterio eorum pro reaptando columpnas marmoreas que sunt et sustinent ciborum sancti Iacobi, que erant devastate et scisse tempore terremotorum, ne amplius

devastarentur et ut aptius et fortius morarentur, libras II, solidos VII.

The earthquake is also mentioned in two Latin chronicles of the period, and in two slightly later chronicles in the vernacular. The first text is the *Chronicon Parmense*, by an anonymous compiler. He acquired his information direct from Pistoia, whose *podestà* at the time was Bonifacius Lupus of Parma:

"In that same year and month, on 11 July [1293] great claps of thunder and powerful lightning flashes began and lasted for 24 days, and many very powerful earthquakes occurred there, causing many houses in Pistoia to collapse, and many were rent apart and damaged. Part of the town's cathedral church collapsed, as did the top of the tower of the town hall, and many people died as a result, and people stayed outside the town in tents and huts. And an image of the Blessed Virgin Mary which was in the cathedral performed many miracles at that time, healing the sick and restoring sight to the blind; and there was great repentance and many quarrels were settled at that time; and Bonifacius Lupus of Parma was then *podestà* of Pistoia".

Item eo anno et mense, die xj julij, in civitate Pistorij inceperunt maxima tonitrua et fulgidra magna et fortissima, et duraverunt per xxiiij dies, et maximi et plurimi ibi fuerunt terremotus, quorum occasione multe domus Pistorij diruerunt, et multe scisse et maghagnate fuerunt; et una pars maioris ecclesie dicte terre diruit et capitinus turis dicti communis, et multi homines mortui fuerunt dicta de causa, et homines stabant extra civitatem ad tendas et travachas. Et una figura beate virginis Marie, que erat ad dictam ecclesiam maiorem tunc plurima miracula fecit sanando infirmos et cecos illuminando; et fuit ibi magnum scovamentum, et multe paces ibi tunc facte fuerunt; et erat tunc potestas Pistorie dominus Bonifacius Lupus de Parma.

It is on the basis of this source that the earthquake was dated to 11 July 1293 in Baratta's catalogue (1901) and in Postpischl's (1985), which derives from it. But that date refers to the beginning of the great claps of thunder and "powerful lightning flashes" rather than to the earthquake itself. The contemporary chronicler Tolomeo da Lucca records damage at Pistoia in general terms:

"At about this period [the editor gives the date as July 1293] great earthquakes occurred at Pistoia. They lasted for a long time, and many houses were struck and damaged".

Circa ista tempora fuerunt Pistorii maximi terremotus et diu duraverunt, et multe domus et turres fuerunt ibidem concusse ac scisse.

An anonymous mid-14th century Siense chronicle in the vulgar Italian records that great earthquakes struck Pistoia in March 1293, but it does not indicate what damage was caused:

"And at this time [1293], in the month of March, there were great earthquakes at Pistoia; many people therefore fled from Pistoia, not wanting to live there for fear that they would encounter trouble; and many left the city and went to live in the mountains. And the bishop and his clergy did great penitence, making processions and fasting much to placate God. And when the month of March came to an end, all the earthquakes ceased".

E in questo tempo, del mese di marzo, furo grandi tremuoti a Pistoia; e per questo molti di Pistoia si fugiro, e non vi volevano abitare per lo sospetto di no chapitare male; e molti usciro della città, e andoro ad abitare in quelle montagne. E con molta penitenzia el vescovo chol suo chericato feceno procesioni e molte stinenzie per prachare Idio. E passato el mese di marzo furo cessati via ogni tremoto.

The Siense chronicle is more precise than the *Chronicon Parmense* in specifically dating the earthquake to March 1293 and stating that the shocks ceased after the end of the month. In the *Storie Pistoresi*, an anonymous chronicle from Pistoia whose earliest manuscript dates to 1396, we find under the general heading 1300:

"During the year 1300 since the birth of Our Lord Jesus Christ, huge, terrifying and

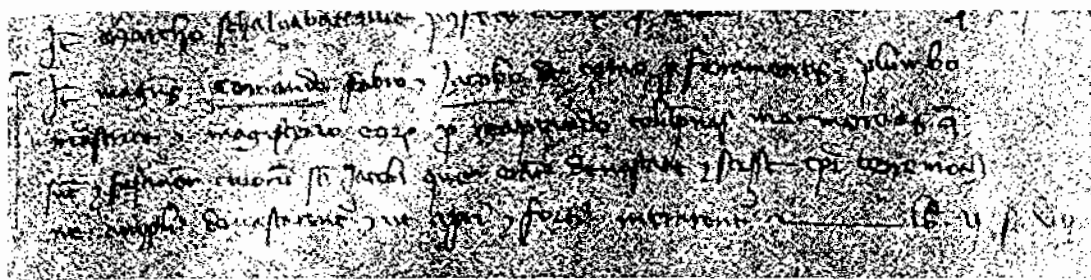


fig. 64 Pistoia: detail from the account book of the *Opera di S. Jacopo* (Pistoia cathedral). 31 August 1293 arrangements made to meet the cost of repairing the altar columns in S. Jacopo which were damaged in the earthquake of March 1293 (Archivio di Stato, Pistoia, *Opera di S. Jacopo*, 1, fol. 64v).

dangerous earthquakes occurred, which caused many houses to collapse, as well as the vault over the altar of S. Martino in the cathedral church. Such was the effect that many people died in the town and its surroundings as a result of the collapse of houses and the town walls. The inhabitants abandoned their houses and went to the *Campo* and the *Prato di S. Francesco* with tents and huts, and they also went out of the city on all sides. This scourge lasted for eight whole days. Processions were made with great piety around the city, involving all those who were left in Pistoia, men and women, adults and children alike. Many deadly quarrels were amicably settled in those eight days. When a man saw his enemy and they met in the street, of their own accord they knelt down, kissed each other on the mouth and asked each other's forgiveness. After eight days the earthquakes ceased and people were totally reassured, so they all returned home and recovered from the great fear they had felt on account of the great danger in which they had found themselves. It was not long before the people of Pistoia started quarrelling amongst themselves again, in spite of the warning signs which God had shown them in the earthquakes".

Correnti gli anni della natività di nostro Signore Gesù Cristo MCCC vennero grandissimi terremuoti terribili e pericolosi, per li quali molte case caddero, e in fra l'altre cadde la volta che era sopra lo altare di san Martino nella Chiesa maggiore: tal che per il cadere delle case e delle mura molta gente morì nella città e nel contado. Li cittadini abbandonarono le loro case e andavano al Campo o su 'l Prato di San Francesco con tende e trabacche e intorno alla città dal lato di fuori. Questa pestilenza bastò otto giorni interi: le processioni si facevano intorno alla città, dove tutta la gente che era in Pistoia, tanto maschi quanto femine, grandi e piccoli con gran devozione vi andavano. Molte paci di morte d'uomini si compuosono e feceno in quel tempo delli otto giorni: quando l'uno nimico l'altro vedeva e si scontravano nella via, da loro stessi si inginocchiavano, e baciandosi in bocca e chiedendosi perdono insieme. Passati li otto giorni, li terremuoti cessorono, e la gente si rassicurò tutta e ciascheduno si tornò a casa sua, e si rassicurarono della gran paura che avevano auta per il gran pericolo in che si viddorono. Poco stettero li Pistoiesi che ritornarono a costrattare insieme, non obstante gli pericolosi segni che Iddio gli aveva mostrati per via de' terremuoti.

All the items of information recorded by the author of the chronicle — damage to the cathedral, inhabitants fleeing from their houses, religious and pacification rituals — agree with what we find in the *Chronicon Parmense* and the *Siensese chronicle*, and therefore lead us to believe that this is the same seismic event but wrongly dated to 1300 (the opening year of the chronicle) instead of 1293. There is also a discrepancy in the name of the damaged altar in the cathedral. This chronicle calls it the altar of S. Martino, but in fact it was the altar of S. Jacopo, as is recorded in the document mentioned above in the Archivio di Stato at Pistoia. The editor of the chronicle (S. Adrasto Barbi 1907-27) points out the chronological discrepancy, but adopts no specific position

on the matter. The earthquake is recorded as occurring in 1298 in Villani's chronicle and in the *Chronicon Pistoriense* by the 15th century humanist Giannozzo Manetti. What has happened is that the earthquake of 30 November – 1 December — made more famous by the presence of the pope at Rieti at the time — has ended up by obscuring and distorting the chronology of the less well known Pistoia earthquake of 1293.

▲ 1293 03 – cumulative effects

localities	lat.	long.	I	localities	lat.	long.	I
Pistoia	43 56	10 55	VIII	■ Pistoia area	43 35	10 50	VIII

< 146 > 1293 September 4 Sannio [southern Italy]

- sources ASNa, *Uff. Ricostr. Ang.*, Notamenti, arm.1b, De Lellis, *Notam.*, vol.3, part 2, Charles II of Anjou, Orders, pp.1843 (24 November 1293), 1855 (15 May 1294, also in Bonito, 1691, p.530), 1859 (17 August 1294), 1871 (15 April 1294), 1928 (May 1296); Pandone, administrative order in Bonito (1691), p.531; Tol. Lucca, *Ann.*, p.225; Tol. Lucca, *Hist.*, col.1198; *Cron. Suess.*, p.59
- historiography Giustiniani (1797-1816); Camera (1860); Salazaro (1877); Perrella (1889); Masciotta (1952); Mazzoleni (1974-78)
- literature Castelli (1993)
- catalogues d. Bonito (1691); Perrey (1848); Capocci (1861-63); Perrella (1873); Baratta (1899, 1901); *Boschi *et al.* (1997, 2000)
- catalogues p. Giorgetti and Iaccarino (1971); Carrozzo *et al.* (1973); Postpischl (1985); CPTI (1999)

The earthquake occurred before sunrise on the early morning of Friday 4 September 1293, and struck the Samnium region. At Bojano and Tocco Caudio many buildings collapsed and there were numerous victims. In the surrounding area, villages and castles were damaged, and there was substantial damage to buildings at Isernia. In Naples, the monastery and church of S.Maria di Donnaregina may have been damaged.

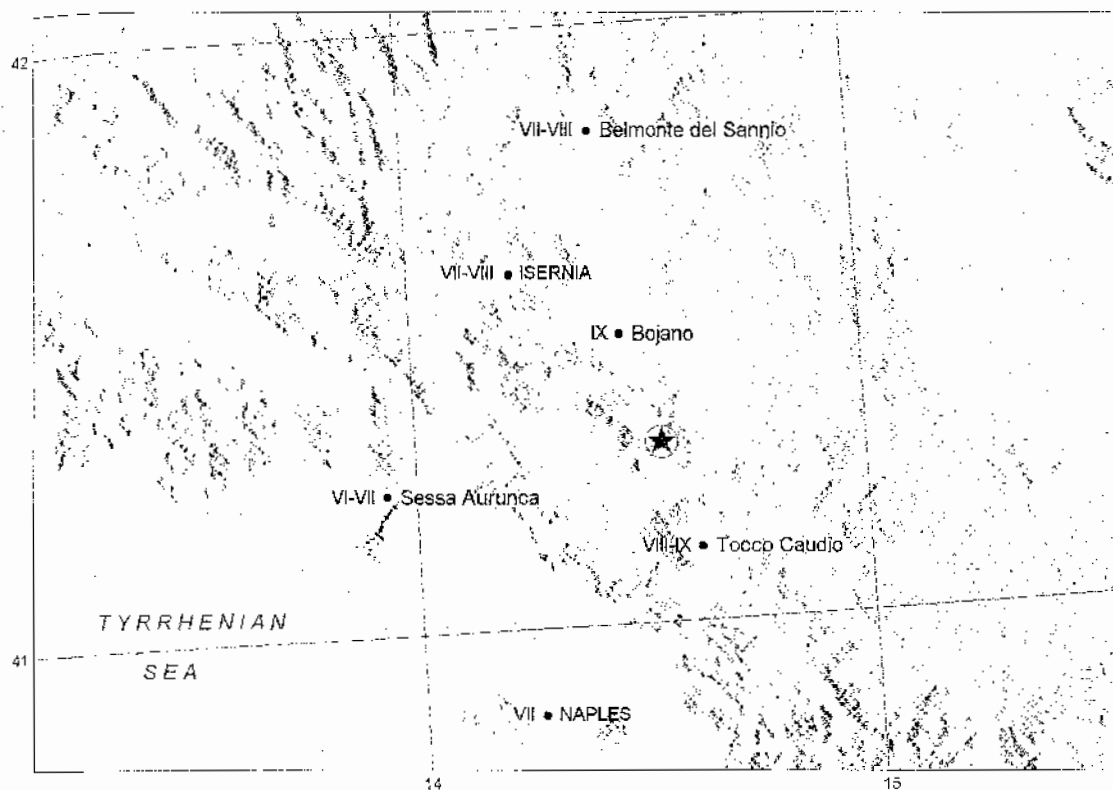
The earthquake is recorded in 6 documents from the Angevin chancery drawn up between 1293 and 1297. It is also mentioned in Tolomeo da Lucca's *Annales* and *Historia Ecclesiastica nova* and in the *Chronicon Suessanum*.

An examination of these sources has made it possible to amend the date from 1294 — as recorded by Bonito (1691), Baratta (1901) and Postpischl (1985) — to 4 September 1293. The earthquake has been studied by Castelli (1993), who used Salazaro (1877), Tolomeo da Lucca, the document dated 15 May 1294 transcribed by Bonito (1691), and only the summaries (*regestae*) of two documents concerning Isernia and Tocco Caudio. The *Chronicon Suessanum*, an anonymous chronicle of the second half of the 14th century concerned with Sessa Aurunca and its territory, had not been used by the seismological tradition, but it provides precise chronological evidence:

"In the year of Our Lord 1293. In the reign of Charles II, on 4 September, a Friday, during the night before sunrise, there was a great earthquake in the Terra di Lavoro, and in particular at Sessa".

Anno Domini 1293. Regnante Carolo Secundo die 4 Settembris, qui fuit dies Veneris, nocte ante Solis ortum teraemotus magnus factus est per terram laboris, et maxime Suessae.

The fact that this source provides a precise chronology for the earthquake, with the day of the month (4) and of the week (Friday) — and they did indeed coincide in 1293 — lends considerable authority to the information. A comparative analysis of the other contemporary sources not only makes it possible to identify the area most affected, but also confirms the dating in the *Chronicon Suessanum*. Because of the serious losses suffered by the Archivio di Stato in Naples, documents for this period have to be sought in the manuscript *regestae* of the acts of the Angevin chancery, compiled by De Lellis in



1293
September 4

0 30 km

fig. 65

the 17th century. There is also a complete transcription of two documents in Bonito (1691). These six administrative documents reveal that local lords and small landowners suffered severe economic damage and impoverishment. An order sent on 24 November 1293 by Charles II of Anjou to his son Charles Martel, Vicar of the Realm, in favour of Isnardo de Pontenes, lord of the Tocco Caudio territory, records that the country had recently suffered serious damage in an earthquake:

"[in the margin: There was an earthquake in the Pontenes territory of Tocco]. Provision for a tax reduction for Isnardo de Pontenes, knight and member of the household, who affirms that the earthquake which recently this year shook certain parts of our realm, caused a great loss of men and property in the territory of Tocco, situated in the Principality. 24 November in the seventh indiction [1293], folio 84 verso".

Pontenes terremoto occorso Tocco terra.

Isnardo de Pontenes militi familiari asserenti quod cum terremotus qui pridem infra praesentem annum nonnullas partes regni nostri concussit, magnum in terra sua Tocci sita in Principatu hominum, et bonorum damnum intulerit provisio pro alleviatione collectarum. Sub die 24 novembris 7 indictionis, folio 84 tergo.

An order addressed to the justiciar of the *Contado* of Molise in favour of the community of Isernia, drawn up on 17 August 1294, specifically dates the earthquake to the previous September 1293: "[in the margin: Isernia badly damaged in an earthquake Earthquake]. Provision for a reduction of one third in the general tax due from the community of the town of Isernia, which has aroused deep compassion and anxiety in us since the recent earthquake of last September. 17 August of the seventh indiction [1294], folio 183 verso".

Isernia travagliata da terremoto Terremoto.

Universitati civitatis Isernie, quae a terremoto proximo preteriti mensis septembris miserabiliter depressit nostri inum provisio pro alleviatione tertie partis generalis collecte. Sub die 17 augusti 7 indictionis folio 183 tergo.

There is evidence of damage at Bojano in an order from Charles II of Anjou, drawn up on 15 May 1294 and addressed to the justiciar of the *Contado* of Molise:

"[in the margin: Boiano is suffering as a result of an earthquake Earthquake]. Exemption from half the tax due from the community of the town of Bojano which, as an enquiry reveals, has suffered severe damage from the unfortunate recent earthquake, which caused the death of many men and women, 15 May of the seventh indiction, in the year 1294, folio 159".

Boiano. patisce dal terremoto Terremoto. Universitati terre Boiani, quae ex infelici eventu preteriti terremotus damna gravia pertulit, sic quod marium, et feminarum, facta est magna strages, prout ex inquisitione constat, remissio medietatis collectarum, sub die 15 madii 7 indictionis anno 1294 folio 159.

A fuller version of this document (once preserved in the Archivi della Regia Zecca of Naples) is transcribed in Bonito (1691, p.530):

"To the community of the town of Bojano, which asks for immunity from tax because of the earthquake it has suffered, the king declares that he assents. Since an investigation carried out at the behest of Charles, eldest son of our king of Hungary and Prince of Salerno, who was then Vicar General, shows that because of the sad event of the recent earthquake the town of Bojano suffered such serious damage that a great many men and women were killed, deeming it appropriate that the surviving people of that town should have some respite from their usual [tax] burden, since they themselves declare that they could not otherwise survive in that place; therefore we exempt them from half of the general tax, etc. given this 15 May of the seventh indiction, in the year 1294 of the reign of Our Lord and the tenth year of the king's reign".

Universitati Terrae Bojani petenti immunitatem a Collectis ob Terraemotum passum, Rex indulget asserens. Quia per inquisitionem factam de mandato Caroli primogeniti nostri Regis Ungariae Principis Salernitani, tunc Vicarii Generalis constat, quod ex infelici eventu praeteriti Terraemotus terra Bojani damna gravia pertulit, sic quod marium, & feminarum facta extitit magna strages, dignum reputantes quod residui homines dictae terrae de consuetis oneribus reportent aliquid relevamen, cum ipsi etiam asserant aliter inibi vivere non valere; Propterea relaxamus eis medietatem generalis subventionis, &c. sub datum die 15 Maii septimae Indictionis anno 1294 Regnorum Domini Regis anno 10.

Charles II's order sent to the justiciar of Capitanata on 15 April 1294 grants compensation to Bertrand of Belmonte, a locality in Samnium struck by the earthquake:

"[in the margin: Earthquake at Belmonte in the Kingdom]. Order for the payment of 120 *unciae* to the knight Bertrand of Belmonte, as compensation for losses suffered in the earthquake which caused damage to that area this year. To the justiciar of Capitanata, 15 April of the seventh indiction [1294], folio 245".

Belmonte Terremoto in Regno

Bertrando de Bellomonte militi provisio pro solutione unciarum 120 in compensationem damnorum passorum ex terremoto qui hoc anno praesenti in partibus illis imminuit, et dirigitur iustitiario Capitanate sub die 15 aprilis 7e indictionis folio 245.

The order sent by Charles II of Anjou to the justiciar of the Terra di Lavoro in May 1296, again in favour of Bertrand of Belmonte, states: "[in the margin: Belmonte Earthquake]. Order in favour of the knight, Bertrand of Belmonte, to whom we have granted 120 *unciae* in compensation for damage suffered in the earthquake in the year of the seventh indiction, this sum to be in full and final payment. Folio 25 verso".

Belmonte Terremoto Bertrando de Bellomonte militi cui concessimus uncias 120 in compensationem damnorum que passus est ex terremoto infra annum 7e indictionis provisio quod cum effectu solvantur. Folio 25 tergo.

A further administrative order, drawn up in 1297 in favour of Bertrand of Belmonte again, has been transcribed by Bonito (1691, p.531):

"To Francesco Pandono of Capua, Valet of the Royal Chamber and member of the household, in the name of and on behalf of his father-in-law, signor Bertrand of Belmonte, who is granted the right to harvest grain in compensation for damage which the said Bertrand suffered to his property in the latest earthquake".

Francisco Pandono de Capua Camerae Regiae Vallicto familiari, nomine, & pro parte Domini Berterandi de Bellomonte Soceri sui conceditur facultas extrahendi frumentum in recompensationem damnorum, quae dictus Berterandus passus est in bonis suis ex Terraemotu proximo successo.

Since the chronicler Tolomeo da Lucca was in southern Italy in 1293, he was close to the event in place as well as in time. He records it in his *Annales* as follows:

"The year of Our Lord 1293 [...]. In the same year there were earthquakes in various places, near Naples that is to say, and especially in the valley of Bojano, where many villages and *castelli* were reduced to ruins, and many people died there".

Anno Domini MCCLXXXIII [...]. Eodem anno fuerunt terremotus per diversa loca, nam versus Neapolym et precipue in valle de Buiano, ubi ruerunt multe ville et castra, multaeque persone ex hoc ibidem perierunt.

In his *Historia ecclesiastica nova*, Tolomeo da Lucca also writes:

"In the period when the papal throne was vacant [from 4 April 1292, when pope Nicholas II died, and 5 July 1294, when Celestine V was elected], many strange things occurred in the world. In Italy in particular there were many earthquakes, especially in the vicinity of Naples, and in the valley of Bojano, for castles and other villages were reduced to ruins, and many people died there".

In ista vacatione multae novitates apparuerunt in mundo, primo quia in Italia fuerunt multi terraemotus, seo maxime versus Neapolim, in valle videlicet de Bivano, quia ruerunt castra, et villae, et multae personae perierunt ibidem.

In both chronicles, Tolomeo da Lucca uses similar terminology to record the earthquake, but in the *Annales* he specifies the year as 1293, and the name of the locality changes from "Bivano" to "Buiano". The town is now called Bojano, and lies about 90 km from Naples. Baratta (1899) catalogued a earthquake at Naples in 1293 on the basis of Salazaro (1877), who reported damage to the church of S.Maria di Donnaregina in Naples as a result of an earthquake which he simply dated to 1293. The evidence resulting from our research makes it appropriate to attribute this damage to the earthquake of 4 September 1293.

▲ 1293 09 04 ☉ = 41 18 14 33 I₀ = VIII-IX Me = 5.8 Sites: 6

localities	lat.	long.	I	localities	lat.	long.	I
Bojano	41 29	14 28	IX	Isernia	41 36	14 14	VII-VIII
Tocco Caudio	41 07	14 38	VIII-IX	Naples	40 51	14 16	VII
Belmonte del Sannio	41 49	14 25	VII-VIII	Sessa Aurunca	41 14	13 56	VI-VII

< 147 > 1293 December 2 - 1294 November 20 [693 H.] Cairo [Egypt]

sources al-Suyuti, *Kashf*, p.50; al-Suyuti, *Husn*, II, p.210

catalogue d. *Ambraseys *et al.* (1994).

In the year of the Hegira 693, which corresponds to the period 2 December 1293 - 20 November 1294, there was a strong earthquake in the Cairo area, which damaged the

mosque in new Cairo and dislodged some columns in then the 'Amr mosque in the Fustat district. As Ambraseys *et al.* (1994) have maintained, it is possible that this earthquake and the one recorded as occurring in Palestine in January – February 1293 are in fact the same one; but the sources do not provide sufficiently precise information to confirm that. The earthquake in Egypt is recorded by the famous Cairo Arab historian, al-Suyuti: "There was so strong an earthquake throughout the area (*iqlim*) of the city of Cairo (*Misr*) that some columns in the Amru mosque struck against one another. However [the effects] were slighter than those in the cathedral mosque of new Cairo (*al-Qahira*)".

كانت زلزلة أثرت في سائر إقليم مصر حتى أن بعض جامع عمرو انفصل بعضه عن بعض وكان أخف مما حدث في جامع القاهرة.

▲ 1293 12 02 – 1294 11 21 [693 H.]
 localities lat. long. I
 Cairo 30 03 31 15 VI-VII?

< 148 > 1295 September 1 – 1296 August 31 [6804 B. s.] Sicily [southern Italy]

source Notula in Evangelatou-Notara (1984, p.173, no.571)
 literature Guidoboni and Traina (1996); Valensise and Guidoboni (2000)

This earthquake is known to historians, but is not listed in currently used Italian catalogues. On an unspecified day between 1 September 1295 and 31 August 1296, there was a destructive earthquake in Sicily, causing town walls to collapse at unspecified places. The earthquake is recorded in a *Notula* published by Evangelatou-Notara (1984, p.63, no.203), but not in her catalogue of earthquakes in the Byzantine region and areas under Byzantine influence (Evangelatou-Notara 1993). It was not previously known to the tradition of seismological studies, but has been mentioned by Guidoboni and Traina (1996, pp.1215-6), within the framework of a review of earthquakes in Sicily up to the end of the 13th century.

The source is a *Notula* in a *Typikon* (a liturgical book of the Byzantine Church) belonging to the Greek liturgical tradition (ms. *Vaticanus Graecus*, 1877, fol.13v.). It states: "[...] at the tenth hour of the night, there was a great earthquake in the island of Sicily [...] with the result that all the walls collapsed. In the year 6804 [1 September 1295 – 31 August 1296], in the ninth indiction".

[...] ώρα δεκάτ(ε) τῆς νυκτος ἐγένετο σεισμός μέγας ἐν τῇ νήσῳ Σικελ(ίας) [ῥῶσ|τ|ε] κλωνεῖσθ(αι) τὰ τύχ(ε) πάντ(α) Ἐν ἔτ(ε)ι ,σῶδ' ἰνδ(ικτιῶ)ν(ος) θ'.

Evangelatou-Notara (1984, p.173 no.571) simply gives the year 1296, without explaining the reasons for her choice.

▲ 1295 09 01 – 1296 08 31 [6804 B. s.]
 localities lat. long. I
 Sicily 37 30 14 00 VIII-IX

< 149 > 1296 June 1 Constantinople [north-western Turkey]

< 150 > 1296 June 13 Constantinople

sources 1 Pachym., *Relat. hist.*, 9.15, III, pp.259, 261; Gregoras, *Hist.*, 6.9, I, pp.202, 215-16;
Notula in Mercati and Franchi de' Cavalieri (1923, p.226) and Turyn (1964, pp.91-2);

- Notula* in Richard (1955, pp.332-3), previously in Lampros (1910, p.137, no.39)
- source 2 [Sphr.], *Chron. Maius*, p.176
- literature comets: Oppolzer (1887)
- historiography Grecu (1966); Müller-Wiener (1977); Ducellier (1980)
- catalogues d. Bonito (1691); Perrey (1850); Mallet (1853); Schmidt (1881); Dück (1904); Downey (1955); Galanopoulos (1955); Grumel (1958); Galanopoulos (1961); *Galanopoulos (1981); Ambraseys and Finkel (1991); Evangelatou-Notara (1993); *Papazachos and Papazachou (1997)
- catalogues p. Ergin *et al.* (1967); Shebalin *et al.* (1974)

Towards midnight on 1 June 1296, a strong earthquake struck Constantinople, causing the collapse of many ancient buildings, destroying many new buildings as well, and producing cracks in the city walls. At the church of All Saints, which had already been damaged in the earthquake of 1010, part of the roof collapsed above the altar and the nave. A bronze statue of the Archangel Michael, erected by the Emperor Michael VIII Palaeologus (1261-1282), also fell from its position on a column. The Emperor Andronicus II Palaeologus (1282-1328) was away from Constantinople at the time, but immediately returned to the city. This earthquake was compared in strength to an earlier earthquake — perhaps that of 11 March 1231. A succession of minor shocks continued during the months of June and July; on 13 June there was a powerful shock. The emperor had the statue of the Archangel Michael restored, as well as the city walls (Müller-Wiener 1977, p.293). The church of All Saints does not seem to have been restored, however, and it lay in ruins until the end of the 14th century. In 1391, its stone was used for rebuilding the Golden Gate (Müller-Wiener 1977, p.406).

Information about this earthquake can be found in two contemporary Byzantine historians, Pachymeres and Nicephorus Gregoras, as well as in some Byzantine *Notulae*. Pachymeres is the richest source of information. Within the context of June 1296, he relates:

“And on the first day of the month, in the evening, as midnight was approaching, there was a great earthquake, which caused living bodies to pulsate. Authors who wrote about it say that these pulsations were extremely disastrous, because they passed through the under-soil and shook foundations. Neither young nor old had experienced an earthquake of greater or even of equal power. Some of the elderly compared it to the ‘great’ earthquake. So this one, too, lasted for many days, and often by day or night the aftermath of the exhalation was experienced until 17 of *Asterion* [an archaism for July], but less powerfully [...]”.

Καὶ τῆς πρώτης τοῦ μηνὸς ἐσπέρας, περὶ ποῦ τὸ μεσονύκτιον, σεισμὸς ἐμπίπτει μέγας, κατὰ τοὺς τῶν ζώντων σωμάτων σφυγμούς· οὗς μᾶλλον καὶ δεινοὺς οἱ περὶ τούτων γράψαντες λέγουσιν, ὡς κάτωθεν διένοντας καὶ ὑποσπῶντας θεμέλια. Τόσος γοῦν ὁ τότε ὥστε καὶ μηδένα ἔχειν μὴ παλαιὸν μὴ νέον εἰδέναι, μὴ ὅτι γε μείζω, ἀλλ’ οὐδ’ ἴσον πώποτε. Τινὲς δὲ τῶν ἤδη γεγηρακότων τῷ κατ’ ἐξοχὴν λεγομένῳ μεγάλῳ ἐκείνον παρείκαζον· οὕτω γὰρ καὶ τοῦτον ἐφ’ ἡμέρας πλείσταις ἐπισημαίνειν καὶ πλειστάκις τῆς ἡμέρας ἢ καὶ νυκτὸς προφαίνειν κατὰ μικρὸν τὰ τοῦ πνεύματος ἐγκαταλείμματα, ὥστε καὶ ἀνθεστηριῶνος ἑπτακαιδεκάτῃ ἐνταῦθα μὲν πλείω μὲν τὸ τοῦ χρόνου μῆκος γενέσθαι, μαλακώτερον δὲ τῇ δυνάμει [...].

Pachymeres goes on to deal with an earthquake at Pergamum and Chliara on 17 July 1296, and then returns to describing the effects of the earthquake of 1 June at Constantinople:

“The first earthquake, which we have described as ‘great’, struck the City [of Constantinople] violently, causing the collapse all round it of many buildings which had been there since ancient times; and it also destroyed many new buildings. The ornamental dry-stone cornices of walls could be seen in heaps on the ground, looking like the piles of stones which builders bring in from other places when they are preparing

to erect a building. The collapse of two great works of architecture demonstrates the violence of the earthquake. The church of All Saints which had remained standing until then and was in perfect condition, was pitifully destroyed. That part of the roof above the altar and the nave collapsed. And there was a bronze statue of the Captain of the Heavenly Host standing on a column with the Emperor Michael at his feet offering him the city and placing it in his safe-keeping. The fate suffered by the statue and the city in the hands of the emperor was that the former lost its head, while the latter rolled away from the emperor's hands, and they both fell to the ground. What happened was that at dawn the whole city ran to the Great Church [St. Sophia] and devoted themselves to prayers and litanies. And when the emperor, who was outside the city as we have said, realised how great was the disaster, he was afraid that the whole city had been swallowed up, but above all he feared for the Great Church, so he sent many messengers all at the same time to see from a distance whether it was still standing. In addition, the emperor interpreted the earthquake as a bad omen for his expedition and decided to turn back. He crossed the strait in the morning, amazed at the extent of the disaster and the divine wrath which had caused it".

Τοῦ γοῦν πρώτου σεισμοῦ καὶ καθ' ἡμᾶς μεγάλου ἐνσκήψαντος, πολλὰ μὲν ἀναστήματα τῶν κατὰ τὴν πόλιν κατέπιπτον, ἐκ παλαιοῦ τὸν ἐδρασμὸν ἔχοντα, πολλὰ δὲ καὶ τῶν νέων οἰκιῶν κατηρέϊοντο. Τοὺς δὲ γε τῶν αὐλαίων θριγκούς, οἱ καὶ ἐκ ξηρῶν συνίσταντο λίθων, κατὰ σωρείαν ἕκαστον εἶδέ τις κείμενον, ὅμοιον ὡς ἂν ἐπισωρευθέντων ἄλλοθεν, ὁ τεχνίτης τοὺς τοίχους ἐμελλε συνιστάν. Δύο δ' ἔργα τῶν μεγάλων πεσόντα τὴν βίαν ἐσήμηνε τοῦ κινήματος. Ὁ γὰρ τῶν Ἁγίων ἀπάντων ναὸς, ἐς τότε συνεστηκὸς καὶ μηδενὸς τῶν ἀναγκαίων λειπόμενος, ἐλεινὴν θραῦσιν πάσχει καὶ πῶσιν τῆς ὀροφῆς, ὅση τε περὶ τὸ βῆμα καὶ ὅση περὶ μέσον ἀνφοδομήτο. Καὶ ὁ ἐκείσε χαλκοῦς ἀνδριάς τοῦ Ἀρχιστρατήγου, ὁ ἐπὶ κιονώδους μὲν ἐρηρυσμένος τοῦ ἀναστήματος, ἐς πόδας δ' ἔχων τὸν ἀνακτα Μιχαήλ, τὴν πόλιν φέροντα κάκεινῳ προσανατιθέντα καὶ μὴν ταύτης φυλακὴν ἐπιτρέποντα, ὁ τοιοῦτος οὖν ἀνδριάς καὶ ἡ ἀνά χειρᾶς τῷ βασιλεῖ πόλις, ὁ μὲν τὴν κεφαλὴν ἀφαιρεῖται, ἡ δὲ τῶν χειρῶν τοῦ κρατοῦντος ἐξολισθαίνει, καὶ πρὸς γῆν ἀμφὼ πίπτουσι. Τούτων οὖν συμβάντων, ἡ μὲν πόλις πᾶσα, ὑπ' αὐγᾶς τῆς ἡμέρας τῷ μεγάλῳ νεῷ προσδραμόντες, ἰκεσίαις ἐνεσχόλαζον καὶ λιταῖς· ὁ δὲ γε βασιλεὺς, εὐρεθεὶς ἔξω τῆς πόλεως, ὡς εἰρήκαμεν, καὶ τὸ δεινὸν ἐννοήσας ὅποιον, ἐδεδίει μὲν καὶ περὶ τῆς πόλεως πᾶσης, μήπως κατεπόθη, ἐδεδίει δὲ μᾶλλον καὶ περὶ τῷ μεγάλῳ νεῷ, ὥστε καὶ συχνοῦς τῆς αὐτῆς ὥρας πέμπειν, ὡς γνῶσι, μακρόθεν ἰδόντες, εἰ ἴσταται. Τέως δὲ καὶ τὴν ἐξοδὸν οὐκ ἀγαθὴν ἐντεύθεν οἰωνισάμενος, ὑποστρέφειν ἔγνω καὶ ἀντιπεραιούται πρῶτα, ἐκθαμβούμενος οἶον, καὶ μῆνιμα θεῖον, ὅπερ καὶ ἦν, τὸ δεινὸν ἐκεῖνο ποιούμενος.

Nicephorus Gregoras records the earthquake before the death of John II Comnenus of Trebizond (16 August 1297) and after his account of matters connected with the rebellion of Alexius Philanthropenus (late 1295 – early 1296):

"At that very time, there was an earthquake of enormous proportions, which caused many palaces and churches to collapse or crack. The statue of the Archangel Michael also collapsed. The Emperor Michael Palaeologus had set it up on a column in front of the church of the Holy Apostles, at the time when he governed Constantinople. His son Andronicus restored it to its original state and set it up again.

Κατὰ τοῦτον μέντοι τὸν χρόνον συνέβη γενέσθαι σεισμὸν τῶν πάντων μεγίστων, ὑφ' οὗ πολλὰ μὲν τῶν μεγάλων οἰκιῶν, πολλοὶ δὲ τῶν μεγάλων νεῶν οἱ μὲν ἐπεπτώκεισαν, οἱ δὲ διερράγησαν. ἐπεπτώκει δὲ καὶ ὃν πρὸ τοῦ νεῷ τῶν ἁγίων ἀποστόλων ἐπὶ κίονος ἔστεσε τοῦ ἀρχιστρατήγου Μιχαήλ ἀνδριάντα Μιχαήλ βασιλεὺς ὁ Παλαιολόγος, ὁπότε τῆς Κωνσταντινουπόλεως ἐγκρατὴς ἐγεγόνει· ὃν αὐθις Ἀνδρόνικος βασιλεὺς, ὁ ἐκεῖνον παῖς, ὡς εἶχε σχήματος, ἐπεσκεύασέ τε καὶ ἀνεστήλωσε.

In a codex which is now split between Athos Vatopediou 290 and Paris Supplementum

gr. 682. I, there are annotations of some interest (Richard 1955, pp.332-3). In Vatopediou 290, we read at fol.83:

"On 1 June, in the ninth indiction [1 September 1295 – 31 August 1296], on the sixth day [Friday], before cockcrow, there was a great earthquake and many walls of the city collapsed and churches were split open. It lasted for eight days. In the year 6804".

Μηνὶ Ἰουνίῳ α', ἰνδ. θ', ἡμέρα ε', πρὶν ἀλεκτριώνων ὠδᾶς ἐγένετο σεισμός μέγας καὶ ταῖχαι πολλὰ τῆς πόλεως] κατέπεσον καὶ ναοὶ διερράγησαν. ἐπεκράτησεν δὲ ἡμέρας ὀκτώ, ἔτους δὲ κωδ'.

And in Paris. Suppl. gr. 682, we read at fol.8v:

"And again on 13 of the same month, on the fourth day [Wednesday], there was a earthquake at the seventh hour of the day".

Καὶ πάλιν τὸ αὐτὸ μηνὶ τῇ ιγ', ἡμέρα δ', ἔσυσεν περὶ ὥραν ζ' τῆς ἡμέρας.

And further on in the text we find: "And a(gain)..." (Καὶ πα...). Another shock must have taken the annotator by surprise. There is a comment in another hand: "Great fright!" (Φόβος μέγας).

In 1296, 1 and 13 June were indeed a Friday and a Wednesday respectively.

The *Notula* in codex *Vaticanus graecus* 191, fol.319v. (published in Mercati and Franchi de' Cavalieri 1923, p.226, and in Turyn 1964, pp.91-2), takes a broader view:

"On the first day of June, a Friday evening, at the third hour of the night, in the ninth indiction, in the year 6804, which was a leap year, when the moon was in conjunction with the sun, there was a great and terrifying earthquake at Constantinople, such as had not been experienced for many generations, and the walls of the city and churches split open, during the reign of the very pious Emperor Andronicus Comnenus Palaeologus and his son, the very pious Emperor Michael. Fifteen days earlier there had been an eclipse of the moon. From that moment on there were shockss almost every day, by night and by day, throughout the months of June and July, but of lesser intensity [...]"

Μηνὶ Ἰουνίῳ πρώτη ἡμέρα παρασκευῆ: ἑσπέρας ὥρα τρίτη τῆς νυκτός, ἰνδ. θ', ἔτους κωδ' ὅτε καὶ βίσεξτος ἦν καὶ πάσχα κύριον: συνοδευούσης τηνικαῦτα ἡλιῷ σελήνης, σεισμός μέγας καὶ φοβερός ἐγεγόνει εἰς Κωνσταντινούπολιν: οἶος πρὸ πολλῶν γενεῶν οὐκ ἐγένετο: ὅτε καὶ τὰ τεῖχη τῆς πόλεως καὶ οἱ ναοὶ κατερράγησαν: καὶ οἰκίαι πολλὰ κατέπεσον: ἐπὶ τῆς βασιλείας Ἀνδρονίκου τοῦ εὐσεβεστάτου βασιλέως Κομνηνοῦ τοῦ Παλαιολόγου: καὶ Μιχαὴλ τοῦ εὐσεβεστάτου βασιλέως καὶ υἱοῦ αὐτοῦ: πρὸ δεκαπέντε δὲ ἡμερῶν καὶ ἔκλειψις τῆς σελήνης ἐγένετο. ἔκτοτε δὲ καθημέραν σχεδὸν σεισμοὶ νυκτός καὶ ἡμέρας διόλου τοῦ Ἰουνίου καὶ τοῦ Ἰουλίου ἐγένοντο τῇ σφοδρότητι μείονες. [...].

The *Notula* goes on to record the earthquake of 17 July 1296 (see the next entry). The eclipse of the moon, which is mentioned in passing, in fact took place on 18 May (Oppolzer 1887, p.363). This earthquake on 1 June may be the one recorded by Pseudo-Sphrantzes (in the work known as the *Chronicon Maius*), in a context which cannot be dated exactly, but belongs roughly to the first quarter of the 14th century:

"At that time [after the nomination of Isaias as patriarch of Constantinople on 11 November 1323], a very great earthquake occurred: many splendid palaces and holy churches collapsed or split open. And many columns standing on columns fell down".

Ἐν ἐκείνῳ τῷ χρόνῳ συνέβη γενέσθαι σεισμόν τὸν παμμέγιστον καὶ πολλοὶ οἰκοὶ περιφανεῖς καὶ τῶν ἁγίων ναοί, οἱ μὲν πεπτώκασιν, οἱ δὲ ἐρράγησαν: καὶ πολλοὶ στῦλοι τῶν ἱσταμένων εἰς τοὺς κίονας ἄνωθεν ἔπεσον.

Greco (1966, p.177) translates *stuloi* as "chipuri" ("images"). He thinks that these were statues on columns; but such an interpretation is not justified by the text which has come down to us. In fact the reference is to the statue of St.Michael/Michael

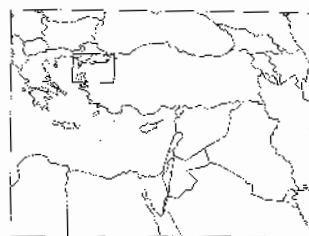
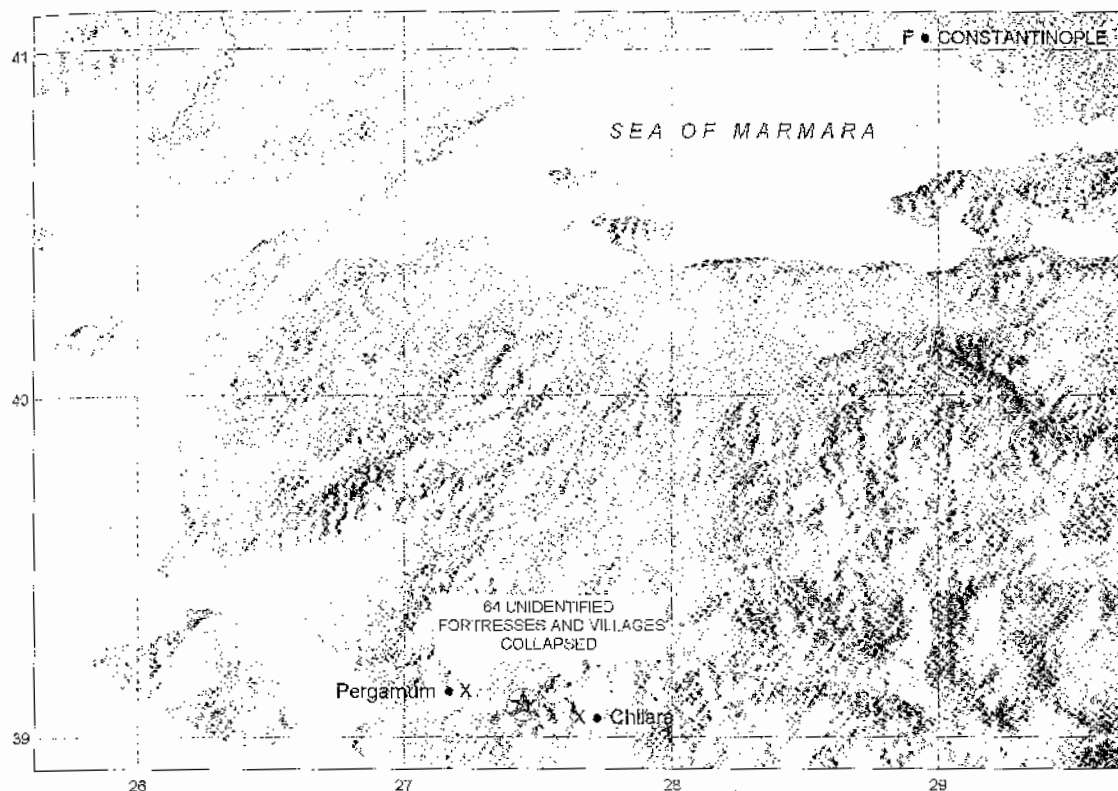
Palaeologus, as we have seen in Gregoras; but it does not in fact seem to have been damaged until the earthquake of 6 November 1344. Parallels with Gregoras suggest that this is a reworking of what he had written, or at least of a source common to both. Schmidt (1881, p.157) suggested the date 1323 and was followed in this by Downey (1955, p.600); Ergin *et al.* (1967, p.17, no.162) seem to be following this tradition when they propose a dating to 1322; Grumel (1958, p.481), had suggested "1323 ou début 1324", because the earthquake is mentioned after the nomination of the patriarch Isaias, or at any rate before the abdication of the Emperor Andronicus II Palaeologus (11 December 1282 – 24 May 1328). This brings to mind the earthquake of 12 May 1327, as recorded in what is known as *Reichschronik 8*. In actual fact, Pseudo-Sphrantzes is applying normal chronological techniques by inserting the record of an earthquake in a sort of "thematic" section, between a paragraph on the patriarchs of the age of Andronicus II and another on innovations in the military sphere. The expression ἐν ἐκείνῳ τῷ χρόνῳ may therefore theoretically refer not so much to the period between 1323 and 1328, as to any point during the reign of Andronicus II. However, since the earthquake of 1296 was, as we have seen, described as the "great earthquake", and since Pseudo-Sphrantzes refers solely to this earthquake as being worthy of note, we think it appropriate to modify the dating proposed by Grumel (1958, p.481) on the basis of this evidence. It is always possible, however, that Pseudo-Sphrantzes confused the "great earthquake" of 1296 with the equally "great" earthquake recorded in *Reichschronik 8*, and that what he gives us is a sort of vague record of both events. The *Notula* in ms. Athos Vatopedi 290 was published by Lampros (1910, no.39) with the incorrect date 1 June 1266. This was taken up by Grumel (1958, p.481), who records an earthquake at that date, as well as by Ducellier (1980, p.106), who in addition omits to give the month. Galanopoulos (1961, p.8; 1955, p.19; 1981, p.693) dates the earthquake to 1-9 June 1366.

▲				
1296 06 01	20:00	UT		
localities	lat.	long.	I	
Istanbul	41 02	28 57	VII-VIII	
1296 06 13	11:30	UT		
localities	lat.	long.	I	
Istanbul	41 02	28 57	V?	

< 151 > **1296 July 17 Pergamum [western Turkey]**
 > fissures, appearance of springs <

- sources** Pachym., *Relat. hist.*, 9.15, III, p.259; *Notula* in Mercati and Franchi de' Cavalieri (1923, p.226) and in Turyn (1964, pp.91-2)
- historiography** Müller-Wiener (1977); Ducellier (1980); Rheidt (1986, 1996)
- literature** Ambraseys and Jackson (1998)
- catalogues d.** Schmidt (1881); Downey (1955); Galanopoulos (1955); Grumel (1958); Galanopoulos (1961); *Galanopoulos (1981); Ambraseys and Finkel (1991); Evangelatou-Notara (1993); *Papazachos and Papazachou (1997)
- catalogue p.** Ergin *et al.* (1967)

On 17 July 1296, a strong earthquake struck the Neocastra area (western Turkey). It had destructive effects in 64 fortresses and villages, including Pergamum (present-day Bergama) and Chliara, where the fortress was completely destroyed and many churches and countless houses collapsed. The shock spread eastwards across the Anatolian plateau. In many places, which are not explicitly identified in the sources, the earth



1296
July 17

fig. 66

split open, while in some new springs gushed forth. There was a high death toll. Information about this earthquake is to be found in Pachymeres, a contemporary Byzantine historian, as well as in a Byzantine *Notula*. Archaeological research at Pergamum has identified traces of late 13th century collapses, which may be attributable to the effects of this earthquake (Rheidt 1996). After recording the earthquake of 1 June 1296 (see the preceding entry), Pachymeres goes on to mention another on 17 July of the same year: "So this one [the earthquake of 1 June 1296], too, lasted for many days, and was felt for a good part of the day and night, as though parts of the spirit had been left behind, and it continued until 17 *Anthesterion* [an archaism for July], with less strength [in Constantinople], whereas in the East it was more powerful and tremendous than it had been before. The disaster then left the territory of Pergamum, and passed through Chliara until it reached Persia itself. Everywhere the ground split open and in some places water spouted forth, while even the foundations of the fortress of Chliara were reduced to ruins, and both churches and the most famous houses collapsed. [...]"

οὕτω γὰρ καὶ τοῦτον ἐφ' ἡμέραις πλείσταις ἐπισημαίνειν καὶ πλειστάκις τῆς ἡμέρας ἢ καὶ νυκτὸς προφαίνειν κατὰ μικρὸν τὰ τοῦ πνεύματος ἐγκαταλείμματα, ὥστε καὶ ἀνθεστηριῶνος ἐπτακαδεκάτῃ ἐνταῦθα μὲν πλείω μὲν τὸ τοῦ χρόνου μῆκος γενέσθαι, μαλακώτερον δὲ τῆ δυνάμει, ἐν δὲ τῇ ἀνατολῇ καὶ μείζω τοῦ φθάσαντος καὶ δεινότερον. Ἐνέσκεψε δὲ τὸ δεινὸν τότε ἀπὸ τῶν περὶ Πέργαμον διὰ Χλιαρῶν μέσων καὶ ἐς αὐτῆς Περσίδος μέρη, ὡς διαστήναι μὲν πολλαχοῦ τὴν γῆν, ἐκβλύσαι δ' ἐνταχοῦ καὶ ὕδατα, ἀνατραπῆναι δὲ καὶ τὰ τοῦ κατὰ τὰ Χλιαρὰ φρουρίου θεμέλια, καὶ ναοὺς καὶ οἴκους τῶν περιπύστων καταπεσεῖν. [...].

Pachymeres goes on to deal further with the effects of the earthquake of 1 June 1296 in Constantinople. After recording the earthquake at Constantinople on 1 June 1296 and stating that the shocks persisted for the next two months, the *Notula* in manuscript *Vaticanus Graecus* 191, fol.319v. (published in Mercati and de' Cavalieri 1923, p.226 and

in Turyn 1964, pp.91-2), goes on to say that:

"[...] on 17 July in the same [ninth] indiction [1 September 1295 – 31 August 1296], at the first hour of the night, there was an earthquake, which was felt less strongly at Constantinople and more powerfully in the East. Sixty-four fortresses and villages were reduced to ruins at that time, including Chliara and Pergamum, and many churches and countless houses collapsed; and there were a great many victims".

[...] κατά δὲ τὴν ιζ' τοῦ ἰουλίου τῆς αὐτῆς ἰνδικτιῶνος ὥρα πρώτη τῆς νυκτὸς σεισμὸς γέγονεν ἐν τῇ Κωνσταντίνου μὲν ἀμβλύτερος, ἐν δὲ ἀνατολῇ σφοδρότατος· ὅτε καὶ κατέπεσον φρούρια καὶ πόλεις ξδ', μεθ' ὧν τὰ Χλιαρὰ καὶ ἡ Πέργαμος· ναοὶ δὲ πολλοὶ καὶ οἰκίαι ἀναρίθμητοι. πλεῖστοι δὲ καὶ ἄνθρωποι ἐφονεύθησαν.

Archaeological research carried out at Pergamum since 1973 by the German Archaeological Institute has identified evidence of collapses which it has been possible to date to the late 13th century, thanks to the discovery of numerous coins (Rheidt 1996, p.95). The considerable damage, which had already been identified in investigations going back to the early years of this century but without a confident dating being possible, has therefore suggested an attribution to the 1296 earthquake.

▲	1296 07 17	18:15 UT	☉ = 39 06 27 27	Io = X	Me = 6.3	Sites: 3	
localities	lat.	long.	I	localities	lat.	long.	I
Bergama	39 08	27 10	X	Istanbul	41 02	28 57	F
Chliara	39 03	27 43	X				

< 152 > 1298 November 30 Rieti area [Latium, central Italy]

< 153 > 1298 December 1 Rieti area

sources 1 Letter from the bishop of Fiesole, Foligno 21 marzo 1301, in Sansi (1879, p.130, note 2); Guid. Spiap., *Cron.*, p.431; Pipino, *Chron.*, col.742; Tol. Lucca, *Ann.*, p.234; Tol. Lucca, *Hist.*, col.1219; Gui Bern., *Liber*, pp.469-70; Will.Nang., *Chron.*, p.695; Sifrid. Balnh., *Comp.*, p.714

sources 2 *Ann. Rotomag. Cont.*, p.504; *Flores hist.*, p.493; *Contin. Anglica fr. Minor.*, p.254; Villani G., *Nuova cron.*, II, p.45; *Ann. Wigorn.*, p.472

historiography BCSansepolcro, J.107, Bercordati, *Cron.*; Tarcagnota (1558); Sant'Antonino Pierozzi (1587); Ghirardacci (1596-1657); Riccioli (1669); Sansi (1879-84); Moroni (1840-79)

literature comets: Ho Peng Yoke (1962); Yeomans (1991)

catalogues d. Magnati (1688); Bonito (1691); von Hoff (1840); Pilla (1846); Perrey (1848); Mallet (1853); Mercalli (1883); Taramelli (1896); Baratta (1901); Milne (1911); Gruncl (1958); *Conversini *et al.* (1990); *Boschi *et al.* (1995, 1997, 2000)

catalogues p. Giorgetti and Iaccarino (1971); Carrozzo *et al.* (1973); Postpischl (1985); CPTI (1999)

At the end of November and the beginning of December 1298, the Rieti area was struck by a sequence of strong earthquakes. After sunrise on the morning of 30 November, a earthquake struck Rieti itself, causing severe panic and possibly some collapses. There were many further shocks that same day, and they continued for many more days. The most destructive earthquake, which one source describes as the "fourth", occurred on 1 December 1298. Houses and towers collapsed in Rieti, and the papal palace was damaged. Of the other villages which were seriously affected, the only two named in the sources are Poggio Bustone (a small village about 11 km north of Rieti), where there were 150 victims, and the fortress and fortified village of Vetranola, which was so badly damaged that it had to be completely rebuilt. Vetranola no longer exists, but was then about 25 km north of Rieti, near the present-day commune of Monteleone di Spoleto.

Rieti attracted the special attention of chroniclers, because the papal court was in residence there at the time.

One chronicler of the first half of the 14th century also mentions Spoleto as having been struck by the earthquake, but that town is not mentioned by sources which were closer in time to the event. The earthquake may also have been felt in Rome.

The stricken area had a certain political and strategic importance at the time, because it formed the boundary between the kingdom of Naples and the lands of the Patrimony of St. Peter, as the papal states were then called.

The earthquake is recorded in a number of reliable contemporary sources. The information about Vetranola comes from a letter written to the podestà of Spoleto by the bishop of Fiesole, governor of the Duchy of Spoleto, on 21 March 1301. The letter is quoted in Sansi (1879, p.130, note 2). In it the bishop authorises the rebuilding of Vetranola:

"we think it right to grant authority for rebuilding the village of Vetranura in your district, since it was destroyed and scattered in the earthquake: either on Fava hill, near the site of the said village, or where the stricken village stood in your district before the destruction. Authority is for rebuilding dwellings, houses and whatever serves the purpose of fortifying the village, so that the inhabitants may be more active and safe there [...]."

quod castrum Vetranure vestri districtus tremotu destructum ac etiam dissipatum rehedificandi in colle fabe prope solum castrum predicti vel ubi ante ruinam castrum percussum extiterat in vestro districtu habitationes domos et alia que ad castrum munitionem expediunt, ut ibidem possint inhabitatores actius et securius habitare dignaremur licentiam impartiri [...]

There is some very specific information in the chronicles of Guido de Spiapasto and Francesco Pipino, both of whom were from Italy. The way the earthquake is recorded in these chronicles became characteristic of many later texts which became part of the tradition: attention is concentrated on the town of Rieti, where the pope resided at the time, and so the narrative is largely devoted to the earthquake which caused pope Boniface VIII (1294-1303) to flee from the cathedral to the Dominican convent, and sent the senior prelates hurrying into the surrounding countryside. The most detailed source for the sequence of earthquakes on 30 November and 1 December is the *Cronaca romana* of Guido de Spiapasto, who was a *procuratore* for the commune of Vicenza:

"In the year 1298 since the birth of Our Lord [...] Then on Sunday morning, on the last day of November in that same year, at the hour of mass, there was a very great and terrible earthquake in the Rieti area, which caused the pope, who was ready with the cardinals to sing and celebrate mass in the cathedral, to flee from the church in great fear, and he went on his own towards the convent of the preachers; and the cardinals and all the other prelates and men of the papal court and all the inhabitants left the said town and went into the country because of this fear, and there they remained for a number of days, for many great shocks occurred on that same day.

Then, on the following Monday, the Calends of December [1 December], in the evening, there was another earthquake even greater than this one, and many houses, dwellings and towers collapsed to the ground in the town of Rieti, and many men and women were killed, and the earthquake continued for many days in that town".

Item anno nativitatis domino millesimo CC nonagesimo octavo [...]. Item eodem anno die dominica ultimo mensis novembris mane hora misse apud reate fuit terremotus maximus et terribilis ita quod propter timorem dominus papa jam existens apparatus cum cardinalibus ad cantandum et celebrandum missam in ecclesia majori cum maximo timore fugit de ecclesie et solus tantum fugit ad locorum predicatorum et cardinales et omnes alii prelati atque curiales et omnes de terra recesserunt de civitate predicta et iverunt ad campos propter dictum timorem et tibi steterunt per plures dies

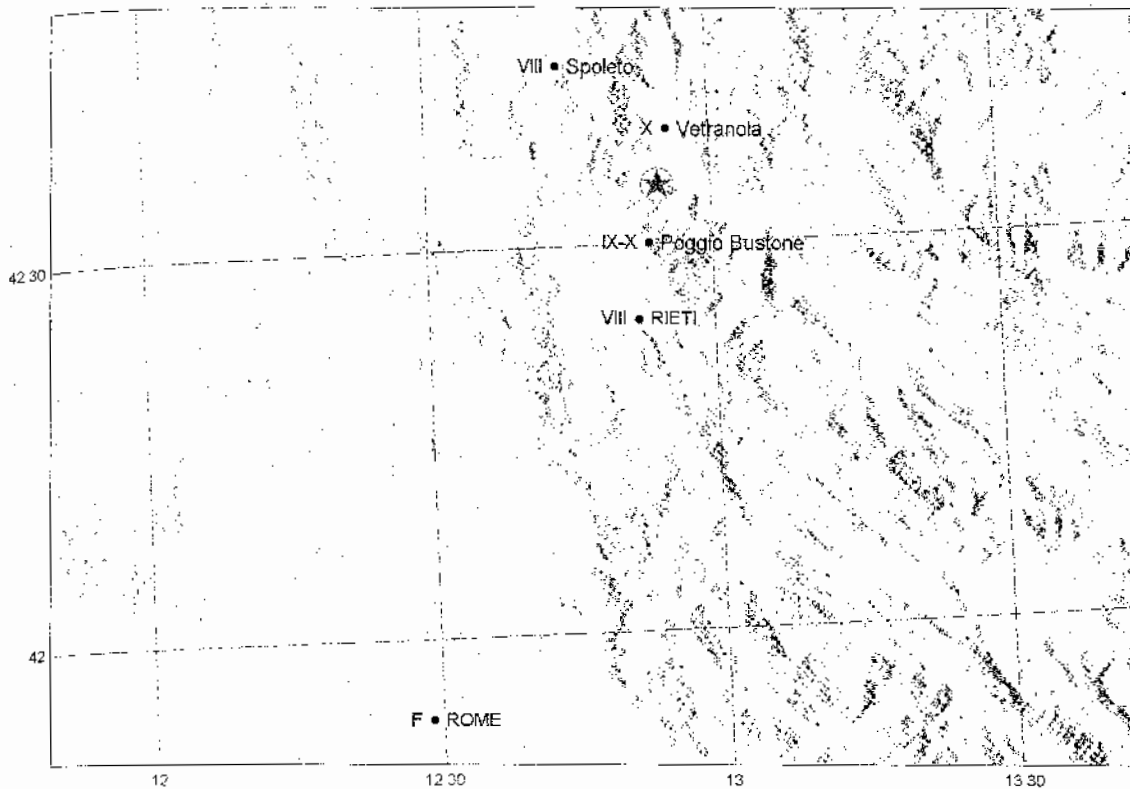
cum multi magni terremotus fuissent eodem die.

Item die lune sequenti die Kalendis decembris in sero fuit alius terremotus adhuc major ita quod multe domus et hospicia t[ur]res ceciderunt et confractae sunt in civitate reatine et quamplures homines et mulieres exinde mortui sunt et fuerunt et per plures dies terremotus in eadem civitate duravit [...].

In the *Chronicon* of Francesco Pipino, who was archivist and deputy prior at the Dominican convent in Bologna, we find the longest description of the earthquake, but unlike the preceding source, it does not clearly distinguish the chronological sequence of shocks:

"In the fourth year of the pontificate of pope Boniface, that is to say the year of Our Lord 1298, the pope and all the cardinals gathered after sunrise to celebrate mass in Rieti cathedral, having put on their pontifical robes. It was the first Sunday in Advent [30 November], when it is the custom of the Roman Church to sing the gospel: 'and there shall be signs in the sun, and in the moon and in the stars, and upon the earth distress of nations'; but they were unaware of any omen of impending disaster, when a great earthquake suddenly struck on all sides, hammering with its blows the whole area of the town and its surrounding territory, so that it seemed about to reduce the whole church to ruins and plunge the town into a deep abyss. Hence the congregation in the church was struck with terror and deathly fear, so that to escape the impending danger they ran here and there to all corners of the church, and clutched at the shaking walls, half dead with fear. Finally, the pope raised his glance on high and stretching his hands heavenwards, he rose from the throne and fled unharmed from the church with the whole congregation. And since to remain in the danger area would have been to tempt God, he descended to lower ground outside the town. But having heard that many large buildings in the town had collapsed, he thought it unwise to spend the night under a roof, and decided to spend the time in an open space. Some cardinals also settled in fields outside the town walls. Finally, when the town had shaken for the fourth time, they fled on foot in dismay, without bothering to have well-dressed servants to lead the way, without waiting for horses, and forgetting to put on their hats. The whole earth trembled: every house was in danger of collapse: every living thing lamented this disaster and every human being fled; the whole town wept; murmuring echoed amongst the populace and there was nothing to be done but recite the *Deus in auditorium* and *Miserere mei Deus*. Poggio Vascone [Poggio Bustone], which lies five miles from the town, was completely destroyed, and its sudden collapse crushed more than 150 people. The earthquake killed many of the citizens and inhabitants of the town of Rieti. It is worthwhile and useful to record this, so that, if something similar were to occur in our time, people should not try to flee, but should rather try to fend off the disaster, and trust in the power of prayer rather than their speed of foot, always bearing in mind the verse of David: 'If I ascend into heaven, thou art there: if I descend into hell, thou art there' [...]."

Huius papae Bonifacii anno IV qui fuit annus Domini MCCXCVIII eodem papa ac universis cardinalibus orto iam sole convenientibus in unum ad Missarum solennia in majori Ecclesia Reatina, dum forent circumamicti Pontificalibus ornamentibus primâ dominicâ de adventu, in qua de more romanae ecclesiae cantatur Evangelium: erunt signa in sole et luna et stellis et in terris pressura gentium nullo turbati temporis imminente praesagio ecce subito magnum immisit undique terraemotum, qui totius civitatis ambitum et terrae centrum concussionis malleo feriens, videbatur ipsam ecclesiam totam in ruinam debere convertere, ac civitatis ipsius abyssum eviscerare profundam. Unde multitudo, quae in Ecclesia convenerat perterrita et stupefacta mortaliter, ut imminentis vitaret periculi sortem, cursitat hic inde per Ecclesiae angulos, et semiviva ad tremulos muros cohaeret, tandem summus Pontifex deorsum erigens oculos, et manus ad coelum attollens de solio surrexit et conversis in fugam pedibus foras cum toto populo exivit illaesus et quia stare sub periculo erat deum tentare, extra civitatem ad



1298
December 1

fig. 67

loca declinavit minora. Sed audito quod multa et magna civitatis aedificia corruerant, sub tecto pernoctare suspectus, sub patentis aetheris spatio trahere moram disponit cardinales quoque nonnulli in campis extra muros civitatis castrametati sunt tandem civitate quarta vice vibrata, reliqui, qui remanserant, attoniti e civitate quarta vibrata, reliqui, qui remanserant, attoniti e civitate fugiunt pedites, non curantes domicellos habere preambulos phaleratos, non expectantes equos, nec capellos rememorantes suis imponi capitibus en tota terra tremuit casa quaelibet ruina minabatur dispendium ululabat omnis caro et omnis homo fugiebat tota plangebatur vicinia; murmur in populo reboabat nihilque demum restabat, nisi Deus in auditorium et Mirerere mei Deus. Podium Vasconis a civitate ipsa quinque milliariibus distans funditus eversum est, et in momento ultra CI. habitatores ipsius hujus ruinae causa oppressit cives et habitatores Reatinae civitatis innumeros sustulit talis occasio. Hoc autem ideo rememoratione dignum est, et perconsequens utile, ut si moderni temporibus simile contingeret, non tendant mortales pestem fugere sed fugare, non de pedum levitate, sed de precum facultate confidant, illud semper Davidicum memoriae retinentes: si ascendere in coelum, tu illic es, si descendero in infernum, ades [...].

The fact that the pope was at Rieti meant that the earthquake would be regularly recorded in papal biographies as well. There is thus a description of the earthquake in the *Liber Pontificalis*, in the life of pope Boniface VIII, written by the French Dominican inquisitor Bernardo Gui:

"In the year of Our Lord 1298, while pope Boniface and his court were residing at Rieti, on the first Sunday in Advent, which was the feast of St. Andrew the Apostle [30 November], a strong earthquake began at Rieti and the surrounding area, such as no human being had ever seen before. It destroyed many buildings in numerous places and lasted for many days and nights, not continuously of course, but repeatedly both by day and night. It made a deep impression on the pope and cardinals and the whole

court. The pope took refuge in the Dominican convent in Rieti, for it was situated in a higher and firmer spot, and there he lay down in the convent garden when a small tent with thin poles had been set up. Then men left at night and fled into the fields, staying out in the open for fear that buildings would collapse on top of them, and they waited in great fear. Here and there men and oxen fell down, for the earth shook and trembled with unusual movements”.

Anno Domini MCCXCVIII Bonifatius papa cum sua curia Reate residente, dominica prima Adventus Domini, in festo beati Andree apostoli, incepit Reate et vicinis partibus vehemens terre motus qualem et quantum nullus tunc vivens viderat prius. Diruitque multa edificia in pluribus locis, multisque diebus et noctibus perduravit, non quidem continue, sed per plures vices in die pariter et in nocte; timoremque non modicum incussit pape et cardinalibus ac toti curie. Confugitque papa ad claustum Predicatorum Reate, qui in altiori et solidiori loco positi erant; ubi in claustrum prout factum tentoriolo festinanter de subtilibus asscribitur conquevit. Homines vero de nocte ibant et fugiebant ad campos, sub divo manentes, edificia ne super se corruerent formidantes, in timore magno expectantes. Cadebantque passim homines et iumenta, cum terra tremere et motibus nutaret insolitis.

There is a brief reference to the earthquake in the *Annales* of Tolomeo da Lucca: “At that same time [1298], there were very great earthquakes at Rieti, where the papal court was in residence, and it shook the papal palace and caused many of the town’s towers to collapse”.

In eodem tempore fuerunt terremotus permaximi apud Reatem, ubi curia erat, commovitque palatium pape et multas turres civitatis ruere fecit.

This reference is taken up by the continuer of his *Historia ecclesiastica*.

Giovanni Villani (who died in 1348 during the plague) gives Spoleto as well as Rieti as one of the towns struck by the earthquake, and also wrongly dates to that year (1298) an earthquake which actually struck Pistoia (in Tuscany) in 1293 (see the entry concerned). The Rieti earthquake thus became famous through the presence of the pope, and no more than half a century later caused a distortion in the dating of what was considered a less important event, by attracting it to its own date. Thus Villani writes: “Of the great earthquakes which occurred in certain towns in Italy.

In the said year [1298], there were many earthquakes in Italy, especially in the towns of Rieti and Spoleto, and in the town of Pistoia in Tuscany. Many houses, palaces, towers and churches collapsed in these towns [...]”.

De’ grandi tremuoti che furono in certe città d’Italia.

Nel detto anno furono molti tremuoti in Italia, specialmente nella città di Rieti e in quella di Spuleto, e in Toscana nella città di Pistoia, ne le quali cittadini caddono molte case, e palazzi, e torri, e chiese [...].

The earthquake is also recorded in contemporary chronicles from other parts of Europe, thereby demonstrating that the presence of the pope in Rieti gave it a certain celebrity in European culture. The *Compendium historiarum* of Sifridus de Balnhusin (now Gross-Ballhausen, in the district of Erfurt in Thuringia, Germany), was known to Bonito (1691), but escaped the notice of Baratta (1901). It records the earthquake in considerable detail:

“In the same year [1298], before Christmas, a great and amazing earthquake began [...] and spread for three days as far as the town of Rieti, where pope Boniface and the cardinals were then residing, and for three days it spread from Rieti as far as the walls of the city of Rome. The earthquake was so violent that it destroyed many towers and houses in various villages and towns, their collapse causing an unknown number of men and women to be struck and killed. Just as pope Boniface himself was preparing

to celebrate mass at the altar, he was suddenly thrown to the ground by a terrible shaking and noise, while the walls of the church shook and pieces of stone became detached from the walls. Nor is that all. The terrible shaking produced by this event caused the pope to grow faint, and although he was protected by the crowd of cardinals and soldiers, he collapsed into the arms of his priests, and after being taken out of the church with difficulty, fled with everybody else. In that same year, a star had been seen which was said to be a comet".

Eodem anno ante nativitatem Domini magnus terremotus et inauditus cepit fieri [...] et protendebatur per tres dietas usque Reatum civitatem, in qua tunc morabatur papa Bonifacius cum cardinalibus, et de Reatu per tres dietas usque ad muros urbis Rome. Fuit autem tam vehemens ille terremotus, ut in diversis castris et civitatibus multas turres et domos subrueret, quarum ruina quot homines utriusque sexus obruti et perempti fuerint, quis enarrare sufficiat? Ipse denique papa Bonifatius, dum altari divina celebraturus astaret, subito terra horribili motu et stridore concutitur, parietes basilice quatiuntur, lapides collisi ad invicem dissecantur. Quid plura? Papa ex huiusmodi strepitu terribili defecit viribus, et licet vallatus esset turba cardinalium et militum, inter manus ministrorum corruit, vixque eductus de ecclesia, fugam cum ceteris iniit. Hoc anno visa fuerat stella que dicitur cometes.

The comet referred to by Sifridus is almost certainly the one which was actually seen between late January and early March 1299, as William of Nangis records in more detail in his *Chronicon*, and as also appears in Chinese, Korean and Japanese sources (Ho Peng Yoke 1962, p.194; Yeomans 1991, p.400). Brief references to the earthquake appear in the *Chronicon* of William of Nangis, in the continuation of the *Annales Rotomagenses* from the monastery at Rouen (the latter wrongly gives Viterbo instead of Rieti as the temporary seat of the papacy), and in the *Flores historiarum*, a chronicle which has been incorrectly attributed to Matthew of Westminster. On the other hand, there are more substantial and detailed reports in the *Annales de Wigornia* compiled in the monastery at Worcester, perhaps by Nicholas of Norton, who was custodian of the cathedral there, and in the *Continuationes Anglicae fratrum Minorum*, which are a continuation of the chronicle of Martin of Troppau. Since none of the above chronicles add further information to what is provided by sources from Italy, we do not transcribe their text.



1298 11 30

localities	lat.	long.	I
Rieti	42 24	12 52	V-VI

1298 12 01 ★ = 42 34 12 54 I₀ = IX-X Me = 6.2 Sites: 5

localities	lat.	long.	I	localities	lat.	long.	I
Vetranola	42 39	12 55	X	Spoletto	42 44	12 44	VIII
Poggio Bustone	42 30	12 53	IX-X	Rome	41 54	12 29	F
Rieti	42 24	12 52	VIII				

< 154 > 1298 December 1 Egypt

< 155 > 1299 January 8 Egypt

source BNF France, ms. Ar. 6739, al-Jazari, *Jawahir al-Suluk*, fol.280v.
 catalogue d. *Ambraseys et al. (1994)

Between December 1298 and January 1299, Egypt was struck by a strong seismic sequence, consisting of two shocks. The first occurred during the evening of 1 December 1298 and is reported as having been felt in two phases, whereas the second and stronger shock occurred on 8 January 1299. No damage is recorded.

The source for this earthquake is the contemporary Damascene writer al-Jazari (1260-1338). For the first earthquake, he strangely provides the date in the Christian as well as the Muslim calendar, but makes an error of 4 days in the conversion:

"On 24 *Safar* [698 H. = 1 December 1298], which corresponds to 5 December, there was an earthquake in the region of Egypt after the last evening prayers, and it took the form of two earthquakes, lasting as long as it takes to recite five verses of the Koran. And on 3 *Rabi' II* [698 H. = 8 January 1299], there was a more violent earthquake in Egypt than had ever been seen before".

وفي رابع عشرين صفر وهو خامس كانون الاول جاءت زلزلة بعد عشاء الاخرة بديار مصر وظهرت دفعتين يكون بينهما قدر قراءة خمس آيات وفي ثالث ربيع الاخر جاءت أيضا زلزلة بمصر لم يعهد مثلها أعظم من الاولى.

△ There are no elements with which to indicate the parameters.

< 156 > **c.1300 Corinth [Greece]**

source JNUL, Ms. Heb. 4° 616 (Eng. trans. in Bowman 1985)

catalogue n. Evangelatou-Notara (1993)

Around the year 1300, there was an earthquake at Corinth, but at the present state of research, its effects cannot be specified.

The source is a letter in Hebrew, sent to Rome and dealing with the affairs of the Jewish community at Chalcis (Egripos, in Negroponte, the present-day island of Euboea, off eastern Greece). The manuscript is now in the Jewish National and University Library in Jerusalem, having come from the "Collegio Rabbinico" in Livorno. The earthquake is mentioned in passing at a point where the letter provides news of R.Shabbetai ben R.Moses, who had fled from Euboea to Corinth, and made his way to Thebes after the earthquake.

The effects of this earthquake are not specified in the letter, but the fact that R.Shabbetai ben R.Moses left Corinth suggests that the city suffered some damage. The brief passage reads as follows:

"And R.Shabbetai ben R.Moses fled from them [the Chalcis community] and took refuge in Corinth. And there came to pass an earthquake so he went to Thebes, and he died there". [Eng. trans. in Bowman 1985].

ויברח מפניהם רבנא שבתי בן רבנא משה וימלט בקורנטו ויהי רוגו ויבא בתיבץ וימת שם.

△ There are no elements with which to indicate the parameters.

< 157 > **1302 December 13 Constantinople [Turkey]**

doubtful event

source Athan. I, Letter, 37, p.78

historiography. Laurent (1971a); Laiou (1972); Talbot (1975); Ducellier (1980)

Amongst problems affecting the city of Constantinople mentioned by the patriarch Athanasius I in a letter to the Emperor Andronicus II Palaeologus (1282-1328), there is one "disastrous event" which has been interpreted by some scholars as an earthquake. What Athanasius wrote was:

"[...] this city would not have been preserved until now from the 13th of December when that resounding blow occurred, nor even the eastern region from Anea itself as far as Scutari".

[...] οὔτε αὐτὴ ἡ πόλις ἐσώζετο ἕως νῦν ἀπ' αὐτῆς τῆς 13' ης τοῦ Δεκεβρίου, ἠνίκα ὁ τετραγῶς ἐκεῖνος ἐγένετο κτύπος, οὔτε τὰ τῆς Ἀνατολῆς, ἀπ' αὐτῆς τῆς Ἀνέας μέχρι τοῦ Σκουταρίου.

The first editor of the letter, Laiou (1972, p.334), thought it had been written in 1303 or early 1304, since it mentions the forthcoming marriage between Nicephorus Chumnus's daughter and the emperor's son.

Ducellier (1980, p.106) simply gives the year as 1304; Laurent (1971a, app.7) and Talbot (1975, p.345) date the letter to early 1303 and the presumed earthquake to 13 December 1302. The letter has caused some debate amongst scholars. Of more recent writers, Laiou (1972, p.334) and Ducellier (1980, p.106), think the event was an earthquake, whereas Talbot (1975, p.345ff., with bibliography), rejects this hypothesis, since "no natural disaster is recorded at this time". He takes the view that the τετραγῶς κτύπος ("resounding blow") probably refers to an enemy invasion — possibly by the Turks.

But since the points of reference are vague, Talbot's *argumentum ex silentio* does not settle the matter.

Laurent — an expert on Athanasius — writes (1971a, app.7): "There remains the possibility that a visionary monk [i.e. Athanasius] dreamed, on 13 December in one year or another, of a dramatic event in which the whole empire seemed to him to sink beneath the blows of countless enemies".

< 158 > 1303 January 15 Constantinople [north-western Turkey]

< 159 > 1303 January 17 Constantinople

sources 1 Pachym., *Relat. hist.*, 10.34, IV, pp.395, 397; Greg., *Hist.*, 7.1, I, p.215;

Theoct., *Zapiski*, p.32

source 2 Calot., *Op.*, pp.493-4

catalogues c. Bonito (1691); Evangelatou-Notara (1993)

Two earthquakes were felt at Constantinople in January 1303. The first occurred towards morning on 15 January, but was so weak as to be scarcely perceptible. The second occurred two days later, during the morning of 17 January. It was stronger than the previous one, but did not cause any damage.

Information about these earthquakes can be found in the works of the Byzantine historians Pachymeres and Nicephorus Gregoras, and in the biography of Athanasius written by Theoctistus Stoudites, a 14th century Byzantine hagiographer and hymnographer.

Pachymeres relates that the ex-patriarch Athanasius sent a monk named Menas Scoleces (PLP 26241) to the Emperor Andronicus II Palaeologus (1282-1328) with a message from Athanasius, asking him to protect the city from "plague, famine, earthquakes and floods" (ἀπὸ λοιμοῦ, λιμοῦ, σεισμοῦ, καταποντισμοῦ).

The following night, towards morning, there was a weak, barely perceptible shock, which convinced the emperor of the truth of Athanasius' words:

"an earthquake so weak as to be scarcely felt by anyone who was awake, convinced the emperor of the truth of what he had been told. [...] And on the morning of the 17th, there was a stronger earthquake, but not such as to place anything in danger".

σεισμός μαλακός, ἐπὶ τοσοῦτον δήλος ὥστε καὶ γνωσθῆναι μόλις τῷ γρηγοροῦντι. Ἦν οὖν τοῦτο τῷ βασιλεῖ εἰς δόξαν ἀληθείας τῶν λεχθέντων προοίμιον. [...] καὶ τῇ ἐπτακαιδεκάτῃ πρωίας σεισμός προσήραξε κραταιότερος, οὐ μὴν δὲ ὥστε καὶ τι τῶν ἐς κίνδυνον ἐκ τούτου γένεσθαι.

After reporting Athanasius' message, Nicephorus Gregoras adds:

"an earthquake which occurred the next day was interpreted by the emperor as the divine wrath predicted by Athanasius".

τῇ δ' ὑστεραία γενομένου σεισμοῦ τούτου εἶναι, φάναι τὸν βασιλέα, τὴν προειρημένην Ἀθανασίῳ θεομηνίαν.

In the *Life of Athanasius* by Theoctistos Stoudites, the same events are narrated in these terms: Athanasius reveals to the emperor "the terrible wrath of God which was about to descend in the form of an earthquake. And he sent Menas, that master of words, works and virtue, to deliver his message".

δηλοῖ τούτῳ καὶ φρικώδη θεομηνίαν διὰ σεισμοῦ γενήσθαι μέλλουσαν· καὶ μηνύει περὶ τούτου διὰ τοῦ λόγου καὶ πράξιν καὶ ἀρετὴν ὑψηλοῦ ἐκείνου Μηνᾶ.

Theoctistos adds that the predicted earthquake occurred on the day and at the time announced by Athanasius. The 14th century theologian Joseph Calothesos, who wrote another biography of Athanasius, narrates the same episode in the following terms:

"not many days earlier, [Athanasius] sent Menas, a man who excelled in words and virtue, to inform the pious emperor that the terrible wrath of God would descend upon us in the form of an earthquake and the collapse of the great imperial residence in the palace".

τὴν θεομηνίαν τὴν φρικτὴν, τὴν διὰ μεγάλου σεισμοῦ καθ' ἡμῶν ἐσομένην οὐ πρὸ ὀλίγων ἡμερῶν καὶ τὴν ἐν τῷ παλατίῳ τοῦ βασιλείου μεγάλου οἴκου πτώσιν, προσημαίνει τῷ εὐσεβεῖ βασιλεῖ διὰ τοῦ λαμπροῦ κατ' ἄμφω λόγῳ καὶ ἀρετῇ Μηνᾶ ἐκείνῳ.

While the chronology of the earthquake is not a problem, an assessment of its effects requires comment. Pachymeres and Calothesos are not merely not in agreement but actually in total contradiction, for one speaks of a scarcely perceptible shock, while the other tells of a "great earthquake" which even damaged the imperial palace. Perhaps what underlies this contradiction is the different, if not opposed attitude of the two writers to the patriarch Athanasius. Pachymeres is always cold, indeed almost hostile to the patriarch, whereas Calothesos is celebrating one of the most admired personalities of the time. Since other sources do not mention this earthquake, however, we may give credence to Pachymeres and conclude that the shocks on 15 and 17 January were minor ones. Such a conclusion is confirmed by a comparison between the *Life of Athanasius* written by Calothesos and the earlier one by Theoctistos. Calothesos' source is indeed the earlier *Life*, where we find a description which fits well with the information provided by Pachymeres and Gregoras. The "great" earthquake is thus a creation of Calothesos' hagiographic and rhetorical pen. Bonito (1691, p.539) dates this earthquake to 1317.



1303 01 15 at morning

localities	lat.	long.	I
Istanbul	41 02	28 57	III

1303 01 17 at morning

localities	lat.	long.	I
Istanbul	41 02	28 57	IV-V

< 160 > 1303 August 8 Crete island [Greece]
 > tsunami, flooding of the river Nile, landslides <

sources 1 Venetian institutional and administrative documents

ASVe, *Avogaria di comun*, Deliberazioni, *Magnus*, reg.20/3, fol.73r., 13 April 1307; *Cassiere della bolla ducale*, *Grazie*, *Novus Liber*, fol.51r., 27 November 1303; *Commemoriali*, reg.1, fols.37v.-38 [September 1303]; fol.53, 13 June 1304; fol.108 [Candia, 1307]; *Maggior Consiglio*, Deliberazioni, *Magnus et Capricornus*, reg.8, fol.144r., 13 April 1307; Deliberazioni, *Presbiter*, reg.11, fols.327v.-328, 1 April 1315; Deliberazioni, *Clericus Civicus*, reg.13, fol.16v., 3 July 1315; *Senato*, *Misti*, Libro II, fols.42-43, March 1304; reg.16, fols.51v.-53v., 19 August 1333; reg.17, fol.83, 15 February 1336; BMCCorrer, Venice, *Misc. Correr*, LXXXI/2703, I, Candia, fols.481-484, *Exemplum*, Two letter to Pietro Gradenigo and Guido da Canal, Candia 8 August 1303 and 28 August 1303.

Latin and vulgar Italian sources

BNMarcianaVe, *Mss. Lat.*, X, 158, *Mon. hist.*, fol.24; BAVat, *Barb. Lat.*, 2741, *Quaedam Chron.*, fol.33v.; Monaci, *Chron.*, p.163; Riccob. Ferr., *Compil.*, col.254; *Ann. Caesen.*, p.75; *Zibald. Canal*, pp.99-100; *Templ. Tyr. Chron.*, p.315; *Liber XXIV Eccl. Hist.*, col.1224

Arabic sources

[manuscript] Dar al-Kutub al-Misriyya, Cairo, ms. 549 Ma'arif 'amma, al-Nuwayri, *Nihayat*, fols.63r., 64, 65-6 (in Taher 1979, part in Arabic, pp.178-9, 182); ms. 2399 Ta'rikh Taymur, Ibn Bahadur, *Futuh al-nasr*, II, fols.205-6 (in Taher 1979, part in Arabic, pp.178, 182); ms. 559, al-Amri, *Masalik*, XVI, fol.3 (in Taher 1979, part in Arabic, p.178) Abu 'l-Fida, *al-Mukhtasar*, IV, p.50; Ibn al-Dawadari, *Kanz*, IX, pp.110-3; Anon., *Ta'rikh*, pp.126-7; Mufaddal b. Abi 'l-Fada'il, *al-Nahj*, pp.86-90; al-'Ayni, *Tqd*, pp.260-5; al-Maqrizi, *Kitab al-suluk*, I, pp.942-3, 944, 944-5, II, pp.3, 652; al-Maqrizi, *Kitab al-Mawa'iz*, II, p.278; Ibn Taghribirdi, *al-Nujum*, VIII, p.201; al-Suyuti, *Kashf*, p.51

Byzantine sources

Pachym., *Relat. hist.*, 9.11, IV, p.429; *Chron. min. Byz.*, 26.14 in Schreiner (1975, p.203)

inscriptions

RCEA, XII (1944), p.243, nos.5160, 5161, 5162; Ciccarello (1996)

sources 2

BMCCorrer, Venice, *Misc. Correr*, XXXVIII/1916-1938, *Trad. Cron.*, fols.20-24; ms. I, 178, Cornaro, *Hist.*, fols.139-140v.; BNMarcianaVe, *Mss. Lat.*, Z.402, *Cron.*, fol.57v.; *Mss. It.*, VI, 3, Calergi, *Comm.*, fols.145-146v.; BAVat, *Chigiani*, G. VI 177, *Chron. Ital.*, fol.70v.; Sanudo, *Vitae*, cols.595, 772; *Ann. Foroliv.*, p.59; *Cron. Ramp.*, II, p.261; Amadi, *Chron.*, p.239

historiography

Corner (1755); Van Berchem (1891); Gerola (1905-32); Thirict (1954, 1966); Dennis (1973); Mánussacas (1973); Tiepolo (1973)

literature

Critikos (1928); Taher (1979); Guidoboni and Comastri (1997); El-Sayed *et al.* (2000)

catalogues d.

von Hoff (1840); Perrey (1850); Mallet (1853); Sieberg (1932a, 1932b); Plataki (1950); Galanopoulos (1955); Grumel (1958); Ambraseys (1963); *Ben-Menahem (1979); *Galanopoulos (1981); *Maamoun *et al.* (1984); Papazachos *et al.* (1986); Evangelatou-Notara (1993); *Ambraseys *et al.* (1994); Amiran *et al.* (1994); *Papazachos and Papazachou (1997)

catalogues p.

Galanopoulos (1961); Shebalin *et al.* (1974); Poirier and Taher (1980); Comninakis and Papazachos (1982); Papadopoulos and Chalkis (1984); Bektur and Alpay (1988); al-Ilakeem (1988)

catalogues Tv

Ambraseys (1962); Antonopoulos (1980); Soloviev (1990); Soloviev *et al.* (2000)

This earthquake was a very large seismic event in the Mediterranean area, involving in its scenario countries of the period with a variety of languages, cultures and economies. It is referred to in the seismological tradition from the mid-19th century up to the modern catalogues of Evangelatou-Notara (1993) and Ambraseys *et al.* (1994), whose investigation of the earthquake made particular use of Arabic sources — i.e. sources not from the island of Crete — then a Venetian dominion — where the worst damage was suffered. The summary which we set out here is based on the study by Guidoboni and Comastri (1997). In addition to re-examining the sources already known to the literature, they also made use of previously neglected Venetian

documentary sources of an institutional kind, thereby producing a detailed picture of effects in Crete where only general descriptions had previously been available. For a critical discussion of how the seismological tradition has attributed different dates and locations to the earthquake, see Guidoboni and Comastri (1997). On the basis of the distribution of effects given in Ambraseys et al. (1994) and Guidoboni and Comastri (1997), El-Sayed *et al.* (2000) have suggested two seismic sources. There is no support for their hypothesis in the written sources, but it is possible that the shocks were so close together that contemporaries were unable to establish a clear time gap between them.

Effects of the earthquake

The letter to the duke of Candia of 8 August 1303 and contemporary Arabic sources are in perfect agreement as to the date and time of the earthquake: for Arab writers it was dawn on Thursday, the 23rd day of the month of *Dhu 'l-Hijja* in the year 702 of the Hegira, which corresponds to Thursday, 8 August in the Venetian source. It is interesting to note that both sources specify the day of the week. The year 702 of the Hegira ran from 26 August 1302 to 14 August 1303, and 8 August 1303 was indeed a Thursday. Bearing in mind the latitude and the month concerned, dawn must have been about 03:30 UT.

The new information utilised in Guidoboni and Comastri (1997) makes it possible to say that the worst effects of the earthquake were felt in Crete. In the capital, Candia (now Iraklion), collapses involved the city walls, houses, churches, the town hall, the local castle, and the towers at the harbour; and the arsenal was very seriously damaged as well. There were destructive effects in the eastern part of the island at the castles of Malvesin, Belvedere, Monforte, Mirabello, Sitia and Temene; in the western part there was serious damage at the castles of Milopotamo, Retimo, Bicorna and Chissamo. In Egypt, serious damage occurred at Abyar, Damanhur al-Wahsh and Sakha in the Nile Delta; and at Alexandria, part of the city walls collapsed and the famous lighthouse was partially destroyed. A number of minarets collapsed in Cairo, and some mosques suffered very serious damage, including the collapse of perimeter walls. In southern Egypt, houses collapsed at Al-Minya, and there was also serious damage at Qus. In Palestine, the most seriously damaged town was Safad (now Zefat). One side of the citadel and two towers collapsed there; and damage also occurred at Al-Karak and Shawbak (now Ash Shawbak). In Syria, part of the city walls of Hamah collapsed, and there are reports of damage (unspecified) at Antioch, as well as slight damage to the Great Mosque in Damascus. There are reports in general terms of damage at Antalya, on the south coast of present-day Turkey, as well as at Sis. In Greece, many places in the Peloponnese were damaged, especially Koroni and Methoni. The island of Rhodes suffered a great deal of damage. Reports about Cyprus, however, are contradictory. According to an Arabic source many churches collapsed, whereas a Latin source says that there was no damage. A mild shock was felt at Constantinople. It may well be that the shock was slightly felt in the Maghreb area, or that the event's great fame generated an inaccurate tradition of local effects. As regards the Maghreb and Cadiz, which are a very long way from the epicentral area, Ibn al-Dawadari (IX, pp.110-3), a contemporary Arab source, reports that after the earthquake, news arrived from places which had been "reached" by the earthquake (including Marrakech, Tunis and Cadiz), as though they were at the extreme edge of the felt area. His expression is certainly unclear and arouses perplexity because of the great distance involved. It is worth pointing out, however, that he used the same expression with reference to Constantinople, and we know from a different source that a few people felt the shock there. He also reports that news had come from Sicily that the earthquake had "reached" that area too, but its effects there are not given.

On the basis of the contemporary sources it is possible to provide details of earthquake effects at 38 locations, 13 of which are unknown to previous studies.

Environmental effects

There was an enormous tsunami; it struck Crete, the coast of Egypt and part of Palestine, and less serious effects were observed in the Adriatic. Near Al-Minya (in Egypt) the earthquake caused the Nile to burst its banks, and was responsible for some landslides (see below).

Evidence of social and economic effects

In order to understand the considerable impact of this earthquake on the social and economic structure of Crete, we must again keep in mind that institutional sources were concerned solely with public buildings, not minor private ones. Consequently, there are only passing references to the nature of damage to private houses, within accounts of overall damage. Contemporary sources mention victims, but provide no specific figures. We know that the death toll was high, but it is impossible to estimate numbers. The number of those killed in Crete is referred to only in late sources, where the figure 4,000 is given. There were also victims at Alexandria and Cairo, as well as on the island of Rhodes. Economic effects were particularly pronounced in Crete, since that was the area which suffered the most damage. In a letter of 28 August 1303 from the chancery at Candia, substantial financial aid was sought, since tax collection had been badly reduced as a result of the earthquake. The rural populace of Greek origin, now under Venetian rule, took advantage of the public disorder brought about by the earthquake to rebel against the Venetian authorities, and began looting. The revolt was later put down by a military force under Alessio Calergi. The request that building workers and joiners should be sent to Crete to repair the serious earthquake damage was granted fairly rapidly by the Venetian authorities, given the distances involved and the available means of communication. There is in fact a document of September 1303 preserved in the Archivio di Stato in Venice (ASVe, *Commemoriali*, reg.1, fols.37v.-38), in which we find listed the names of 28 building workers and joiners, often accompanied by a son, who were sent from Venice to Candia for a year, in order to carry out restoration work. The economic crisis brought about in Crete by the earthquake lasted for a number of years. Many soldiers and custodians of the island's castles were reduced to abject poverty. There was a considerable fall in income from the sale of fish and bread, to the extent that bakers were exempted from taxes for a year because bakeries had been seriously damaged. In addition, the destruction of warehouses brought trade to a halt, with very serious economic results (BMCCorrer, Venice, *Misc. Correr* LXXXI/2703, 28 August 1303; ASVe, *Commemoriali*, reg.1, fol.108).

There is a hint of the earthquake's economic impact in Cairo in a remark by al-Maqrizi (*Kitab al-suluk*, I, 3, pp.944-5) to the effect that the demand for building materials for reconstruction work caused a tremendous increase in prices.

Administrative reactions and reconstruction work in Crete and Cairo

As we have already pointed out, this seismic disaster had a tremendous impact on public buildings (fortifications, harbours, churches etc.), with the result that it left substantial traces in contemporary documents, from which we can work out the time scale for the reconstruction of public buildings. The Venetian documents give us an idea of the activities involved, lasting for more than fifty years. Set out below is a brief chronological summary.

- 1303 September: a list is drawn up containing the names of 28 building workers and joiners, often accompanied by a son, who were sent from Venice to Candia for a year, and the amount of their wages is indicated. The document does not mention the earthquake explicitly, but simply states that they are going to Crete to carry out rebuilding work (*pro redificatione ipsius terrae*; ASVe, *Commemoriali*, reg.1, fols.37v.-38).

- 1303 November 27: deferred payments for the purchase of a galley (ASVe, *Cassiere della bolla ducale*, Grazie, *Novus Liber*, fol.51r.).

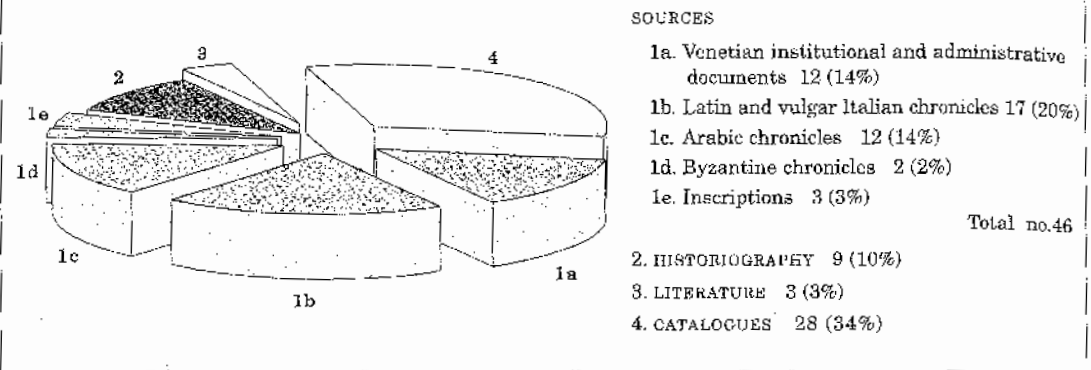


fig. 68

- 1304 March: decision of the Venetian Senate to allocate funds for rebuilding town walls and towers in Crete (ASVe, *Senato*, Misti, Libro II, fols.42-3).
 - 1304 June 13: a letter from the duke of Candia mentions in passing that a lack of men on the island is partly a result of the earthquake (ASVe, *Commemoriali*, reg.1, fol.53).
 - 1307 April 13: decision by the *Maggior Consiglio* to authorise the use of an earlier allocation of 3,000 *hyperpera* to repair damage at Candia to the church of S.Marco, the town hall, buildings inside the arsenal, to rebuild the collapsed walls and towers around the harbour, and to build a castle at Gerapietra (Hierapetra; ASVe, *Maggior Consiglio*, *Deliberazioni, Magnus et Capricornus*, reg.8, fol.144r; copy in *Avogaria de Comun*, *Deliberazioni, Magnus*, reg.20/3, fol.73r). A summary of the document has been published in Thiriet (1966, I, pp.112-3, no.130).

- 1315 April 1: a fresh decision by the *Maggior Consiglio* renewed a previous decision taken on 2 August 1306, urging the duke of Candia to accept responsibility for the cost of rebuilding the church of S.Marco and the island's houses (ASVe, *Maggior Consiglio*, *Deliberazioni*, reg.11, *Presbiter*, fols.327v-328).

- 1315 July 3: a further decision by the *Maggior Consiglio* gave permission for the archbishop and chapter of the church of S.Tito at Candia to import wood from Venice to be used exclusively for the restoration of the church (ASVe, *Maggior Consiglio*, *Deliberazioni, Clericus Civicus*, reg.13, fol.16v).

Documents of later years were found in the *Senato Misti* collection:

- 1333 August 19: the Venetian Senate approved a proposal presented by Giovanni Gradenigo, Marco Giustinian, Nicolò Pesaro and Francesco Dandolo for the reconstruction of the harbour at Candia to the design of *maestro* Francesco delle Barche (ASVe, *Senato*, Misti, reg.16, fols.51v-53v).

- 1336 February 15: the Senate allocated 3,000 *hyperpera* to be used exclusively for the restoration of the castles of Millopotamo, Chissamo and Bicorna, since they were judged to be of primary importance for the defence of the island (ASVe, *Senato*, Misti, reg.17, fol.83).

In Cairo, various emirs saw to the reconstruction of religious buildings: the mosque and minaret of al-Azhar was restored by Sayf al-Din Salar and Shams al-Din Sanqar; the mosque of 'Amr b. al-'As was restored by Sayf al-Din Salar; the mosque and minarets of al-Hakim were restored by Rukn al-Din al-Jashankir, who added the madrasa and altered the building in order to strengthen it; the Salih mosque and its minaret were restored by 'Alam al-Din Sanjar; the minaret and mosque of the Mansuriyya madrasa were restored by Sayf al-Din Kahradash and Shams al-Din Sanqar al-A'sar (al-Nuwayri, XXX, pp.65-6; Ibn al-Dawadari, IX, pp.110-3; Anon., pp.126-7; Mufaddal b. Abi 'l-Fada'il, XX, pp.86-90; al-'Ayni, IV, pp.260-5; al-Maqrizi, *al-suluk*, I, pp.942-3; *al-Khitat*, II, p.278; inscriptions in *RCEA*, XII, nos.5160, 5161, 5162;

1. Venetian administrative documents 10
2. Letters of Venetian Chancellery at Candia 2
3. Manuscript and published chronicles 18

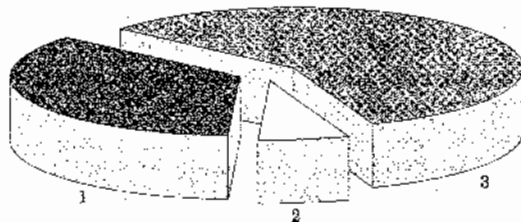


fig. 69

see also Ciccarello 1996). The rebuilding and restoration of the lighthouse, city walls and other buildings at Alexandria was paid for by the Sultan. Repairs to the citadel and towers at Safad were carried out in 1304.

Historical sources: an overall view

The *corpus* of sources consists of four groups: 1) Venetian institutional and administrative sources; 2) Latin and vulgar Italian sources; 3) Arabic sources; 4) Byzantine sources. What made it possible to carry out an in-depth investigation of earthquake effects in Crete was the particular history of the island at the period in question. Since 1211, in fact, Crete had been one of the Mediterranean dominions of the Republic of Venice, and the name Candia was given both to the island as a whole and to its capital, now called Iraklion. At the period when it belonged to Venice, Candia was an island of strategic importance, and the central government of Venice therefore paid a great deal of attention to what went on there (Dennis 1973; Manussacas 1973). Hence the possibility of drawing on the rich financial and administrative documentation concerning the island, now preserved in the Archivio di Stato in Venice.

Documents about Crete are preserved in the Archive of the duke of Candia, who was the supreme local authority. In 1669, his precious archive was transported to Venice by Francesco Morosini — the only archive of a Venetian colony to be preserved after a lapse of so many years. The importance of such documentation lies in the fact that hardly any documents are preserved today in the archives and monasteries of Crete. The number of documents concerning Crete when it was a Venetian dominion is very small: they are in Greek or Italian, and are in Greek or other European libraries, such as those at Mount Athos, Patmos, Paris, Oxford, Harvard, etc. This makes Venice even more important for the study of the history of Crete (Manussacas 1973; Tiepolo 1973). The duke of Candia received communications from the Cretan administration and sent reports to the central government in Venice about any significant events concerning the economy and local government. For the early part of the 14th century, these documents are partly lost and partly preserved as copies in the Library of the Museo Civico Correr in Venice (BMCCorrer, Venice). In addition to documents originating in Crete, it has been possible to track down records and resolutions of the Venetian Senate and Commune, as well as diplomatic documents filed amongst the decisions of the *Commemoriali* in relation to resolutions for post-earthquake action. We therefore widened our research into a number of different archive collections, bringing together as far as possible those administrative files and official reports which revealed the devastating effects of the earthquake and the slow and difficult work of reconstruction.

In addition to institutional and administrative sources, we also made use of a large number of manuscript and published chronicles from Venice and other parts of Italy. And to these records in Italian were added other sources in Arabic and Greek. This body of evidence proved to be reliable as well as of considerable documentary and historical value, and it made a fresh assessment of the earthquake possible.

Venetian institutional and administrative sources

In 1303, the duke of Candia was Guido da Canal, and it was to him that the *Cancelleria Maggiore* of Crete reported its affairs. The *Cancelleria Maggiore* was the local "filter" in relation to the duke of Candia as representative of Venetian power, and its documents proved of the greatest interest in establishing the effects of the earthquake. Our basic knowledge of effects in Crete comes from two long reports. One was written on the day of the earthquake, 8 August 1303, and the other on 28 August in the same year. In the first letter, the *Cancelleria* provides the earliest information about damage to houses and the principal public buildings in the city of Candia, and pleads both for financial assistance and for building workers and joiners to be sent to carry out repair work (BMCCorrer, Venice, *Misc. Correr*, LXXXI/2703).

The second letter, dated 28 August 1303, contains a more detailed survey of damage to the island's castles, and provides further information about damage in the city of Candia. Emphasis is also laid on the serious economic consequences of the earthquake, and it is pointed out that most of the dead (no numbers are given) are women and children (BMCCorrer, Venice, *Misc. Correr*, LXXXI/2703).

Our research was subsequently pursued in a number of different directions: we examined the archive collections preserved in the Archivio di Stato in Venice relating to the *Senato*, the *Commemoriali*, the *Cassiere della bolla ducale*, the decisions of the *Avogaria di comun* and those of the *Maggior Consiglio*. We tried to establish as far as possible the impact of the earthquake on the administration: how far, that is to say, it caused a reaction in the decision-making bodies of the Senate and Commune. The files of the *Commemoriali* office, as the collection of minor diplomatic documents was called from 1291 onwards, provide an almost daily record of current state business, and enabled us to track down various references to the earthquake, especially in connection with reconstruction work. It must be pointed out, however, that the attitude revealed in these institutional sources is a special one, in that the Venetian authorities were only concerned with public buildings, ports, and defence infrastructure such as fortresses and city walls, which guaranteed the commercial and military viability of the island. Set out below is the text of documents which contain descriptions of earthquake effects.

LETTER OF 8 AUGUST 1303 (BMCCorrer, Venice, *Misc. Correr*, LXXXI/2703)

"To the most excellent lord Pietro Gradenigo, celebrated doge etc., to Guido da Canal, duke of Crete, and to his Council etc. The human spirit cannot contemplate nor the language of men express how incomprehensible are the judgements of God and how unexpected his decisions to the human intellect, and what we report with tears and the sobs of mourning is but little amongst our many troubles, and with affliction we bring ourselves by means of this letter to inform Your Lordship of it.

It happened on Thursday the eighth of this month of August, early in the morning, at dawn, (so it pleased God), perhaps because of our sins, that an earthquake struck our island, wrecking all the houses in the city of Candia. It meant that almost all of them were reduced to ruins from their foundations by the unexpected [text missing], and not only the town hall and castle and all the houses of the castle garrison and other inhabitants of the city of Candia, but also all the churches and holy places were damaged, so widespread was the event. And in the evening of that same day of peril, we received from outside the news that all the castles belonging to the commune and to private individuals also suffered in this tragic event, for they were reduced to ruins, and while Heaven willed it that people, both men and women, avoided the danger, a large number of them escaped the peril of collapsing houses only to encounter some other danger, and no words or days are sufficient to tell all the dreadful things that happened. The destruction involved was as great as at Sodom and Gomorrah, and if in this affliction the power of God and your hand do not deign to guarantee to us consolation and assistance, the surviving inhabitants of your city of Candia will be obliged to leave. May it please

you therefore in your authority and compassion to open your eyes in compassion for your city of Candia, and to send, if you will, arms, and financial assistance towards the repair of the city walls, the castles and houses in the commune and your other castles in the island, for their walls and towers completely collapsed, and please also send up to two hundred building workers and joiners, and as much wood as you think appropriate. All this, O merciful God, requires rapid and urgent aid, so that your island shall not succumb to other silent perils because of slow assistance. Your Lordship should also know [*ex tarditate subsidii*] crossed out with a double line] that all the merchants of Venice in Candia avoided the danger of death, except for Bernardo Gradenigo, of whom we have no news. Given at Candia on 8 August, in the first indiction".

Excellentissimo domino eorum domino Pietro Gradonico inclito duci etcetera Guido de Canali ducha Cretae et eius Consilium etcetera. Quantum sint incomprehensibilia iudicia Domini, et inopine huic intellectui sententia sua, spiritus humanus meditare non possit nec lingua hominum exarare, et quod cum lacrimis referimus, et singultibus luctuosis pauca de multis doloribus, et angustiis pungitivis vestra Magnificentia duximus tenore presentium denotanda. Hinc est quod die iouis .VIII. presentis mensis augusti de mane tempestive in aurora (sic Domino placuit), forte peccatis nostris exigentibus taliter, nostra insula imminuit terremotus quod omnes domos civitatis Candida impulit ad ruinam, itaque quasi generaliter usque ad fundamenta ruinam parte sunt in opinam predal[...] quod non solum domus palatium, et castellum communis, et omnes domos militum burgensium et aliorum incolarum civitatis Candida, verum etiam omnes ecclesiae, et loca religiosarum personarum generalitate casus huius sunt sortite. Et unde horam vespertinam eiusdem periculosi diei recipimus nova de foris quod omnia castra communis et aliorum privatarum personarum sunt huiusmodi casus doloris et meroris participes cum omnia tetenderint ad ruinam, et utinam persone, hominum et mulierum, hunc periculum evitassent, sed magnus eorum numerus casu domorum de hoc periculo ad aliud emigravit et cum prolixitas sermonis et dies non sufficiant ad lugubria referenda. Casus hic propter subversionem equipolet casui Sodome et Gomorre u[...] nisi divina potentia et manus vestra dignetur huic merori prestare consolationis et auxilii medicinam, civitas vestra Candide ab illis incolis qui remanserunt cogetur omni mode de relinqui, dignetur igitur misericors potentia vestra vestre civitati Candida misericordia oculos aperiri transmitendo si placet arma, auxilium pecunie pro reparatione murarum civitatis, palatii vestri communis Candide, castelli, domorum communis, et aliorum castrorum vestrorum per insulam existentium quorum muri et turres ceciderunt usque ad fundamenta, et etiam usque ad .CC. viros inter murarios, et marangones, et lignamina in illa quantitate que vobis videbitur convenire. Hec omnia requiruntur misericors Domine succursum celerem et festinum, ne forte insula vestra ex tarditate subsidii succumbat aliis periculis silendis. Preterea noscat magnificentia vestra quod omnes mercatores de Venetiis qui existunt Candide (sicut Domino placuit) mortis periculum evaserunt, preter Bernardum Gradonicum de quo aliquid certitudinis ignoramus. Datum Candide die .VIII. Augusti prima Indictione.

LETTER OF 28 AUGUST 1303 (BMCCorrer, Venice, Misc. Correr, LXXXI/2703)

"To the most excellent lord Pietro Gradenigo, celebrated doge, etc., and to Guido da Canal, duke of Crete, and to his Council etc. We have already written other letters to Your Lordship about the terrible judgement of God which occurred on the eighth day of this present month of August, describing in general terms the earthquake which struck your island of Crete, this city and the castles, but we were not able at that time to supply details, because of the haste with which the letters were despatched and the fact that we did not know the extent of the damage. Now, however, in order that you may in your mercy provide salutary assistance for the great quantity of damage to be repaired, we wish Your Lordship to be aware that our castle of Sitia and its tower, the castle of Monteforte, situated in the same department of Sitia, and its tower, the castle

of Mirabello and its tower, the castle of Belvedere and its various towers, the castle of Temene and its towers, and the castle of Malvicino [Malvesin] and its tower, were all simultaneously destroyed at a single stroke by the earthquake, whereas the castles of Ver[.]scopoli and Bircomier [Bicorna] did not completely collapse, for parts of them remained standing. A tower collapsed at Retimo castle and another at the hamlet of the same castle, and at Chissamo castle collapsed the terrace of the only tower, the repair of which, we calculate, would cost twenty *hyperpera* [text missing] simply to begin work. The church of San Marco, the town hall, the castle and the arsenal all collapsed in ruins, thereby causing great damage to me, the duke, and to the *nobiluomo* Giorgio, counsellor of Crete, as regards our horses and equipment. For the repair of the church, town hall, castle and arsenal, twenty *hyperpera* [text missing] would be enough to begin with. May granting us aid cause you no great displeasure, for we are unable to see to these repairs wholly or in part unless your government takes upon itself to extend a helping hand, for the income of the commune is much diminished. We can receive no income, for example, from the houses in the commune of Ruga Maestra, for they have all been destroyed. Similarly we cannot obtain payment in full from the castles, for many of the soldiers and castellans who run them have been plunged into poverty by the earthquake and their homes have been destroyed. We can receive little from the Venetian community's auctions, or from the *statera*, *platea* and *porta* taxes, and little or nothing from the fish or bread market, because the collapse of houses means that they cannot maintain their usual organisation; indeed we are happy that men should come and sell without paying taxes, and we have exempted bakers for a year, so that they can continue to operate, for the destruction of bakeries meant that there was no bread to be found. There is little or nothing to be had from trade, because outsiders cannot come, for lack of storehouses for their goods, so the sales flow has been interrupted, and without sales the outsiders have stopped coming. Nor can we obtain any dues from local people, for they and others are aware of our weakness and so have not only become boldly disobedient and obstinate, but have even taken to rebellion. So not only those in the western quarters but those in the eastern and central quarters became rebellious and took to looting, and killing men who stood by us [fol.482v. to fol.483v. is an account of the rebellion of the Greeks and the intervention of Alessio Calergi], nor is it possible to hope for help from the soldiers in this, because they have suffered such damage to their towers and the destruction of all their houses, that they are not able to cover the necessary cost and manpower, nor should Your Lordship be surprised that we did not write of these things more swiftly, for we were so busy that we were before by no means in a position to deal with present arrangements, and you should also know that, after the initial danger, which lasted for many hours, the number of men who were killed was not so great as had been thought. Almost all those who died were weak people: not many men, mostly women and children. And since we did not mention the walls of the city before, we now inform your worships that the damage they suffered could be repaired at a cost of five *hyperpera*. Given at Candia on 28 August, in the first indiction".

Excellentissimo domino eorum domino Pietro Gradonico et Guido de Canali duci Cretae et eius Consilium etcetera. Licet per alias literas nostras scripsimus Magnificentie vestre invisum et super immensum Dei iudicium quod accidit die .VIII. presentis augusti per terremotum insula vestra Creta, de civitate et castris vestris quod generaliter scripsimus in eisdem, quia tam distincte et particulariter scribere tunc nequivimus propter festinam missionem earum, ne pote ipsius damni particulariter ignari. Nunc autem, ut tantorum reparatorum damnorum vestrum salubre remedium misericorditer deponatis, Vestram Magnificentiam volumus non latem quod castrum nostrum Sithia cum sua turre, castrum Montis Fortis situm in eiusdem Sithia turma cum sua turre, castrum Mirabelli cum sua turre, castrum Belveder cum pluribus turribus, castrum Temene cum suis turribus, castrum Malvicinum cum sua turre, omnia una, et eadem hora ex toto fuerunt

terremotus conquassatione prostrata, castrum Ver[.]scopoli, et Bircomier non ex toto ruinavi sed particulariter tolerarunt. De castro vero Rethem cecidit una turris et altera de burgo eiusdem castri, et unius turris de castro Chissami cecidit solarium ad quorum reparationum iuxta bonum arbitrium possent sufficere iperpera .XX. stu[.]lito modo pro inceptione reparationis eorum. Ecclesia Beati Marci, Palatium Communis, Castelum et Arsenatus usque ad terram similiter ceciderunt non sine gravi damno mihi Duchae et nobile viro Georgio consiliario Crete in equis et arnesiis nostris. Quorum ecclesia, Palacio, castello, Arsenato reparationi possent sufficere iperpera .XX. pro inceptione [...] ne displicentia maxima expedendi, ad quorum reparationes in toto vel in parte sufficere non valeamus nisi Dominatio vestra manum pongat ad invicem, quoniam redditus communis sunt multimode diminuiti. Nam de domibus communis situs in Ruga Magistra nihil habere possumus, cum omnes generaliter sint prostrate. De castellibus vero non possumus similiter habere plenam solutionem, quoniam multi milites et burgenses conductores eorum propter terremotum sunt ad paupertatem devoluti, et ispa casalia sunt destructa. De incantibus vero communis Veneciarum de statera platea, porta parva, macello, piscatorum et panatarum parvum aut nihil habere possimus cum non possint propter defectur[...] domorum ordine solito substineri, imo sumus contenti quod homines veniant ad vendendum sine ulla solutione et panatarum dimissimus usque ad unum annum cuilibet faciendis eoque, propter ruinam furnorum panis non poterint invenire. De comercho vero parvum aut nihil habere poterit, cum forenses venire non possint, deficientibus domibus in quibus possint recipi sue merces, similiter venditionis interventu cursu et absque hoc forenses desistebant ad veniendum. De dationibus vero villanorum communis aliquid haberi non possit, quoniam tam ipsi, quam alii ceteri villani sentientes defectum nostrum non solum inobedientia et contumacia assumpserunt audaciam, verum etiam ad rebellionis arrogantiam prorumperunt. Itaque tam illi de capite ponentis, quam de capite levantis et de isto medio facti sunt contumaces, et utinam contumacia tantum contenti ad depredationem, et occisionem virorum fidelium. [...] nec potest habere spes quod a militibus in hoc auxilium aliquid habeant, quoniam sunt ita damnificati in suis turribus et casalibus prostratis omnibus quod non sunt sufficientes ad eorum expensas et servitia necessaria facienda nec miretur Magnificentia vestra si hec non scripsimus velocius, quoniam tot sumus negotiis occupati quod prius ordinationi presenti intendere nequivimus ullo modo, insuper sciat quod secundum quod periculum fuit maximum quod tantum duravit per magnam horam non fuerant mortui tot homines quot credebantur, et quasi omnes qui fuerunt mortui, fuerunt impotentes et debiles, pauci viri sed pro maiori parte mulieres et pueri. Et quia de muris civitatis superius non fecimus mentionem significamus Potentie vestre quod tot ceciderunt ex eis quod eorum reparatio iperpera .V. indigetur.

Datum Candida die .XXVIII. augusti prima indictione.

DESPATCH OF SKILLED WORKERS TO CRETE FOR REBUILDING WORK, SEPTEMBER 1303

(ASVe, *Commemoriali*, reg.1, fols.37v.-38)

"In the year of Our Lord 1303, in the second indiction, in the month of September, the undersigned building workers and joiners were sent to Crete to help rebuild that land, and they have to remain there for a year. They have been given half their pay, as is set out below, and the other half of what is due to them shall be paid by the lord duke, and for every day that they work in Crete, they shall receive two grossi and their board". [There follow 28 names of joiners and building workers, often accompanied by a son.]

Anno Domini Millesimo .CCCIII. Indictione secunda mense Setembris, infrascripti muratores et marangones missi fuerunt in Cretam, pro redificatione ipsius terre, et debent ibi esse per unum verum. Eis solutum fuit per medium ut infrascriptum est, et alio medio complere illo et quo est eis solutum, dominus ducha eis solvi facere et omni die quo ipsi laborabunt in Cretam habebunt grossos .II. et viandam ultra soldum; magistri et eorum putei habebunt grossos .I. et viandam.

REPORTS OF REBUILDING WORK AT CANDIA (ASVe, *Maggior Consiglio*, reg.8, fol.144r.; *Avogaria di comun*, reg.20/3, fol.73r.)

"When the duke and counsellors who are now in Crete were given the task of building two fortresses in the eastern capital as quickly as possible [...] and hence it was agreed that [...] they should have at least 3,000 *hyperpera* for that period, both to meet their needs and make a profit from trade, the duke himself and the counsellors arrived in person and spent a great deal of money on essential requirements, that is to say on the church of San Marco in Candia, on the town hall, and on the arsenal, which needed to have internal repairs carried out if it was to be saved, and they had some galleys sent to help rebuild the walls and towers which had collapsed around the port in the earthquake, and for a castle which needed to be built at Hierapetra [...]. It was decided in the presence of the duke that he should be released from any obligation to repay the said 3,000 *hyperpera*, since he was not in a position to do so, and as he was about to depart, he and whoever followed him were instructed to disburse the said sum in accordance with the advice of those who were acquainted with local conditions".

Millesimo CCC^o VII^o mense Aprilis die XIII. Cum fuisset commissum Duche et consiliarios qui nunc sunt in Creta quod cum omni sollicitudine qua possent construi facerent duo castra in capite Levantis [...]. Haberent [...] ad minus yperpera III milia in suo tempore usque ad satisficcionem ipsorum et in ipsis redditus comercli et ipsis Duche et consiliarios super veniret multa facere pro quibus ipsos oportuit expendere silicet pro ecclesia Sancti Marci Candide, pro palacio, pro arsenatu quam oportuit penitu aptari pro salvamento galee sibi missarum pro aptandis muris et turibus existentibus circa portum que propter terremotum ceciderant et pro costruendo castrum in Ierapetra [...].

Capta fuit pars quod presens Duchu absolvatur ab eo quod non potuit reddere dicta yperpera III milia et comittatur Duchu nunc ituro et alii Duchu qui ibit post eum quod solvant dictam pecuniam sicut consulunt illi qui sciunt condiciones dende.

REPORT OF THE DESPATCH OF WOOD FOR REPAIRING THE CHURCH OF S.TITO (ASVe, *Maggior Consiglio*, reg.13, fol.16v.)

"Furthermore, since the church of San Tito in the island of Crete was badly damaged at the time of the earthquake, and since the reverend Archbishop and Chapter of the church wish to repair it, let them send to Venice for wood to the value of twelve *grossi*, duty free, on their assurance that they will not use the wood for any other purpose than the repair of the said church".

Item, quod fiat gratia venerando viro domino Archiepiscopo, et Capitulo Sancti Titi insulae Cretensis quod cum tempore terraemotuum ipsa ecclesia ruinam passa fuerit, et modo dictus dominus Archiepiscopus, et Capitulum ipsam ecclesiam reparare velint, possint conducere, et extrahere de Venetiis tantum lignamen, quod valeat libras .XII. grossorum sine datio, et dando fidanciam, quod nolint illud lignamen pro alio, quam pro dicto laborerio et reparatione dicti loci.

Latin and Vulgar Italian sources

CHRONICLES

As far as private documents are concerned, a number of manuscript chronicles in Venice provide a good deal of information. Some 16th and 18th century manuscripts in the Biblioteca del Museo Civico Correr in Venice were found to contain descriptions of the 1303 earthquake, and were therefore analysed. These were the 18th century *Historia Candiana* by Andrea Cornaro (*Manoscritti* I, 178 [formerly Correr 748, fols.139-140v., of which a number of other copies are in existence], and the 16th or 17th century anonymous *Traduzioni delle Croniche Greche sopra il Regno di Candia* (*Misc. XXXVIII/1922*), which contains an account of affairs in Candia from the earliest times to 1364, including an interpretation of the earthquake in highly religious terms.

In the Biblioteca Nazionale Marciana in Venice (Thiriet 1954), we found a description of the 1303 earthquake which is very similar to that in the above-mentioned *Traduzioni delle Croniche Greche sopra il Regno di Candia*. It occurs in the 17th century *Commentari di Candia* by Antonio Calergi (*Manoscritti Italiani*, VI, 3 [=5999], of which there is another copy in *Manoscritti Italiani*, VI, 155 [=5801]). Very brief descriptions of the 1303 earthquake can also be found in two anonymous manuscripts: the *Cronaca Veneziana dalle origini fino all'elezione di Michele Steno* (*Manoscritti Latini*, Z. 420 [=1734], 15th c.) and the *Monumenta historica, quae ad Cretam insulam se referunt, saeculis XIII-XVI* (*Manoscritti Latini*, X, 158 [=3749]), and in two anonymous chronicles in the Biblioteca Apostolica Vaticana: the *Quaedam Chronica* (*Barberini Latini* 2741 [early 14th c., 16th c. copy]) and the *Chronica Italicarum Rerum* (Chigiano G. VI 177, 17th c.).

Amongst printed works, there is a brief reference to the 1303 earthquake in the *Chronicon* of Lorenzo Monaci, published by Corner in 1758 (see also Corner 1755). Monaci (1351-1428) was a prominent political figure who became Chancellor of Crete in 1388 and was in a position to use original documents, now lost, for his history. That this was a famous earthquake can also be deduced from references in other Italian chronicles, particularly from the Adriatic area, probably because news was gathered at ports where ships from Crete and Venice called in. It is no coincidence that they contain direct references to the tsunami, since the Adriatic was itself affected. An examination of a large number of texts revealed references to the earthquake in the contemporary chronicles of Riccobaldo da Ferrara, the *Annales Caesenates* and the *Liber XXIV Ecclesiasticae Historiae*. The same information was passed down into the next century (see the *Annales Forolivienses* and the Bolognese *Cronaca Rampona* or chronicle of Bartolomeo della Pugliola).

There is a certain amount of information about the effects of the 1303 earthquake in Crete, together with occasional references to Rhodes, Acre (now Akko) and Alexandria, in a brief chronicle to be found in a late 14th century manuscript known as the *Zibaldone da Canal*, in Yale University Library (ed. Stussi 1967). It may be that the report of the earthquake goes directly back to the family of Guido da Canal, who was duke of Candia at the beginning of the 14th century. The same information about the 1303 earthquake as is found in this chronicle also appears in two different passages in the work of Marin Sanudo (1466-1536), a highly respected historian of Venetian affairs. Information about effects in Cyprus and Rhodes is also to be found in the *Chronique* of Templier de Tyr (early 14th century, in vulgar French). It appears in the third part of the collection, known as the *Gestes des Chiprois*. The author, who was close to the entourage of the Order of Templars, narrates events in the Holy Land up to the fall of Acre (1291), and in Cyprus up to 1309. It has been suggested that he was the jurist Gérard de Monréal. His description of the 1303 earthquake derives, as the text specifically points out, from the reports of merchants. Amadi translates the *Chronique* of Templier de Tyr almost word for word, the only difference being that he dates the earthquake to 8 rather than 7 August, and adds information about religious services held on the island after the earthquake. Here is the text of Templier de Tyr:

"When the said year 1303 came, there was a very strong and protracted earthquake on 7 August in the island of Cyprus, the equal of which had never been felt in our times. And though it caused no damage in Cyprus, thanks be to God, at Candia, which is in Crete, and at Rhodes, it did great damage, and there were many victims, and it was felt throughout the world, as merchants have recounted".

Quant vint en ce dit an de M & CCC & III de Crist, à .vij. jours dou mois d'aoust, avint en l'isle de Chipre .j. crole mout grant & mout durable, tel que l'on ne le senty en nostre tens si grant; & quant en Chypre, Dieu mercy, il ne fist nul damage, mais en Candie, quy est en Critfe], & à Rodes, fist mout grant danmage, & morut mout grant gent, & fu sentu par tous les leus dou monde, con les marchans l'ont reconté.

Arabic sources

CHRONICLES

A substantial number of Arabic sources (chronicles and inscriptions) describe the effects of the earthquake, often providing very detailed accounts of damage to public buildings and reconstruction work. The principal contemporary writers were historians and geographers, who may have been able to obtain official information about the effects. During this research, Arabic sources have been directly analysed in the texts of critical editions. The most important sources are works by: Abu 'l-Fida (1273-1331), a Syrian of the family of the Ayyubids; al-Nuwayri (1279-1332), a historian and senior official under the Mamluks, who also compiled an encyclopaedia which is invaluable for the history and geography of his time; Ibn al-Dawadari (13th-14th century), an Egyptian historian who was alive at the time of the earthquake; and Mufaddal b. Abi 'l-Fada'il (14th century), a Coptic historian whose surviving work is a necrological chronicle covering the period of the Bahri Mamluks from 1260 to 1340. The event was also recorded in the next century by other writers, who provide detailed accounts, including particulars not in contemporary sources. One is al-'Ayni (1361-1451), a Turkish historian, much of whose output is in Arabic. He was an intellectual and an official close to the Mamluk sultans, obtaining high office in their service on various occasions. Another is al-Maqrizi (1364-1442), a learned antiquarian born in Cairo, who collected materials of great value for the topographical history of Egypt. He was employed in the civil service, but later retired in order to devote himself to historical and documentary research.

The large earthquake of 1303 continued to be recorded in the 15th century by other writers, such as Ibn Taghribirdi (1409-1470), an Arab historian who was born and died in Cairo, Ibn Bahadur (1432-1473), and al-Suyuti (1445-1505), an Arab polygraph of Persian origin who lived in Baghdad and Egypt (he is famous as a historian of the period of Mamluk influence, and devoted a book to the study of earthquakes).

Research into Arab inscriptions was carried out within the programme of study of large earthquakes in the Mediterranean area from the 11th to the 15th century. With regard to this earthquake, 3 inscriptions record restoration work on some buildings in Cairo. Other inscriptions recording restoration work that may be dated to the first half of the 14th century have not been considered, since the cause of damage is not clearly explained (Ciccarello 1996).

Set out below are the texts of those Arabic sources which provide descriptions of earthquake effects:

Abu 'l-Fida, *Mukhtasar ta'rikh al-bashar*, IV, p.50:

"In this year (702 H.), there was a terrible earthquake which caused the collapse of part of the citadel walls at Hamah and other buildings in the area; it also destroyed many buildings in Egypt, and a number of people perished in the collapse of buildings. Forty-six buttresses (*badana*) collapsed in the city walls at Alexandria".

(فيها) كانت زلزلة عظيمة هدمت بعض أسوار قلعة حامة و غيرها من الأماكن بالبلاد و هدمت بالديار المصرية أماكن كثيرة و هلك خلق كثير تحت الهدم و خربت من أسوار اسكندرية ستا و أربعين بدنة

The exact meaning of the term *badana* is difficult to establish: it refers to a projecting architectural element used as a support, and can sometimes be translated as "pilaster" or "column". For the use of the term, see Van Berchem (1891, p.431 no.2).

al-Nuwayri (Dar al-kutub al-misriyya, Cairo, ms. 549 Ma'arifamma, *Nihayat al-arab*, fol.63r.) records:

"At dawn on Thursday 23 *Dhu 'l-Hijja* in the year 702, a terrible earthquake struck the whole of old and new Cairo, the whole region of Egypt, Damascus, and the whole of Syria, including the coastal and mountain regions. But the worst affected area was the province of Cairo".

وفي يوم الخميس الثالث والعشرين من ذي الحجة سنة اثنين وسبعمائة عند طلوع الشمس حدثت زلزلة عظيمة بالقاهرة ومصر وأعمال الديار المصرية كلها ودمشق والشام أجمع والسواحل والجزال الشامية وكان معظمها بالديار المصرية.

In a later passage al-Nuwayri (*Nihayat al-arab*, fol.64) records:

"[The earthquake] caused massive damage at Alexandria: there was damage to almost the whole of the lighthouse and part of the city walls. The sea complicated the situation: first it withdrew, and then it flooded the arsenal, reaching as far as the city walls. Many people were killed in the flood and the launderers' shops were destroyed".

وأثرت بالاسكندرية أثرا عظيما هدمت أكثر النارة وبعض الاسوار وزجى البحر المالح حال الزلزلة وانطرد عن مكانه ثم مد حتى دخسل الصناعة ووصل إلى الاسوار وغرق جماعة كثيرة عند مده وعوده وعسدم قماش التجار الذي كان عند القصارين بجملته.

In addition, al-Nuwayri (*Nihayat al-arab*, fols.65-6) records:

"Such was the intensity of the earthquake in Egyptian territory that it still appears in the chronicles even now. Faced with these disasters, the government's concern was to rebuild the mosques which had been destroyed. Sayf al-Din Salar, the sultan's representative, was given the task of restoring the mosque of Amr ibn al-'As in old Cairo (*Misr*), while Rukn al-Din Baybars [the future Mamluk sovereign of Egypt, 1309-1310] dealt with the al-Hakim mosque in new Cairo (*Al-Qahira*), renovating its halls and ceilings, decorating the walls afresh, restoring it to its former splendour, assigning to it numerous legacies, and organising study courses and other helpful initiatives. The minaret of the Mansuriyya madrasa was restored using funds bequeathed to the madrasa; the cost of repairing the damaged half of the minaret, from the base to the dome and up to the top was about 90,000 dirhams, just for materials. However, Emir Sayf al-Din Kahrash al-Nasiri managed to make the dome even more beautiful than before. Damage to the mosque [to which the madrasa was attached], on the other hand, was repaired under the direction of Emir Shams al-Din Sanqar al-A'sar. The Salih mosque — the one outside Bab Zuwayla — was also restored, as was the one outside the sultan's gates. All these places and the little mosques which had been destroyed in old and new Cairo were also restored, and everything was made more beautiful than before, thanks be to God".

ولعظم هذه الزلزلة بالديار المصرية أرخ كثير من العوام بها فهم يذكرونها إلى وقتنا هذا. ولما أثرت هذه الزلزلة بالجوامع ما أنسدت اهتم الامراء بالديار المصرية بها فعمر الأمير سيف الدين سلاّر نائب السلطنة ما تشعث بجامع عمرو بن العاص بمصر وعمر ركن الدين بيبرس الجاشنكير أستاذ الدار جامع الحاكم بالقاهرة وجدد موادنه وسقوفه وبيضه وملطه وأصلحه إصلاحا جيدا حتى عاد أحسن ما كان ووقف عليه أوقافا متوفرة ورتب فيه من الدروس ووجوه البر والخير ما تذكره إن شاء الله تعالى في سنة ثلاث وسبعمائة. وأعيدت المأذنة المنصورية من مال الوقف لتصرفه وصرف في عمارتها في نصفها الذي هدم وهو من سطح القبة إلى انتهائها صاعدا ما يتقارب تسعين ألف درهم خارجا عما استعمل من أحجارها المنقوضة منها وعن تفاوت أجر الأسرى وما حمل علي ذوات مرمات الوقف ونذب لعمارتها الأمير سيف الدين كهرداش الناصري وعادت أحسن ما كانت وعمر ما تشعث من الجامع الأمير شمس الدين سنقر الأسمر وعمر الجامع الصالحى الذي هو خارج باب زويلة والجامع الظافرى من الأبواب السلطانية وعمر سائر الأماكن والمساجد التي تهدمت بالقاهرة ومصر حتى عادت أحسن ما كانت والحمد لله تعالى.

al-Nuwayri (*Nihayat al-arab*, fol.66) also records:

"The effects of the earthquake were disastrous at Safad, too: one side of the citadel collapsed. At Acre, the sea flooded the shore, covering the land of Acre as far as the Dayan tower, which stands in the sea — and the distance is considerable. [At Dayan] objects were found which the people of Acre had thrown into the sea during the Muslim siege of the city: some people wanted to retrieve them, but a wave as high as a mountain swept them away and they were drowned. The sea came almost as far as Tall al-Fudul".

وأثرت هذه الزلزلة في صعد أثرا عظيما وسقط جانب من قلعتها وانطرد البحر
بها حتى انكشف ما بين عكا وبرج الديان الذي فسي البحر ومسافته بعيدة وظهر
لبعض من كان بساحلها أشياء مما ألقاه أهل عكا في البحر لما حاصرها المسلمون
فتبادر من كان هناك بالنزول لأخذ ما ظهر لهم فجاء الماء أمثال الجبال فغرقوا ووصل
في مدة إلى قرب تل الفضول.

Here is the text of Ibn al-Dawadari (*Kanz al-durar*, IX, pp.110-113):

"At dawn on Thursday 23 *Dhu 'l-Hijja*, the earth shook at Cairo [*Misr*] as never before; then the earthquake spread throughout the region of Syria and Egypt. The shocks lasted for about a quarter of an astronomical hour [*"rub' sa'at falakiyya"*], with a rumble similar to thunder. The minarets of mosques were destroyed, including the al-Hakim mosque — one of the most seriously damaged; and the minaret of the Mansuriyya madrasa, in new Cairo, between the two palaces [the two palaces are the Qasr al-Bahr and the Qasr al-Dhabab, built by the Fatimid al-'Aziz in 1020], was so severely damaged that it had to be demolished and rebuilt, making it more beautiful than before. Emir Rukn al-Din Baybars saw to the restoration of the al-Hakim mosque, meeting some of the cost out of his own purse. The minaret of the Fakahiyyin mosque, which had been built by the Fatimid al-Zahir, son of al-Hakim, was also destroyed. The minaret and part of the perimeter walls of the Salih mosque, outside Bab Zuwayla, were also damaged. A wall was cracked in the old Cairo mosque, that is to say the mosque of 'Amr b. al-'As, which also suffered a great deal of other damage. Almost all the mosques, large and small, were affected by the earthquake and all were restored. The restoration of the old Cairo mosque was entrusted to Emir Sayf al-Din Salar, as representative of the sultan's government. At Alexandria, the lighthouse was reduced to ruins; a large part of Damanhur al-Wahsh was destroyed, as were also the towns of Abyar and Jazira in Egypt. The Mediterranean flooded the shore at Alexandria, destroying the launderers' shops, and producing dreadful waves. A great many towers were destroyed at Alexandria, and a very large number of people were killed in the ruins. The earthquake also reached Tunis, Sicily, the Maghreb, Cadiz and Marrakush [Marrakech], just touching the territory of the Marinides [a 14th century Moroccan dynasty]. Very few churches remained standing in Cyprus: all this was learned from news which came from those regions after the earthquake. Destruction also occurred at Antioch and its province, as far as Antalya and Sis. The earthquake even reached Constantinople, the sublime city".

لما كان يوم الخميس الثالث والعشرين من شهر ذي الحجة قبل طلوع الشمس
زلزلت الأرض زلزلا شديدا لم يعهد بمصر مثلها من قبل ثم امتدت في جميع البلاد
بالشام ومصر فأقامت تهتز تقدير ربع ساعة فلكية وكان لها دوى كدوى الرعد ثم
إنها هدمت منائر الجوامع منها منارة الجامع الحاكمي وسقطت أكثر جدرانها وخرب
هذا الجامع خرابا شديدا شنيعا لم يكن أثرت في شيء أكثر منه وانشقت المنارة
التي للمدرسة المنصورية بالقاهرة التي بين القصرين إلى أن احتيج بعد ذلك إلى
هدمها وعمرت كأحسن ما يكون واختص بعمارة الجامع الحاكمي الأمير ركن الدين
بيبرس الجاشنكير وأصرف عليه من ماله شيئا كثيرا وعاد كأحسن ما كان وأجد
وانهدمت أيضا منارة جامع الفاكهانيين وهو انشاء الظاهر بن الحاكم الفاطمي وانهدمت
أيضا منارة جامع الصالح بن رزيق الذي ظاهر باب زويلة وبعض جدرانها وتشققت
جدر جامع مصر وهو جامع عمرو بن العاص رضي الله عنه وتشعب فيه شيء كثير
وهدم شيئا كثيرا من منائر الجوامع والمساجد وعمروا بعد ذلك كأحسن ما كان
واختص بعمارة جامع مصر الأمير سيف الدين سalar نائب السلطنة المعظمة. وهدمت
منارة اسكندرية وخربت أكثر دمنهور الوحش بالبحيرة خرابا شنيعا وكذلك مدينة
أبيار بالمنوفية والجزيرة بالديار المصرية وحصل الخراب الشنيع في سائر إقليم
ديار مصر وطلع البحر المالح إلى مدينة ثغر الاسكندرية فغرق كثير من قماش
القصارين وغلال كثيرة كانت على ساحل البحر وهاج البحر هياجا عظيما وهدمت أبراج
كثيرة عدة من الاسكندرية وهلك جماعة عدة من الناس تحت الردم عند حصولها في
أول حال. ووصلت حتى عمت أرض برقة وبلاد تونس من المغرب وصقلية وقادس
ومراكش ووصلت إلى بلاد بني الأحمر المرينيين وعت السواحل وخربت قبرس الأرض

ولم تبق بها كنيسة إلا القليل وذلك جميعه حسبما وردت به الأخبار من جميع هذه النواحي بعد ذلك. وكذلك عمت أنطاكية وأعمالها إلى العلاية وأنطاليية وبعض بلاد سس ووصلت قسطنطينية العظمى.

The anonymous author of *Ta'rikh* (in Zettersteen, *Beiträge*, pp.126-7) records:

"At dawn on Thursday 23 *Dhu l-Hijja*, there was a tremendous earthquake at old and new Cairo and throughout the Egyptian provinces. It was so powerful that it reduced town walls to ruins, split open mountains, reduced buildings to ruins, split open rocks, and opened up springs of water. The earth shook under one's feet, houses swayed about their inhabitants, walls and pilasters cracked, and cries of terror resounded everywhere. Women fled into the streets unveiled, and since people were convinced that the time had come for the death of the living and the resurrection of the dead, they prayed to the God of Heaven. God showed his clemency by halting the earthquake, which would otherwise have obliterated everything on the face of the earth: this was a sign of the benevolence of God towards dwellers on his earth. So writes the humble servant of God, the author of this chronicle. At that time I was on the coast of Minya. At dawn we felt thunder beneath us: it was the earth shaking. I looked towards the mountains in the East, and saw rocks falling to right and left. I looked towards the Nile, and saw the waters part, revealing the river bed, before coming together again. In the city of Minya, the mosque collapsed, as did houses and other buildings".

بمصر والقاهرة وسائر وهو أنه لما كان بتاريخ يوم الخميس الثالث والعشرين من ذي الحجة سنة تاريخه حدثت زلزلة عظيمة بكرة النهار أعمال الديسار المصرية وكانت عظيمة جدا حتى أن الجدر تساقطت والجبال تشققت والمباني تهدمت والصخور تقطعت والمياه تفجرت ومادت الأرض بمن عليه وماجت المساكن بساكنيها وتشققت الأسوار الأركان وثار الصراخ بكل مكان وخرج النساء حاسرات إلى الطرقات وظن الناس أنها إمامة الأحياء وقيامة الأموات وابتهلوا إلى رب السموات لما عراهم من المخافات فأدركتهم رأفته وأنقذتهم رحمته بأن سكن زلزالها لم يبق على وجه الأرض دار ولا بيت به جدار فكان قصر مسافتها وتخفيف أفتها لطفًا من الله تعالى بعباده ومنه على ساكني بلاده. وقال العبد الفقير إلى الله تعالى مؤلف هذا التاريخ وجامعه لما حدث أمر هذه الزلزلة كنت الليلة بايت على ساحل منية ابن خصيب فعند ما بزغت الشمس وإذا بالأرض ترعد من تحتنا وتهتز وأنا أنظر إلى الجبل الشرقي وهو يقطع ويقع يمينا وشمالا ثم نظرت إلى البحر وإذا به انشق نصفين وبان قراره إلى أن تراجع وأما البلد التي هي المنية فإن جامعها وغيرها وقع وكذلك بعض دورهم وأبنيتهم.

Mufaddal b. Abi 'l-Fada'il, *Nahj al-sadid*, XX, pp.86-90 records:

"In this year [702 H.] at dawn on Thursday, the twenty-third day of the month of *Dhu l-Hijja*, the earth shook and there was an earthquake throughout the country of Syria. It was so violent at Safad that two of the citadel's towers collapsed. It extended as far as Egypt, with striking effect: it lasted for about a quarter of an hour, making a noise similar to that of a storm. The minarets at the al-Hakim mosque collapsed, and so did a large part of its walls: it was as badly damaged as it possibly could be. The minaret of the Mansuriyya madrasa was so badly cracked that it had to be demolished and rebuilt; and the same thing happened at the mosque of the Fakkahin, known as "the monument of Caliph al-Zafir" [a Fatimid caliph who reigned from 1149 to 1154], who was one of the caliphs of Egypt. The same thing happened at the Misr mosque [i.e. the mosque of 'Amr b. al-'As in old Cairo], and the Salih mosque, and the worst effects of the earthquake were felt by mosques great and small. These buildings were subsequently restored to their original form, and the work was carried out in the year 704. The lighthouse at Alexandria collapsed, and Damanhur al-Wahsh was very badly damaged, as were also the towns of Abyar and Qus. The disaster reached the whole of Egypt; the sea was whipped up by a terrible storm, and numerous towers collapsed [in the city walls] at Alexandria. He [the historian] has recorded: the earth continued to shake for twenty days, and people shook with terror. It has been said of the earthquake: What troubles your land that

stretches afar, what is the matter, that in broad daylight it is shaken by shocks? All the buildings erected on it have collapsed, and anyone who gazes on the horror of this disaster is overtaken by panic. As regards what has been reported about the earthquake, I have to say that in my opinion, when vapours and gases gather in quantity beneath the earth's surface, if they are not so affected by cold that they turn into water, and are so dense that there is insufficient heat to separate them, should they try to rise up, they fail to find any holes or apertures, because the earth's crust is compact, without holes or porosity, and so the earth's surface is shaken by them and trembles. Similarly, a human body possessed by fever trembles when the fever is high, because the humours which are inevitably imprisoned in the cavities in the various parts of the body are burned there by the powerful fever, and so liquefy, melt and change into vapour and gas. Then they emerge through the pores in the body's skin, and the body continues to be severely agitated and to tremble until those substances have come out, and only then does the body become calm again. The same is true of earthquake shocks in the various lands on earth; what happens is that the earth's surface splits open, and the materials which are imprisoned in the earth come out all at once. But God is wisest about the reality of things".

و فيها في بكرة يوم الخميس الثالث والعشرين من ذي الحجة زلزلت الارض و امتدت في جميع بلاد الشام و كان بصند لها تأثير كبير بحيث وقع برجين من ابرجة القلعة و امتدت الى ديار مصر فأثرت تأثيراً كبيراً واقامت على ذلك تقدير ربع ساعة و كان لها دوي مثل دوي الهوى و هدمت منائر الجامع الحاكمي و وقعت اكثر جدرانها و خرب خراباً شنيعاً و لم تكن أثرت في شئ اكثر منه . و تشقت مأذنة المدرسة النصرية الى ان احتيج الى هدمها و اعادتها و كذلك جامع الفكاكين المعروف بانشاء الخليفة الظاهر احد الخلفاء المصريين و كذلك جامع مصر و جامع الصالح و اكثر ما أثرت في المساجد و الجوامع ثم عمروا كما كانوا و كانت العمارة في سنة اربع و سبعمائة . و هدمت منارة الاسكندرية و خربت دمنهور الوحش خراباً شنيعاً و كذلك مدينة ابيار و مدينة قوص و حصل الخراب في كل ديار المصرية و طلع البحر الجميع تلف بالغرب و هاج البحر هيجان عظيم و هدم هذه ابرجة من الاسكندرية . قال و بقيت الارض ترجف الى مدة عشرين يوماً و الناس خائفين مرجوفين و مما قيل في الزلزلة ما بال أرضكم البسيطة ما لها قد زلزلت عند الضحى زلزالها أهوى لها بنيان كل مشيد و ارتاع ذعراً من رأى أهوالها أقول و مما ذكروه في زلزلة زعموا ان الأبخرة و الأدخنة الكثيرة إذا اجتمعت تحت الأرض و لا يقاومها برودة حتى تصير ماء و تكون مادتها كثيرة لا تقبل التحليل بأذني حرارة و يكون وجه الأرض صلماً لا يكون فيها منفذ و مسام فالبخارات إذا قصدت الصعود لا تجد المسام و امنافذ فتهتز منها بقاع الأرض و تضطرب . كما يرتعد بدن المحموم عند شدة الحمى بسبب رطوبات عنفة احتسبت في خليل أجزاء البدن فتشتمل فيها الحرارة العززية فتذيبها و تحللها و تصيرها بخاراً و دخاناً فتخرج من مسام جلد البدن فيهتز من ذلك البدن و يرتعد و لا يزال كذلك الى ان تخرج تلك المواد فاذا خرجت يسكن . و هكذا حركات بقاع الأرض بالزلازل ربما ينشق ظاهر الأرض و تخرج من الشق تلك المواد المحتسبة دفعة واحدة والله اعلم بحقائق الامور.

Here is the text of al-'Ayni (*Iqd al-juman*, IV, pp.260-5):

"Baybars has recorded as follows in his history: in that year [702], in the early morning of Thursday 23 of the month of *Dhu 'l-Hijja*, there was a terrible earthquake in old and new Cairo and in the other provinces of Egypt, and especially at the port of Alexandria. The earthquake was so intense that walls collapsed, mountains split open, buildings were reduced to ruins, and water burst violently forth from cracks in the ground. The earth violently shook those who were on it, houses swayed around their inhabitants, walls and pilasters cracked and shouts were heard everywhere. Women came out into the streets unveiled, and since people thought the moment of death had come for the living and of resurrection for the dead, they prayed to the Lord of Heaven that what they feared should not take place. Then his pity reached them, and his mercy saved them, for he calmed the earthquake and reduced its terrible power, for if it had lasted for a third of an hour longer, not a single house would have been left on the earth, nor would

a single wall have remained standing. Thus the decrease in the extent of the earthquake and the reduction in the damage it caused was a sign of the grace of God towards his servants and of his mercy on the inhabitants of his earth.

The earthquake affected the Nile and the sea, causing waves in both. They were stirred up with extreme violence and the effects of that were greatest at Alexandria and in western regions; in fact, the towers and walls were largely destroyed in the port, and the earthquake also destroyed a large part of the lighthouse. The sea rose and flooded [the port], the water soaked the launderers' stuffs, sank the sailors' boats, and broke the moorings of the Frankish ships, throwing most of them against the walls and rocks.

When the inhabitants of the port saw with their own eyes that the waves were in a fury, the lighthouse had been destroyed, the town walls and minarets had collapsed, pieces of stone from walls were scattered around, and the massive foundations of buildings were about to collapse, they rushed out in flight to Bab Sidra [the Gate of the Lotus, one of the principal city gates, on the south side]; and when at last God calmed the earthquake shocks and caused the shaking to cease, people returned to their own dwellings and made their way back to their own homes.

News arrived continuously: the said earthquake produced violent effects in western regions and in the islands along the Frankish routes, and the earthquake also took place at the same time on the same day in the lands of Karak and Shawbak and Sawad and in the areas round about.

They say that a merchant who sold fermented milk in the shops of Cairo was in his shop when it collapsed on top of him during the earthquake, so that people thought he was dead; but he remained under the ruins for three days and three nights, and when the earth was cleared away, he was found safe and sound, and was brought out alive and unharmed: for the wood in the building had formed a lattice above him, which bore the weight of the bricks and earth; and what is more, a jug of milk in his shop was undamaged, and he lived on the milk until the rubble was removed.

Part of the Umayyad mosque [in Damascus] collapsed, and rebuilding work was begun later on. People were in a turmoil of fear and fright for days, and moved from one place to another, because they thought the earthquake would start again. This happened in the summer, and after the earthquake came the *simum* [a very hot, dry wind from the desert], which dries up and burns one's face when it blows, but in spite of that, only a few people were killed in Cairo, Egypt and the port of Alexandria.

Nuwayri has recorded: the sea withdrew at Alexandria and then flowed back, destroying huge quantities of merchants' goods and drowning a large mass of people. But when the sea withdrew at Akko, there appeared on the sea bed a large quantity of objects which the people of 'Akka had thrown into the sea during the siege of the city [the city had been recaptured by the Muslims in 1291]. So people rushed to get them back, but the sea returned and drowned every one of them.

The author of the *Nuzha* [Digression] has recounted: we have already mentioned the care devoted to the construction of the new citadel, and how its decoration was a cause of great pride; celebrations began on the fifth day of *Ramadan* and ended in the last ten days of the month, and in spite of the supervision to which they were subjected, honoured women lost their reputation, showing no fear of God, and this went on until the beginning of the month of *Shawwal*, when reprehensible deeds and indecent acts spread amongst the population, and for each tower people began to bring prohibited things, displaying sinful conduct; and in this situation women kept in confinement were compromised, and those amongst honest people who feared dishonour were publicly dishonoured, and so there were no members of illustrious households, notables and others who did not come out of their homes in the company of young slaves, servants or porters, and their minds assumed that anything which amused or excited them was acceptable, to the extent that they rejected decency and took pleasure in shameful acts.

So God made their hearts blind, first by his decree and then by his order, until on Thursday 23 of the month of *Dhu 'l-Hijja*, towards the hour of morning prayer, he sent a terrible earthquake against them: the earth shook to its foundations, walls were felt to shake and rattle, roofs did likewise, and the earth pulled aside anyone who was walking, causing him to leave his path, and it knocked down anyone riding a horse. Then it was said that the sky was closing over the earth, and those who were on foot fled in terror down another alley, only to find there even greater shaking and rattling than in the alley they had just left; young women came out with heads uncovered, without picking up anything to cover themselves in their terror, and the same was true of young girls and children; beggars came out of the mosques and *zawaiya* [the houses of religious confraternities], and many women miscarried. In the sea, the wind whipped up violent waves which broke against one another; and so the sea rose up and crashed down on boats by the shore, carrying them on the wind for an arrow-shot, and then, when the sea returned to its normal state, the boats were left on dry land with broken moorings; and in the same way, the wind pulled boats at sea out of the water and threw them on to dry land. Many dignitaries erected tents in open spaces, bringing out the women of the family and taking them there, and similarly, many people went out towards Bulaq [a small port on the Nile near Cairo], the island of Rawda and other islands. In the morning, the city found itself in such a state that a close look would not have revealed a single house intact, for either a wall had been destroyed, or one side had collapsed, or the whole structure was undermined; the gutters on houses had been broken into pieces, and all that remained was a pile of dust and bricks in front of houses. Then people devoted themselves to deep prayer in all the mosques, great and small, during the day and night of Friday, staying up night and day until Friday prayers to petition the Almighty and implore his mercy. Then news arrived from the western region that a village called Sakha had been completely destroyed, so that not a single wall remained standing, and the whole place had been reduced to a heap of rubble. Much the same had happened to two other villages, and this had also occurred in the eastern district.

On the orders of the sultan, Emir Salar successfully prevented the collapse of the 'Amr mosque in Cairo, and doing so cost him a great deal of money. Emir Rukn al-Din Baybars al-Jashankir undertook the rebuilding of the al-Hakim bi-'amri 'Allah mosque, where a large wall was destroyed and the minaret collapsed. When he surveyed the damage, he said to the architects and superintendents who accompanied him: Consider it your duty to demolish what needs to be demolished, for I have heard say that in one of the supports of this minaret there are many gold coins collected by al-Hakim, who in his wisdom probably wished to make an offering to the mosque in the form of this money for rebuilding work, for he was indeed a provident man. Then the emir suitably rebuilt it, arranged for worshippers to have extra space. He restored and enlarged the minaret, bequeathing advantageous *awqaf* [plural of *waqf*, a charitable bequest] for this purpose, and in addition he assigned to it a teacher, an expert in Islamic traditions and legal alms, muezzin and Koran readers, and experts in law, assigning to them a salary and alms, and setting up a *waqf* which would cover the total cost. When the minaret was demolished, they found in one of the supporting walls the palm of a hand with the wrist, wrapped in cotton, and on it was written a text which no-one could decipher. The palm was soft, but they could not decipher the writing. Emir Sayf al-Din Salar undertook the rebuilding and restoration of the al-Azhar mosque, and also the repair of the minaret and what was left of the façade. He carried out all possible restoration work, reflooring the mosque and painting it white, at very considerable cost; and Shams al-Din Sanqar also shouldered the burden of joining him in the restoration of the al-Azhar mosque.

On the other hand, the Salih mosque, situated outside Bab Zuwayla [one of the gates of Cairo], was rebuilt at public expense, and the task was undertaken by Emir 'Alam al-Din Sanjar. Money for rebuilding the minaret at the Mansuriyya madrasa [built in

Cairo by Malik al-Mansur] was granted to Emir Sayf al-Din Kahruas al-Zarraq, who also spent some *waqf* money on this. Emir Rukn al-Din Baybars was ordered to go to the port of Alexandria to see how much of the lighthouse and other buildings had collapsed, and to carry out any necessary repairs; for the government representative had written to the sultan to say that 46 *badana* [in Mamluk buildings these are pilasters or supports, usually made of brick or stone, and rectangular or square in section] of the lighthouse and 15 *badana* of the city walls had been destroyed, so the sultan ordered that it should all be rebuilt at his expense".

ذكر الزلزلة الكائنة بالبلاد المصرية : قال بيبرس في تاريخه : و فيها في يوم الخميس الثالث والعشرين من ذي الحجة : حدثت زلزلة عظيمة بكرة النهار بقاهرة و مصر و سائر اعمال الديار المصرية ، و خاصة في ثغر الإسكندرية ، و كانت عظيمة حتى ان الجدر تساقطت، و الجبال تشققت، و الصخور تقطعت، و المياه مط خلال الارضين تفجرت، و مادت الأرض بمن عليها، و ماجت امساكن بساكنيها، تشعثت الأسوار و الأركان، و ثار الصراخ بكل مكان، و خرجت النساء حاسرات إلى الطرقات، و ظن الناس أنها إماتة الأحياء و قيامة الأموات، و ابتهلوا إلى رب السموات لما عراهم من المخافات، فأدركتهم رأفته، و أنقذتهم رحمته بأن سكن زلزالها، و خفف أهوالها، و لو دامت ثلث ساعة من النهار لم يبق على الأرض دار و لا ثبت بها جدار، فكان يقصير مسافتها و تخفيف أقتها لطفًا من لله بمعباده، و منة على ساكني بلاده، و أثرت في البحرين العذب و الأجاج، و أثارت فيهما الأمواج، و ارتج كل منهما غاية الإرتجاج، و كان تأثيرها قويا جدا بالإسكندرية و التواحي الغربية، و هدمت بالثغر أكثر الأبراج و الأسوار، و رمت جانبًا وافرًا من المنار، و فاض البحر المالح و طمي، و تعطمط الماء و أغرق قماش امقصارين، و كسر قوارب البحارين ، و قطع مراسي المراكب الفرنجية و طرح أكثرها إلى الأسوار و الشعاب.

و لما عاين اهل الثغر هيجان البحار، و انهدام المنار، و تساقط المآذن و الأسوار و تناثر الأحجار من الجدران، و تداعى الأركان المشيدة البنيان، بادروا مسرعين و خرجوا من باب السدرة هاربين، و اما سكن لله حركتها، و أذهب رجفتها، تراجموا إلى أمكانهم، و عادوا إلى مساكنهم.

و تواترت الأخبار، فإن الزلزلة المذكورة كانت قوية الأثر في البلاد الغربية و الجزائر البحرية، و جهات الفرنجية، و أنها أيضا حدثت في تلك الساعة و ذلك النهار ببلاد الكرك و الشوبك و السواد و تلك الأقطار .

و حكى أن شخصا من الباعة يبيع اللبن في بعض الحوانيت بالقاهرة سقط في الزلزلة حانوته عليه، و ظنه الناس قد مات و أقام ثلاثة أيام و ليالها تحت الردم، ثم نظف التراب و وجد الرجل سالما و أخرج حيا سويا، لأنه تشبكت عليه الأخشاب، و حملت عنه الطوب و الطراب، و سلمت له من حنوته جرة لبن، فكان يقتات منها إلى أن نظف عنه الردم.

و فيها: سقط جانب من قلعة صفد و أسوارها، و برج الباب، عند حدوث هذه الزلزلة، فرممت في السنة القابلة.

و فيها: تهدم جانب من جامع بني امية و أعيد ترميمه، و أقام الناس أياما و هم خائفون و جلون، و من مكان إلى مكان ينتقلون، و امعاودة الزلزلة متوقعون و كان ذلك في الصيف فتوالت بعدها سموم تلفح فتشوى الوجوه حين تنفخ، و لم يمت مع ذلك إلا نفر قليل بالقاهرة و مصر و ثغر الإسكندرية . و قال النويري: و جزر البحر بإسكندرية، ثم رجع فأتلف أموالا عظيمة للتجار، و غرق جماعة كثيرة، و انكشف البحر بساحل عكا، فظهر في قاعه شيء كثير مما ألقاه أهل عكا في مدة حصارها، فتبادر الناس لأخذه، فرجع البحر عليهم فغرقهم عن آخرهم.

و قال صاحب النزهة: قد تقدم ذكر الاهتمام بعمل القلاع و التفاخر في زينتها، و كان ابتداء ذلك خامس رمضان و انتهؤه في العشرة الأخير، و تهتكت الخلائق على التفرج عليها، و لم يخشوا لله تعالى، و استمروا على ذلك إلى [أن] استهل شوال، و مشى فيهم المنكر و الأمور القبيحة، و صار لكل قلعة يحمل إليها من المحرمات، و يتجاهرون بالمعاصي، و تهتكت بسبب ذلك مخدرات النساء، و افتضح من كان يخشى الفضيحة من كل مستور، و لم يبق في المدينة من أكبار البيوت من الأمراء و غيرهم من الأعيان إلا من خرج من بيته مع غلمان أو خدام أو قهرمانات، و كان يرى ما يذله و يروع به عقله ، حتى كان يطرح الحشمة و يستحسن الفضيحة.

و طمس لله على قلوبهم، لقضائه السابق و أمره اللاحق ، حتى أرسل الله عليهم زلزلة

عظيمة يوم الخميس الثالث والعشرين من عي الحجة عند صلاة الصبح، فتزلزلت الأرض بأركانها، و سعت للحيطان قعقعة و رعدة، و كذلك السقوف، و مالت الأرض بالماشي و أخرجته عن طريقه، و أرمت الراكب، و قيل للخلق إن السماء انطبقت على الأرض، و كان الماشي يهرب من الخوف إلى زقاق آخر فيجد فيه من الرعد و القعقعة أكثر مما هرب منه، و عرجت النساء مستبيات حاسرات، فما قدرت من الخوف أن تأخذ شيئا تستتر به، و كذلك البنات و الأطفال، و خرجت الفقراء من المساجد و الزوايا، و أسقطت كثير من النساء الحبال حملها، و ورد على البحر ريح بموج عاصف متلاطم، ففاض البحر فيضا حتى طلع بالمراكب التي على ساحل البحر و حذفهم من البحر مع الريح مقدار رمية نشاب، ثم لما عاد الماء إلى حاله بقيت المراكب على اليبس، فتقطعت مراسها و كذلك مراكب المسافرين اقتلعها الريح من وسط البحر إلى ساحل البر. و قد ضرب كثير من الأمراء خياما في الفضاء و أخرجوا حريمهم إليهم و كعلك خرجت خلق كثير نحو بولاق و الجزيرة و الروضة و غير ذلك، و أصبحت المدينة إذا نظر إليها إنسان لا يجد بيتا صحيحا، إما هدم منه حائط أو وقع من جانبه، أو اشتق بناؤه، و هدمت الأزربة التي على البيوت، و بقيت الأتربة و الطوب أكواما أمام البيوت، و قمتوا في صبح الجمعة و في ليلتها في سائر الجوامع و المساجد، و أقاموا ليلتهم و يومهم إلى حضن صلاة الجمعة واقفين يبتهلون إلى الله تعالى و يتضرعون. ثم جاءت الأخبار من إقليم الغربية أن بعض بلادها و هي تعرف بسخا هدم جميعه حتى لم يبق فيه حائط، فصار كوما، و كذا جرى على قريتين أخريتين و كذا وقع بإقليم الشرقية ثم شرع الأمراء و السلطان في افتقاد الأعمال الضرورية التي لا بد منها و من إصلاحها.

و قد أفلح الأمير سيف الدين ملار نائب السلطنة ما هدم من الجامع العمري بمصر، و أصرف عليه مالا جزيلا. و تصدى الأمير ركن الدين بيبرس الجاشنكير للعمارة جامع الحاكم بأمر الله، و قد كان هدم منه حائط كبير و وقعت مأذنته، و لما نزل إليه و معه المهندسون و المباشرون قال لهم: اجعلوا بالكم في هدم ما يستحق الهدم، فإني سمعت أن في ركن من أركان هذه المأذنة عها كثيرا ادخره الحاكم بأمر الله، و ربما أحاط بحكمته أن يعرض على هذا الجامع عارض من أمر الله يكون ذلك الذهب برسمه و عمارته، فإنه كان رجلا حكيما، ثم إنه عمره كما ينبغي و زاد فيه زيادة واسعة للمصلين، و جدد المأذنة و أمر فيها زيادة، و أوقف عليه أوقافا حسنة، و وضع فيه مدرسا، و حديثا، و صدقا، و مؤذنين، و قراء، و فقهاء، و رتب لهم الرواتب و الصدقات، و أوقف وقفا يكفي ذلك كله، و عند هدم المأذنة وجدوا في ركن منها كفا بزنده منلوقا في قطن، و عليه أسطر مكتوبة لم يعلم أحد ما هي، و الكف طرية، و عجزوا عن قراءة الكتابة. و تصدى الأمير سيف الدين ملار لعمارة الجامع الأزهار و إصلاحه، و إصلاح مأذنته، و إصلاح الواجهة التي وقعت، و جدد فيه جميع أماكنه، و بلطه و بيضه، و أنفق عليه نفقات كثيرة، و كان للأمير شمش الدين سنقر الأعسكر مشاركة له في الجامع الأزهر. و عمر جامع الصالح الذي خارج باب الزويلة من مال بيت المال، و كان الأمير علم امدين سنجر مشده، و أرسدوا لعمارة مأذنة المنصورية للأمير سيف الدين كهرواس الزراق، و أصرف على عمارتها من مال الوقف، و رسم للأمير ركن الدين بيبرس بالسفر لثغر إسكندرية ليكشف ما هدم من المنار و غيره، و أن يرمم جميع ما يحتاج إلى الترميم، و كان نائب إسكندرية كتب إلى السلطان أن الذي هدم المنار ستا و أربعين بدنة، و من السور خمس عشرة بدنة، و رسم السلطان أن يعمر جميع ذلك من مال السلطان.

al-Maqrizi (*Kitab al-suluk*, I, pp.942-3) records:

"In that year there was a terrible earthquake. The reason for this disaster was the wickedness in which people indulged from 5 *Ramadan* [12 April] until the end of *Shawwal* [June]; on the occasion of celebrations for the inauguration of the new citadel: during these days, there was every excess in the consumption of alcohol, and it is impossible to describe the scandalous behaviour involved. On Thursday 23 *Dhu l-Hijja*, at the hour of dawn prayers, the whole earth shook. Walls were felt to creak, ceilings and floors made noises; anyone who was walking staggered, and anyone on a horse fell to the ground. People had the impression that the sky was pressing down on the earth; everybody poured out into the streets, men and women alike, the latter for-

getting to cover their faces in their terror: everything was plunged into chaos and confusion. Houses crumbled, walls split open, the minarets of mosques and madrasas collapsed; pregnant women gave birth prematurely. Then a storm wind blew up. The Nile overflowed its banks, taking boats that lay by the river bank and hurling them into the distance like arrows shot from a bow, and then it flowed back into its bed, leaving them stranded on dry land, with their moorings broken. Then the wind took the boats which were on the river and threw them on to the shore. (Roots were torn out of the ground, rocks split open and springs of water spurted out of the ground. People thought that the hour of Judgement had come, but the clemency of God halted the earthquake: if that had not been so, there would have been no trace of the city left in three hours). People lost a great deal of property; as all fled in panic, they left everything in their homes; thieves took advantage of this and looted as much as they liked. The population poured out of the city; most spent the night outside Bab al-Bahr [one of the city gates], setting up a camp in the suburb of Bulaq as far as the island of Rawda. Not a single house in new Cairo (*Al-Qahira*) was spared; those which did not collapse were badly damaged. All the roof gutters were in pieces, and all that was left of houses was a heap of bricks. Many people spent Friday night in mosques great and small, praying until the next day came. From the west came news that all the houses in the town of Sakha had collapsed: not a wall was left standing, and there were heaps of rubble everywhere. Two villages in the east were also completely destroyed. Then news came from Alexandria: there, the lighthouse had split open and about forty merlons had fallen from the top. The sea had risen up, with waves which reached as far as Bab al-Bahr [one of the gates of Alexandria], pushing the boats of the Frankish merchants on to dry land. The city walls also collapsed on one side, and there were many victims".

وفيهما كانت الزلزلة العظيمة وذلك أنه حصل بالقاهرة في مدة نص التلاع والزينة من الفساد في الحريم وشرب الخمر ما لا يمكن وصفه من خامس شهر رمضان إلى أن قلعت في أواخر شوال. فلما كان يوم الخميس ثالث عشري ذي الحجة عند صلاة الصبح اهتزت الأرض كلها وسمع للحيطان قعقة وللسقف أصوات شديدة وصار الماشي يعيل والراكب يسقط حتى تخيل الناس أن السماء انطبقت على الأرض وخرجوا في الطرقات رجلا ونساء وقد أعجلهم الخوف والفزع عن ستر النساء وجوههن واشتد الصراخ وعظم الضجيج والعيويل وتساقطت الدور وتشققت الجدران وأنهدمت مآذن الجوامع والمدارس ووضع كثير من النساء الحوامل ما في بطونهن وخرجت رياح عاصفة ففاض ماء النيل حتى ألقى الراكب التي كان بالشاطيء قدر رمية سهم وعاد الماء عنها فصارت على اليبس وتقطعت مراسيها واقتلع الريح الراكب السائرة في وسط الماء وحذفها إلى الشاطيء (وحتى أن الجدر تهدمت والصخور تقطعت والبياه من خلال الأرضين تفجرت وظن الناس أنها الساعة قد قامت فلفظ الله بالناس وسكنها فلو دامت ثلاث ساعات لم يبق على الأرض دارا. فقد للناس من الأموال شيء كثير فإنهم لما خرجوا من دورهم فزعين تركوها من غير أن يعوا على شيء مما فيها فدخلها أهل الدعارة وأخذوا ما أحبوا وصار الناس إلى خارج القاهرة وبات أكثرهم خارج باب البحر ونصبوا الخيم من بولاق إلى الروضة ولم تكسد دار بالقاهرة تسلم من الهدم أو تشعث بعضها وسقطت الزروب التي بأعلى الدور ولم تبق دار إلا وعلى بابها التراب والطسوب ونحوه وبات الناس ليلة الجمعة بالجوامع والمساجد يدعون الله إلى وقت صلاة الجمعة. وتواترت الأخبار من الغربية يستوطن جميع دور مدينة سخا حتى لم يبق منها جدار قائم وصار كوما وأن ضيعتين بالشرقية خربتا حتى صارتا كوما. وقدم الخبر من الاسكندرية بأن المنار انشق وسقط من أعلاه نحو الأربعين شرفه وأن البحر هاج وألقى الريح العاصف موجه حتى وصل باب البحر وصعد بالراكب الإفرنجية على البر وسقط جانب من السور وهلك خلق كثير.

In a later passage al-Maqrizi (*Kitab al-suluk*, I, p.944) records:

"From Upper Egypt came news of a dark wind which had arisen that same day, obscuring everything for an hour, and preventing people from seeing one another. Immediately afterwards, the ground had swayed and split open, letting forth white sand in some places and red sand in others. The wind had uncovered the earth, revealing

ancient monuments. The city of Qus was destroyed. A man who was milking a cow was lifted up into the air by the earthquake along with the cow and the pail of milk. When the earthquake subsided, the man found himself a long way away, but not a drop of milk had spilt from the pail. News from Al-Buhayra told that not a single house was left standing at Damanhur al-Wahsh. Of the important buildings destroyed [in Cairo], one was the 'Amr ibn al-'As mosque in old Cairo (Misr); Emir Sallar undertook its reconstruction. Most of the walls of the al-Hakim mosque in new Cairo (Al-Qahira) were destroyed, together with its two minarets; rebuilding work at this mosque was entrusted to Emir Baybars al-Jashankir. The al-Azhar mosque was also destroyed, and Sallar and Emir Sanqar al-A'sar were in charge of rebuilding work. The Salih mosque outside Bab Zuwayla [one of the city gates] was also destroyed, and was rebuilt at the expense of the sultan, under the direction of Emir 'Alam al-Din Sanjar. The minaret of the Mansuriyya madrasa was destroyed, and rebuilding work was carried out using *waqf* funds [funds bequeathed to the madrasa], under the direction of Sayf al-Din Kahradash al-Zarraq. The minaret of the Fakahiyyin mosque also collapsed. Then the damage at Alexandria was dealt with: 46 buttresses and seventeen towers were rebuilt there".

وقد ورد الخبر من الوجه القبلي بأن في اليوم المذكور هبت رياح سوداء مظلمة حتى لم ير أحد أهدأ قدر ساعة ثم ماجت الأرض وتشتقت وظهر من تحته رمل أبيض وفي بعض المواضع رمل أحمر وكشط الريح مواضع من الأرض فظهرت عمائر قد ركبها السافي وخربت مدينة قوص وأن رجلا كان يحلب بقرة فارتفع وقت الزلزلة وبيده الحلب وارتفعت البقرة حتى سكنت الزلزلة ثم انحط إلى مكان من غير أن يتبرد شيء من اللبن الذي في الحلب. وقدم الخبر من البحيرة أن دمنهور الوحش لم يبق بها بيت عامر. وخرّب من المواضع المشهورة جامع عمرو بن العاص بمصر فالتزم الأمير سلاّر النائب بعمارة وخرّب أكثر سوارى الجامع الحاكمى بالقاهرة وسقطت مأذنتاه فالتزم ببيرس الجاشنكير بعمارة وخرّب الجامع الأزهر فالتزم الأمير سلاّر بعمارة أيضا وشاركه فيه الأمير سنقر الأعسر وخرّب جامع الصالح خارج باب زويلة فعمر من الخاص السلطاني وتولى عمارة الأمير علم الدين سنجر وخرّب مأذنة المنصورية فعمرت من الوقف على يد الأمير سيف الدين كهرداش الزراق وسقطت مأذنة جامع الفكاكين وكتب بعمارة ماتهدم بالاسكندرية فوجد قد انهدم من السور ست وأربعمون يدنة وسبعة عشر برجاً فعمرت.

al-Maqrizi (*al-suluk*, I, 3, pp.944-5) subsequently adds:

"News from Safad reported that one side of the citadel had collapsed on the day of the earthquake. At Acre, the sea withdrew about two parasangs [12.8 km], revealing a great many objects and commercial goods on the sea bed. The walls of the Umayyad mosque in Damascus cracked. The shock lasted for five *daraja*, but the earth continued shaking for twenty days. Countless victims were buried in the rubble. It was summer, and after the earthquake, the very hot *samum* wind blew for days. In old and new Cairo people set about rebuilding what had been destroyed: the price of building materials rose to dizzy heights because of the demand. Anyone who saw Cairo would have thought that the enemy had come that way and razed it to the ground. It was a sign to the faithful from God; they abandoned all the excesses of the previous days. Many abandoned sin, for news kept arriving from the lands of the Franks and other places struck by the earthquake".

وقدم البريد من صفد أنه في يوم الزلزلة سقط جانب كبير من قلعة صفد وأن البحر من جهة عكا انحسر قدر فرسخين وانتقل عمن موضع إلى البر فظهر في موضع أشياء كثيرة في قعر البحر من أصناف التجارة وتشتقت جدر جامع بني أمية بدمشق. واستمرت الزلزلة خمس درج إلا أن الأرض أقامت عشرين يوماً ترجف وهلك تحسب السردم خلائق لا تحصى وكان الزمان صيفاً فتوالى بعد ذلك سموم شديدة الحر عدة أيام. واشتغل الناس بالقاهرة ومصر مدة في رم ما تشعث وبني ما هدم وغلت أصناف العمارة لكثرة طلبها فإن القاهرة ومصر صارت بحيث إذا رآها الإنسان يتخيل أن العدو أغار عليها وخرّبها فكان في ذلك لطف من الله بعباده فإنهم رجعوا عن بعض ما كانوا عليه من اللهو والفساد أيام الزينة وفيهم من أقلع عن ذلك لكثرة توارد الأخبار

من بلاد الفرنج وسائر الأقطار بما كان من هذه الزلزلة.

Furthermore, al-Maqrizi, records in another work (*al-Kitab*, II, p.278):

"Almost all the buttresses collapsed; the tops of two minarets were destroyed, and ceilings and walls suffered massive damage. The task of directing restoration work was entrusted to Emir Rukn al-Din Baybars; he went there in the company of the civil authorities and the generals to assess the damage. He gave the order for the work to begin: what had been destroyed was rebuilt, the buttress arches were reinforced, the roof was renewed, and the walls were painted, so that the mosque became as new. The emir settled many legacies on the region of Jiza, Upper Egypt and Alexandria, thereby producing a substantial annual income. Once more the mosque had its courses in jurisprudence, organised according to the four schools, as well as a course in the Sunna; [the emir] also endowed the mosque with a teacher for each course, and many students flocked to them. [...] During restoration work, an extraordinary thing happened. I was told about this in Mecca, in the year 787, by our master Abu 'Abdallah Muhammad Ibn Dargan Shukr al-Muqri', known as al-Mu'ammār, who had been told by someone who observed the reconstruction work on the al-Hakim mosque, that a chest was found in a niche in the minaret facing Bab al-Futuh. The foreman opened it and found inside, wrapped in a piece of cloth, a human hand with some writing on it which no-one could decipher".

سقط كثير من البدنات التي فيه وخرّب أعالي المذنبتين وتشتت سقوفه وجدران فانتدب لذلك الأمير ركن الدين بيبرس الجاشنكير ونزل إليه ومع القضاة والامراء فكشفه بنفسه وأمر برم ما تهدم منه وإعادة مسا سقط من البدنات فأعيدت و في كل بدنة منها طاق وأقام سقوف الجامع وبيخه حتى عاد جديدا وجعل له عدة أوقاف بناحية الجيزة و في الصعيد وفي الاسكندرية تغل كل سنة شيئا كثيرا ورتب فيه دروسا أربعة لإقرار الفقه على مذاهب الائمة الأربعة ودرسا لإقراء الحديث النبوي وجعل لكل درس مدرسا وعدة كثيرة من الطلبة. (...) وجرى في بناء لهذا الجامع أمر يتمجب منه وهو ما حدثني به شيخنا المعروف المسند المعسر أبو عبد الله محمد ابن ضرغان شكر المقرئ بمكة في سنة سبع وثمانين وسبعمائة قال أخبرني من حضر عمارة الأمير بيبرس للجامع الحاكمي عند سقوطه في سنة الزلزلة أنه لما شرع البناء في ترميم ما وهي من المئذنة التي هي من جهة باب الفتوح ظهر لهم صندوق من تضاييف البنيان فأخرجه الموكل بالعمارة وفتحها فإذا فيه قطن ملفوف على كف انسان بزبدة وعليه أسطر مكتوبة لم يدر ما هي.

INSCRIPTIONS

There are three inscriptions recording the rebuilding of a minaret in Cairo which had collapsed in the earthquake. They have been thoroughly studied by Ciccarello (1996).

■ 1 – Madrasa of Qalawun, Cairo. Date 703/1303-1304 (*RCEA*, XII, 1944, p.243, no.5160).

"[In the name of Allah the All-Merciful]. Our lord, the sultan, the victorious king, victorious in the world and in religion, Muhammmad b. Qalawun as-Salihi, ordered [?] the reconstruction [?] of this minaret, at the time of the phenomenon [?] of the earthquake and the collapse [?] of its upper parts, in the months of the year 703 of the prophetic Hegira."

بسملة (Kor. XXIV 36) أمر (؟) بتجديد (؟) هذه المئذنة مولانا السلطان الملك \ ناصر ناصر الدنيا و الدين محمد بن قلاون الصالحى عند ظهور (؟) الزلزلة \ و سقوط أعاليها في شهور سنة ثلاث و سبعمائة من الهجرة النبوية

■ 2 – Madrasa of Qalawun, Cairo. Date 703/1303-1304 (*RCEA*, XII, 1944, p.243, no.5161).

"[In the name of Allah the All-Merciful.] Our lord, the sultan, the victorious king, victorious in the world and in religion, Muhammad b. Qalawun as-Salihi, ordered the reconstruction of this minaret, at the time of the phenomenon of the earthquake and the collapse of its upper parts, in the months of the year 703 of the prophetic Hegira".

بِسْمِ اللَّهِ بِتَجْدِيدِ هَذِهِ الْمَأْذَنَةِ \ مولانا السلطان الملك الناصر ناصر الدنيا \ و الدين
محمد بن قلاوون الصالحى عند ظهور الزلزلة و سقوط \ أعاليها في شهور سنة ثلاث و
سبعمائة من الهجرة النبوية

■ 3 - Madrasa of Qalawun, Cairo. Date 703/1303-1304 (RCEA, XII, 1944, p.243, no.5162).

"[In the name of Allah the All-Merciful]. May God renew his mercy and satisfaction for the soul of the victorious king. May Allah have pity on him. Our lord the sultan, the victorious king, Abu 'l-Fath Muhammad, ordered the reconstruction of this minaret, in the days [of the birth?] of his son. This [was accomplished] at the time of the apparition of the signs that descended from heaven and of the collapse of its upper parts when the earthquake took place, in the months of the year 703 of the prophetic Hegira. Blessing and peace on his administrator".

بِسْمِ اللَّهِ جَدِّدَ الرَّحْمَةَ وَ الرِّضْوَانَ عَلَى رُوحِ الْمَلِكِ الْمَنْصُورِ رَحِمَهُ اللَّهُ \ أمر بتجديد
هاذه المأذنة في أيام ولده مولانا السلطان الملك الناصر أبي الفتح محمد \ و ذلك عند
ظهور الآيات المنزلة و سقوط أعاليها عند حدوث الزلزلة في شهور \ سنة ثلاث و
سبعمائة من الهجرة النبوية على صاحبها الصلوة و السلام

Byzantine sources

CHRONICLES

There is a summary account of the earthquake's effects in Greece and the Aegean by George Pachymeres (1242-c.1310), a Byzantine historian who was born at Nicea and may have died at Constantinople. He wrote a history of the reigns of Michael VIII and Andronicus II, covering the period from 1260 to the summer of 1307. His original and personal narrative is written in difficult archaic Greek, and often presents problems of chronology. Pachymeres's text was introduced into the seismological tradition by Perrey (1850), and has in fact led to some incorrect datings of the 1303 earthquake. Pachymeres records:

"Shortly before that happened [Michael Palaeologus fell ill at Cyzicus], on the eighth of the month of Poseidon [August], there was an earthquake, but many of those present were unaware of it, because there was no forewarning of the shock. But it was clearly felt in the Rhodes area, and those who recall it say that it was the strongest ever. Everything was reduced to ruins at Rhodes, and it was learned that equally terrible things happened at Alexandria. Koroni and Methoni were also damaged in the earthquake, as well as many places in the Peloponnese and in Crete as well".

Ὀλίγον δὲ πρὶν ἢ ταῦτα γενέσθαι, ποσειδεῶνος μηνὸς ὀγδόη, σεισμὸς ἐνοσκήπει, κατὰ μὲν τὰ ἐνταῦθα μέρη ἄγνωστος τοῖς πολλοῖς, ὥστε μηδὲ σημῆναι τὸν κλόνον, κατὰ δὲ τὸ διὰ Ῥόδου κλίμα καὶ πρόσω λαμπρὸς καὶ τῶν πάποτε μνημονευομένων ὁ χαλεπώτατος. Ὅθεν καὶ Ῥόδος μὲν αὐτὴ πᾶσα ἐς τὸ παντελὲς ἀνατέτραπται, ἤκουστο δὲ γε καὶ περὶ Ἀλεξανδρείας καὶ τῶν ἐξ ἴσου ταύτη τὰ πάνδεινα. Κορώνη δὲ καὶ Μεθώνη καὶ τὰ πολλὰ τῆς Πελοποννήσου, οὐκ ἐλάχιστον δὲ μέρος καὶ Κρήτης, σειμοῦ γεγονάσι παρανάλωμα.

There is a Cypriot chronicle, covering the period 1209-1310, which includes a brief reference to earthquake effects in the town of Lefkosia (present-day Nicosia). The text is to be found in codex *Palatinus Graecus* 367, and has been published by Schreiner (1975, no.26, p.203). At fol.172 of this chronicle, we read:

"On 8 August, in the year 6811 [1302-3], there was a great earthquake at the city of Lefkosia".

μηνὶ αὐγούστῳ η', τῆς ωια' ἐγχρονίας, ἡμέρα ε', ὥρα α' τῆς ἡμέρας, γέγονε σεισμὸς μέγας ἐν τῇ πολει Λευκοσία.

Earthquake's effects by locality, based on sources (texts and inscription)
(elaborated from Guidoboni and Comastri 1997)

locality	effects	sources	
Candia (Iraklion)	According to two letters written to the duke of Candia on 8 and 28 August 1303, the earthquake "reduced to ruins" all the houses in the city, collapses being so extensive and serious as to make it appear that they had collapsed "from their foundations". All the houses of the soldiers who garrisoned the fortresses as well as those of other city dwellers were struck, in addition to all the churches and other holy places. The church of S.Marco collapsed, as well as the roof of S.Tito. The town hall collapsed, as did the town castle, the town walls and the towers in the harbour area; and the arsenal was also severely damaged. There were fewer victims than was first thought, those killed being mostly women and children. Late sources put the number of dead at 4,000.	BMCCorrer, Venice, <i>Misc. Corr.</i> , LXXXI/2703, 8 August 1303; 28 August 1303; ASVe, <i>Commemoriali</i> , reg.1, fols.37v.-38; <i>Maggior Consiglio</i> , reg.8, fol.144r.; reg.13, fol.16v.; <i>Avogaria di comun</i> , reg.20/3, fol.73r.	CRETE ISLAND
Belvedere Cast. (Πιζόκαστρο)	The castle and its various towers were "completely destroyed".	BMCCorrer, Venice, <i>Misc. Corr.</i> , LXXXI/2703, 28 August 1303.	
Bicornia Cast. (Αποκορώνι)	Not entirely destroyed: part remained standing. It is also mentioned in a document which allocates three thousand <i>hyperpera</i> for restoration work.	BMCCorrer, Venice, <i>Misc. Corr.</i> , LXXXI/2703, 28 August 1303; ASVc, <i>Senato</i> , Misti, reg.17, fol.83.	
Chissamo Cast. (Κίσομος)	The terrace of the castle's only tower collapsed. Twenty <i>hyperpera</i> were allocated for initial repairs. It is also mentioned in a document which allocates three thousand <i>hyperpera</i> for restoration work.	BMCCorrer, Venice, <i>Misc. Corr.</i> , LXXXI/2703, 28 August 1303; ASVe, <i>Senato</i> , Misti, reg.17, fol.83.	
Malvesin Castle (Μολεβίτζι)	The castle and its tower were "completely destroyed".	BMCCorrer, Venice, <i>Misc. Corr.</i> , LXXXI/2703, 28 August 1303.	
Mirabello Cast. (Μεραμπέλο)	The castle and its tower were "completely destroyed".	BMCCorrer, Venice, <i>Misc. Corr.</i> , LXXXI/2703, 28 August 1303.	
Millopotamo Castle (Μυλοπόταμος)	One of the most seriously damaged. It is mentioned in a document which allocates three thousand <i>hyperpera</i> for restoration work.	ASVe, <i>Senato</i> , Misti, reg.17, fol.83.	
Monforte Castle (Απανοκάστελο)	The castle and its tower, situated within Sitia, were completely destroyed.	BMCCorrer, Venice, <i>Misc. Corr.</i> , LXXXI/2703, 28 August 1303.	
Retimo Castle (Ρέθυμνο)	One tower collapsed, as well as another situated within the castle grounds.	BMCCorrer, Venice, <i>Misc. Corr.</i> , LXXXI/2703, 28 August 1303.	
Sitia Castle (Σητεία)	The castle and its tower were completely destroyed.	BMCCorrer, Venice, <i>Misc. Corr.</i> , LXXXI/2703, 28 August 1303.	
Temene Castle (Τέμενος)	The castle and its towers were completely destroyed.	BMCCorrer, Venice, <i>Misc. Corr.</i> , LXXXI/2703, 28 August 1303.	
<i>Verf. Iscopoli C.</i> (not identified)	Not entirely destroyed: part remained standing.	BMCCorrer, Venice, <i>Misc. Corr.</i> , LXXXI/2703, 28 August 1303.	

- Abyar Largely destroyed. Ibn al-Dawadari, pp.110-3; Mufaddal b. Abi 'l-Fada'il, pp.86-90.
- Alexandria Information about local effects in contemporary and slightly later Arabic sources is substantially similar. The city walls were largely destroyed: 46 buttresses and 17 towers collapsed, but were later rebuilt. The city's famous lighthouse was also partially destroyed, and there was a high death toll. The people of the city were so terrified by the earthquake and tsunami that they fled. Abu 'l-Fida, IV, p.50; al-Nuwayri, XXX, p.64; Ibn al-Dawadari, IX, pp.110-3; Mufaddal b. Abi 'l-Fada'il, XX, pp.86-90; al-'Ayni, IV, pp.260-5; al-Maqrizi, *al-suluk*, I, pp.942-3; Ibn Bahadur, II, p.205; al-'Amri, XVI, p.3; Pachymeres, II, pp.392-3.
- Cairo Some contemporary or slightly later Arab sources make a point of recording damage and restoration work at religious buildings. Amongst later writings, there is al-Maqrizi where most attention is paid to the reconstruction of mosques. The people were panic stricken and fled the city, spending the night of Thursday 8 – Friday 9 August outside one of the city gates between the suburb of Bulaq and the island of Rawda. Thieves took advantage of the situation to loot abandoned dwellings. al-Nuwayri, XXX, pp.63, 65-6; Ibn al-Dawadari, IX, pp.110-3; Anon., *Ta'rikkh*, pp.126-7; Mufaddal b. Abi 'l-Fada'il, XX, pp.86-90; al-Maqrizi, *al-suluk*, I, pp.942-4; *al-Khitat*, II, p.278; al-'Ayni, IV, pp.260-5.
- Damanhur al-Badly damaged. The sources describe very severe effects, including the collapse of houses. Ibn al-Dawadari, IX, pp.110-3; Mufaddal b. Abi 'l-Fada'il, XX, pp.86-90; al-Maqrizi, *al-suluk*, I, p.944.
- Al-Minya An unidentified writer who was at Minya during the earthquakes has left a touching record of what happened when the mosque collapsed, along with houses and other buildings. Anon., *Ta'rikkh*, pp.126-7.
- Qus Devastation was caused here. It is related that a man was thrown into the air, together with the cow he was milking and the milk pail. Mufaddal b. Abi 'l-Fada'il, XX, pp.86-90; al-Maqrizi, *al-suluk*, I, p.944.
- Sakha Houses in the town collapsed, and there were heaps of rubble everywhere. Two (unidentified) villages to the east were completely destroyed. al-'Ayni, IV, pp.260-5; al-Maqrizi, *al-suluk*, I, pp.942-3.
- GREECE
- Koroni Damage occurred. Pachymeres, II, pp.392-3.
- Methoni Damage occurred. Pachymeres, II, pp.392-3.
- Peleponnese Many places were damaged. Pachymeres, II, pp.392-3.
- The island of Rhodes Destruction occurred, and there was a high death toll. Pachymeres, II, pp.392-3; Templ. Tyr, p.315; Amadi, p.239.
- Rhodes (city) The entire city was reduced to ruins. Pachymeres, II, pp.392-3.
- JORDAN
- Al-Karak Suffered damage. al-'Ayni, IV, pp.260-5.
- Ash Shawbak Suffered damage. al-'Ayni, IV, pp.260-5.
- ISRAEL
- Safad One side of the citadel collapsed, as well as two (Zefat) towers. Repairs were carried out the following year. al-Nuwayri, XXX, pp.65-6; Mufaddal b. Abi 'l-Fada'il, XX, pp.86-90; al-'Ayni, IV, pp.260-5; al-Maqrizi, *al-suluk*, I, 3, pp.944-5; Ibn Bahadur, II, p.206.

Damascus	The walls of the Umayyad mosque were damaged. The people remained in fear for a number of days, since they expected aftershocks.	al-'Ayni, IV, pp.260-5; al-Maqrizi, <i>al-suluk</i> , I, p.944; Ibn Babadur, II, p.206.	SYRIA
Hamah	Part of the citadel walls collapsed, as did other buildings in the area.	Abu 'l-Fida, IV, p.50.	
The island	According to news reaching Egypt after the earthquake and recorded by Ibn al-Dawadari few churches remained standing. The <i>Chronique</i> of Templier de Tyr conflicts with this report, however, in stating that while the shock was very strong, it did not cause damage. Francesco Amadi, repeats this information, adding only that many processions were held and it was decided that a bell should be rung three times at sunset.	Ibn al-Dawadari, IX, pp.110-3; Templier de Tyr, p.315; Amadi, p.239.	CYPRUS
Lefkosia (Nicosia)	The shock was strongly felt.	Cypriot Chronicle, in Schreiner 1975, no.26, p.203.	
Antalya	Unspecified damage occurred in the city.	Ibn al-Dawadari, IX, pp.110-3.	TURKEY
Antioch	Unspecified destruction occurred in both the city and its province.	Ibn al-Dawadari, IX, pp.110-3.	
Constantinople (Istanbul)	Few people felt the shock.	Pachymeres, II, pp.392-3; Ibn al-Dawadari, IX, pp.110-3.	
Sis	Unspecified damage occurred in the city.	Ibn al-Dawadari, IX, pp.110-3.	
Marrakech	The earthquake was probably felt.	Ibn al-Dawadari, IX, pp.110-3.	MOROCCO
Tunis	The earthquake was probably felt.	Ibn al-Dawadari, IX, pp.110-3.	TUNISIA
Cadiz	The earthquake was probably felt.	Ibn al-Dawadari, IX, pp.110-3.	SPAIN
Sicily	The earthquake was probably felt.	Ibn al-Dawadari, IX, pp.110-3.	ITALY

The large tsunami and environmental overall effects: summary by locality

Candia (Iraklion)	The sea swept into the city with such force that it destroyed buildings and killed inhabitants. Then it receded rapidly from the port, leaving the sea bed visible.	Riccobaldo da Ferrara, col. 254; <i>Ann. Caesen.</i> , p.75; <i>Ann. Foroliv.</i> , p.59; <i>Cron. Ramp.</i> , II, p.261.	CRETE ISLAND
Acre, 'Akka (Akko)	The sea flooded the shore as far as the tower of Dayan, where objects were found which had been thrown into the sea during the Arab siege of the city. Some people tried to pick them up, but were swept away and drowned by a huge wave. The sea flooded in almost as far as Tall al-Fudul; the sea off Acre receded about two parasangs (12.8 km), revealing a great many objects on the sea bed.	al-Nuwayri, XXX, pp.65-6; al-Maqrizi, <i>al-suluk</i> , I, p.944.	ISRAEL
Alexandria	The sea first receded and then flooded the shore, reaching as far as the city walls. The launderers' shops were submerged and destroyed, as were many foodstuffs near the seashore. At the port, ships' moorings broke and many boats were thrown on to the rocks.	al-Nuwayri, XXX, p.64; Ibn al-Dawadari, IX, pp.110-3; Mufaddal b. Abi 'l-Fada'il, XX, pp.86-90; al-'Ayni, IV, pp.260-5; al-Maqrizi, <i>al-suluk</i> , I, pp.942-3; Ibn Babadur, II, p.205; al-'Amri, XVI, fol.3.	EGYPT





ITALY

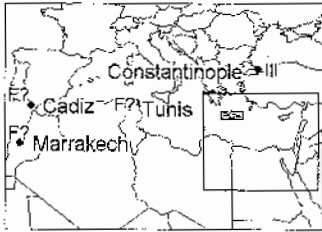
Adriatic Sea Anomalous movement of the sea was observed, but without any resulting damage.

Riccob. Ferr., col.254; *Ann. Caesen.*, p.75; *Ann. Foroliv.*, p.59; *Cron. Ramp.*, II, p.261.

EGYPT

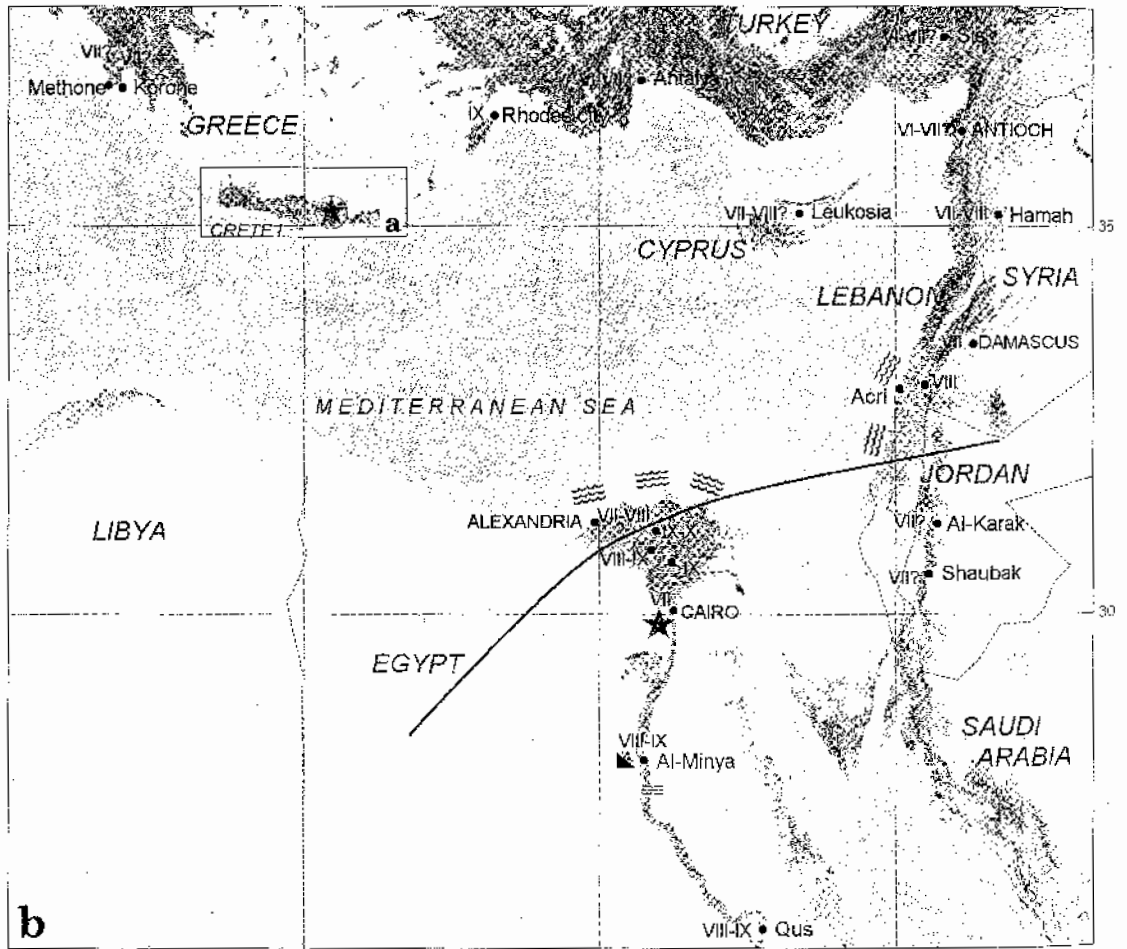
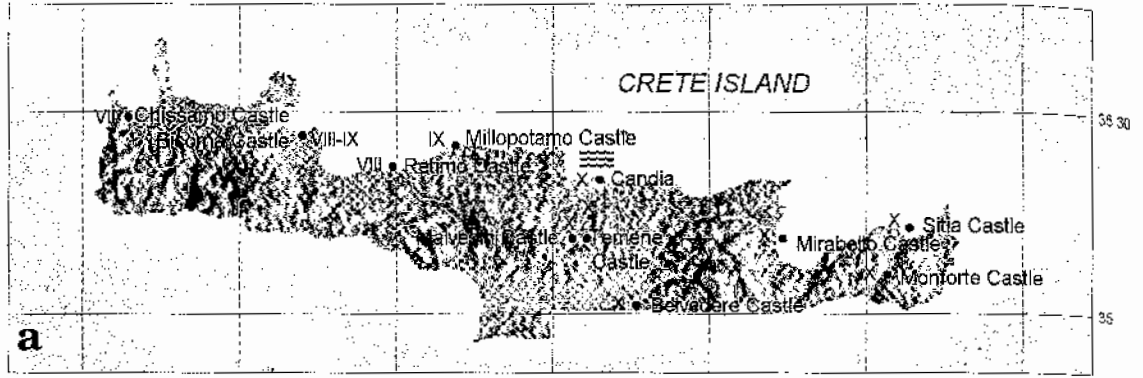
Al-Minya The waters of the Nile parted to reveal the river bed, and then came together again. Some landslides occurred in the mountains around Minya.

Anon., *Ta'rikh*, pp.126-7.



1303
August 8

0 60 km



figg. 70a - b The line indicates the area of a second earthquake in Egypt, as suggested by El-Sayed *et al.* (2000) on the basis of the sole distribution of seismic effects established in Ambraseys *et al.* (1994) and Guidoboni and Comastri (1997). For the calculation of the magnitude a new experimental term of the "Boxer programme" has been used (see Gasperini *et al.* 1999, 2004), elaborated by P.Gasperini.

▲ 1303 08 08 3:30 UT ★ = 35 11 25 38 I ₀ = X Me = 8.0 Sites: 38 EE: 1 Ts							
localities	lat.	long.	I	localities	lat.	long.	I
Belvedere Castle GR	35 01	25 16	X	Hamah SYR	35 09	36 44	VII-VIII
Iraklion GR	35 20	25 09	X Ts	Nicosia CY	35 10	33 22	VII-VIII?
Malvesin Castle GR	35 11	25 04	X	Al-Karak HKJ	31 11	35 42	VII?
Mirabello Castle GR	35 11	25 44	X	Ash Shawbak HKJ	30 32	35 34	VII?
Monforte Castle GR	35 06	26 04	X	Cairo ET	30 03	31 15	VII
Sitia Castle GR	35 13	26 08	X	Chissamo Castle GR	35 29	23 39	VII
Temene Castle GR	35 11	25 06	X	Damascus SYR	33 30	36 19	VII
Sakha ET	31 05	30 57	IX-X	Koroni GR	36 47	21 56	VII?
Damanhur al-W. ET	30 41	31 13	IX	Methoni GR	36 49	21 42	VII?
Milopotamo Castle GR	35 25	24 41	IX	Sawad	— —	— —	VII?
Rhodes city GR	36 26	28 13	IX	Antalya TR	36 53	30 42	VI-VII?
Abyar ET	30 50	30 52	VIII-IX	Antioch TR	36 14	36 07	VI-VII?
Al-Minya ET	28 06	30 45	VIII-IX EE	Sis TR	37 27	35 49	VI-VII?
Bicornia Castle GR	35 27	24 12	VIII-IX	Cadiz E	36 32	-06 18	F?
Jazira	— —	— —	VIII-IX	Marrakech MA	31 49	-08 05	F?
Qus ET	25 55	32 45	VIII-IX	Sicily I			F?
Versf. Jscopoli Castle	— —	— —	VIII-IX	Tunis TN	36 50	10 13	F?
Retimo Castle GR	35 22	24 29	VIII	Istanbul TR	41 02	28 57	III
Zefat IL	32 58	35 30	VIII	Akko IL	32 55	35 04	Ts
Alexandria ET	31 12	29 55	VII-VIII Ts	Adriatic Sea	— —	— —	Ts

< 161 > 1303 August - October Central Adriatic Sea ▷ tsunami ◁

sources Chron. Parm., p.86; Zibald. Canal, pp.99-100
 literature Guidoboni and Mariotti (1997); Mariotti et al. (2000)
 catalogues d. Mercalli (1883); Baratta (1901)

Although this earthquake does appear in the 19th century Italian seismological tradition (Mercalli 1883, p.223; Baratta 1901, p.627), it has not reached second generation Italian catalogues up to and including Postpischl (1985), and consequently does not appear in the most recent Italian compilations. It may well have been mistaken for a doublet of the great Mediterranean earthquake of 8 August 1303 (see the preceding entry) and therefore eliminated. This earthquake has, in a sense, remained in the shadow of the great Mediterranean earthquake of August 1303. Earthquakes which occur soon after other important seismic events are either not mentioned in the sources, or if they are, they run the risk of not being recognised as separate events, and hence may be eliminated from catalogues. In this case, the earthquake is recorded in the authoritative *Chronicon Parmense*, and its occurrence is confirmed by the *Zibaldone da Canal*, an independent Venetian source.

During 1303 an earthquake caused damage in the *Marca anconitana*, that is to say in an area covering a large part of the present-day Marche region in central Italy. Many towers and houses were damaged in the towns of Senigallia and Fano on the Adriatic coast. The town hall at Fano, which had only recently been built, was badly damaged or collapsed (*si disfece*). Furthermore, an unspecified town in *Slavania* was "reduced to ruins" (*ruinata*) and may have been struck by a tsunami. The name "Slavonia" was used at that time to refer to an area which is now Slovenia, Croatia and Bosnia-Herzegovina. Bearing in mind the earthquake's effects in Italy, and the fact that a tsunami is mentioned, it is reasonable to suppose that the affected area was along the Croatian coast, that is to say in what is now central Dalmatia, including the towns of Zadar and Split. The sources do not provide a precise chronology for the event, but it can reasonably be

assumed to have occurred between August and October 1303, since a reference to the earthquake in the *Chronicon Parmense* is inserted between events occurring between July and October 1303, and in the text of the *Zibaldone da Canal* the earthquake seems to have occurred after the one in Crete on 8 August 1303. There remains a legitimate doubt as to whether these were two separate earthquakes — one in the Marche and the other in central Dalmatia — or a single event, as we think, having its origin in the Adriatic and effects on both coasts, which are about 200 km apart. The *Chronicon Parmense* is an anonymous chronicle, but was almost certainly written by a notary or judge who lived in Parma between about 1270 and 1340. In listing the events of 1303, the text seems to refer to more than one earthquake, so the famous earthquake of 8 August in Crete (*in locis et civitatibus juxta mare*) may be included.

“And in that year [1303], in the area of the March of Ancona and of Romagna, in towns and cities by the sea and in the city of the Veneti and in Slavonia there were many great earthquakes which reduced many towers and houses to ruins, especially at Fano and Senigallia, and a whole town in Slavonia was reduced to ruins and the sea swallowed it up”.

Item eodem anno in partibus Marchie Anconitane et Romandiole, in locis et civitatibus juxta mare, et in civitate Venetiarum et in Sclavania, magni et multi terremotus fuerunt, ita quod propter ipsos multe tures et domus ruinate fuerunt, maxime in Fano et in Senegalia, et una civitas tota de Sclavania ruinata fuit, et mare sufocavit eam.

The other source, the *Zibaldone da Canal*, is a Venetian manuscript dating to the second half of the 14th century. It was published by Stussi in 1967, and contains miscellaneous items of information, including a short Venetian chronicle at folios 57r.-59r. It mentions the earthquake of 8 August 1303 in Crete, attributes to it damage in the *Marcha* (i.e. the March of Ancona) — actually the result of a separate event — and states that it was felt in Venice. The text is as follows:

“During the year 1303, on the morning of Thursday 8 August, there was a great earthquake in the island of Crete [...] and it was felt in Venice, but by the grace of God it did no damage. And in the March [of Ancona] [the earthquake] did great damage and the new *palazzo* at Fano was destroyed”.

Corando MIIJ^oIIJ ani a di VIIJ del mexe d'avosto una çobia maitin si fo lo gran taramoto in l'issola de Crede [...] et in Venexia si fo sentido, ma, la merçè de Dio, ello non fesse dano allgun alla tera. Et in la Marcha fesse gran dano et in Fan se sfesse lo so pallaço nuovo.

The sources mentioned by Mercalli (1883, p.223) are the *Annales Caesenates* and the *Annales Forolivienses*, which date the earthquake to 1302: but a first hand examination of these texts reveals that they do not mention the March of Ancona or Slavonia, simply referring to the 8 August 1303 earthquake in Crete, but with the wrong date. Perhaps Mercalli made use of a different source (probably the *Chronicon Parmense*) but did not cite it.

▲	1303 08 -- 10 --	★ = 43 46 14 01	lo = VIII	Mc = 5.6	Sites: 4	Ts		
	localities	lat.	long.	I	localities	lat.	long.	I
■	Central Dalmatia HR	43 45	15 50	IX Ts	Senigallia	43 43	13 13	VIII
	Fano I	43 50	13 01	VIII	Venice	45 26	12 20	F

< 162 > **1304 October 23 Po Plain [northern Italy]**

sources 1 [manuscripts] ASPe, *Opere pie, istituzioni di assistenza e beneficenza, ospedali*, Diplomatico, no.9, *Notula*, 1304

Chron. Parm., p.89; *Chron. Est.*, p.59; Calendar, in Porro (1881, p.627)

- sources 2 Agazzari, *Chron.*, p.34; Mussi, *Chron.*, col.485; Pagliarino, *Cron.*, p.79
- historiography Tononi (1910)
- catalogues d. Perrey (1848); Mallet (1853); Piovene (1888); Baratta (1901); *Boschi *et al.* (1995, 1997, 2000)
- catalogues p. Giorgetti and Iaccarino (1971); Carrozzo *et al.* (1973); Bernardis *et al.* (1977); Postpischl (1985); CPTI (1999)

In the night between 22 and 23 October 1304 at about 0:45 UT an earthquake affected lower Lombardy and upper Emilia. The shock was strongly felt at Ferrara, Morimondo (in the present-day province of Milan), Parma and Piacenza. Since no damage is recorded but the felt area was large and the shock strong, it may have been a deep earthquake in the Po Plain. The earthquake is recorded as affecting Piacenza in a contemporary *Notula* on parchment which forms the cover of a collection of deeds drawn up between 1287 and 1304 by Rizzardo Rizzardi, a notary of Piacenza (Archivio di Stato, Piacenza). It is also recorded in a contemporary liturgical calendar from the monastery of Morimondo, in the contemporary *Chronicon Parmense*, in the *Chronicon Estense* (second half of the 14th c.), and in two later chronicles from Piacenza. The *Notula* reads as follows:

"In the year 1304, in the third indiction, at night, in the middle of the night, when the friars' bell was ringing between Thursday 22 March and the next day, Friday, there was so great an earthquake in the city of Piacenza that it seemed roofs would collapse, and they rattled loudly throughout the city. Everybody was very frightened, and many rose from their beds".

Millesimo trecentesimo quarto inditione tertia in nocte in hora medie noctis quando signum fratrum pulsabat die Iovis XXII mensis Martii praecedente et die Veneris sequente adveniente, terremotus magnus fuit in civitate Placentiae talis quod videbatur quod tecta domorum velent diruere et magnus tremor sonitus et strepitus fecerunt tecta domorum per totam universam civitatem. Et gentes omnes maximum metum habuerunt et multae gentes de letulis surrexerunt.

Rizzardi dates the shock to the night of Thursday 22 – Friday 23 March 1304. The dates do not fit the days of the week, however, for 22 March 1304 was not a Thursday but a Sunday, whereas 22 October was indeed a Thursday. That a great earthquake did occur at Piacenza on 23 October 1304 is recorded by two chroniclers from Piacenza, namely Mussi (14th c.) and Agazzari (15th c.).

A contemporary liturgical calendar from the monastery of Morimondo (in Porro 1881, p.627) provides chronological details in recording that a great earthquake occurred in the night between Thursday 22 and Friday 23 October 1304:

"1304 Friday 23 October at about the middle of the night, that is to say between Thursday and the said Friday, there was a great earthquake [at Morimondo], which lasted as long as it takes to recite a Miserere".

MCCCIIIJ die Veneris XXIIJ octobris circa noctis medium quod vere erat diem Iovis et diem predictum Veneris factus fuit terremotus magnus ita ut possit dici Miserere mei deus.

The days of the week indicated by the chronicler are correct, for 22 October 1304 was indeed a Thursday. The duration suggested is equivalent to about 65 seconds (Ferrari and Marmo 1985). At the year 1304, the *Chronicon Parmense* records an earthquake in Parma and Lombardy on 22 September:

"In that same year [1304] in the said month of September, on the 22nd day of the said month, at the hour in the middle of the night, at the peal or morning bell of the friars, there was so great an earthquake in the town and diocese of Parma and in other places in Lombardy and beyond, that it was clearly heard and felt, and even seen by those who were keeping watch".



1304
October 23

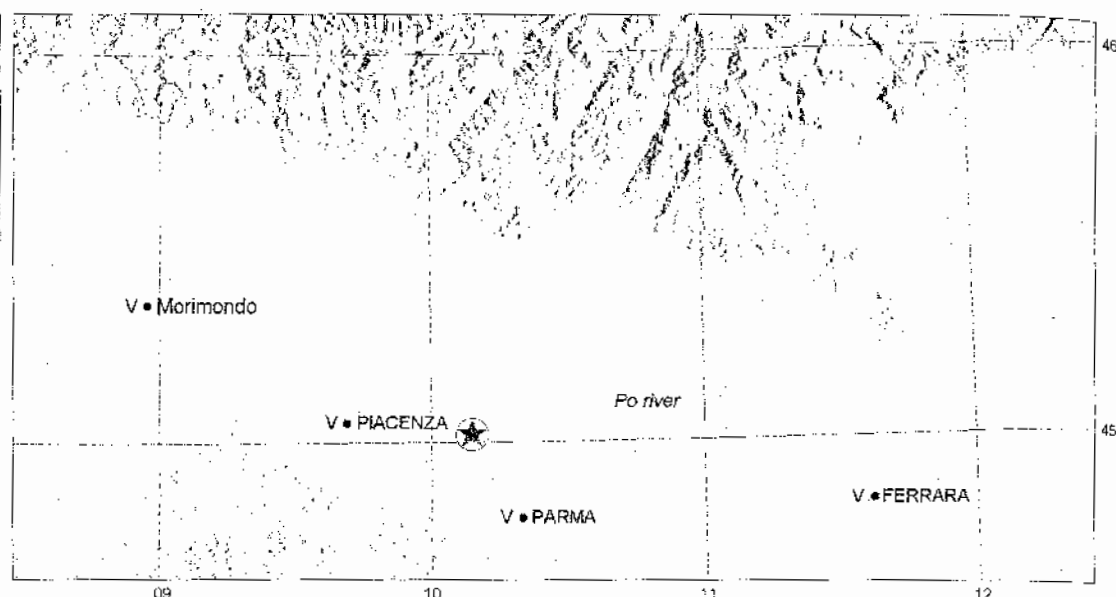


fig. 71

Item eo anno de dicto mense setembri, die xxij dicti mensis, in hora medie noctis, schilis seu matutinis fratrum, maximus terremotus fuit in civitate et episcopatu Parme, et alibi per Lombardiam et ultra, ita quod palam auditus et sentitus fuit, et eciam vissus per homines qui vigilabant.

The time of the earthquake given by the anonymous Parma chronicler (*"in hora medie noctis"*) is reminiscent of that in the Morimondo monastery calendar, though the latter dates it to 23 October. The *Chronicon Parmense* does not give the day of the week — a detail which would have made it possible to determine with certainty whether this was a separate shock or the same as that of 23 October, as the time of day indicated seems to suggest. The *Chronicon Estense*, which was compiled in the second half of the 14th century, records an earthquake at Ferrara on 23 October 1304: "1304. On 23 October of this same year, there was a very great earthquake".

MCCCIIIJ. Eodem millesimo, die XXIII mensis octubris. Fuit terremotus maximus.

In Postpischl's catalogue (1985), this earthquake is located at Montebello (near Vicenza) and dated to 23 October 1303, on the basis of another parametric catalogue (Bernardis *et al.* 1977), which refers back to Baratta (1901). In fact, however, Baratta indicates in the *errata corrige* to his book that the year of the earthquake should be corrected from 1303 to 1304. The information about Vicenza is quoted from Baratta (1901) and comes via Piovene (1888) from Pagliarino (p.79), a notary who lived in the first half of the 15th century. As shown in detail in CFTI (1997, pp.151-2), however, the earthquake referred to is that of 30 November – 1 December 1298, which occurred not at Vicenza but at Rieti.

▲ 1304 10 23 00:45 UT ★ = 45 01 10 09 I₀ = V Me = 4.6 Sites: 4

localities	lat.	long.	I	localities	lat.	long.	I
Ferrara	44 50	11 37	V	Piacenza	45 03	09 42	V
Parma	44 48	10 20	V	Morimondo	45 21	08 57	V

< 163 > 1307 August 10 Egypt

source Mufaddal b. Abi 'l-Fada'il, *al-Nahj*, XX, p.134

catalogue 6. *Ambraseys *et al.* (1994)

On 10 August 1307, there was an earthquake in Egypt. It is recorded as being brief, and there is no mention of damage. The source for this earthquake is the 14th century Coptic historian Mufaddal b. Abi 'l-Fada'il, who wrote a history in Arabic covering the years 1260-1340:

"In that year [707 H.], during the night of Thursday 9 *Safar* [10 August 1307], there was an earthquake in Egypt, but it did not last for long".

و فيها في ليلة الخميس التاسع من شهر صفر حصل بالديار المصرية زلزلة و لم يطل مكثها.

△ There are no elements with which to indicate the parameters.

< 164 > **1308 or 1319?** [757 A. e. or 768 A. e.] **Maku [Iran]**

source Sam. An. Cont., p.165
 historiography Zeyt'unyan (1991)
 literature Abich (1882)
 catalogue d. Step'anyan (1964); Ambraseys and Melville (1982)

In the year 757 of the Armenian era (4 January 1308 – 30 December 1308), a strong earthquake caused the collapse of the church and monastery of St. Thaddeus at Maku (now in Iran), killing 75 people.

The source for this earthquake is the continuation of the chronicle of Samuel of Ani, which records:

"In the year 757 [4 January 1308 – 30 December 1308] there was an earthquake at the monastery of St. Thaddeus the Apostle, which destroyed the church and monastery, killing 75 people".

Ի ձձԷ. ամի շարժ տարաւ զվանքս. առաքելոյն Թադէոսի, զեկեղեցիսն և զվանք գործանեսաց⁷ և շէ. հոգի սպան.

There is some doubt about the correct date of this earthquake, because another passage in the continuation of Samuel of Ani's chronicle gives a very similar report of another destructive earthquake at Maku in the year 768 of the Armenian era (1319), which killed 65 people:

"In the year 768, a terrible earthquake occurred in the East and destroyed the Surb T'adeos monastery and church, reducing houses to ruins, and killing 65 people. Ter Zak'are rebuilt the church and the monastery".

▲ 1308 or 1319

localities	lat.	long.	I
Maku	39 17	44 33	A (IX)

< 165 > **1308 January 25 Rimini Adriatic coast [Italy]**

sources 1 [manuscript] BAVat., *Vat. Lat.*, 9375, fol.224v., *Notula*;
 Riccob. Ferr., *Comp.*, col.255
 source 2 *Cron. Ramp.*, II, p.279
 historiography Clementini (1617-27); BCGambRimini, *Mss.*, 174-77, Villani, *De vet.*, III, c.33r.; *Mss.*, 209-14, Pedroni, *Sei lib.*, I, c.49v.; Tonini (1848-88; 1895); Massera (1912-13); Gobbi and Sica (1982)
 literature Serpieri (1878); Guidoboni and Ferrari (1986)
 catalogues d. Perrey (1848); Mallet (1853); Mercalli (1883); Baratta (1899; 1901); *Boschi *et al.* (1997, 2000)
 catalogues p. Giorgetti and Iaccarino (1971); Carrozzo *et al.* (1973); Postpischl (1985); CPTI (1999)

On 25 January 1308 at about 17:15 UT (i.e. at dusk, when friars were at compline), a strong earthquake struck Rimini. According to contemporary sources, the earthquake caused the collapse of part of a church, which may well have been that of S.Francesco. The whole of the sacristy and chapter house were destroyed. There was also serious damage to many other buildings, some of which collapsed; and cracks appeared in many houses. According to 17th century writers, the earthquake caused long stretches of the town walls to collapse, partly or completely destroyed the many towers in the town, and seriously damaged all the houses, some of which collapsed or were demolished. The great Roman Arch of Augustus, which still exists, was also damaged and later restored. At the time of the earthquake, Rimini was an important urban centre and the seat of a bishop, and its dependent territory roughly corresponds to the area of the present-day commune. Although the town still had communal institutions in the early 14th century, the lordship of the Malatesta family was in the process of being imposed there. The physical characteristics of the town were then quite different from today, for the population density was very low, and the coastal area was entirely uninhabited. Its principal economic activities were agriculture in the area close to the town, and the production of artisan goods for the local market.

The earthquake is described in two contemporary sources. The most important of these is a manuscript note by an eye-witness, while the other is an early 14th century chronicle by Riccobaldo, a notary of Ferrara. The manuscript note by an eye-witness was identified in codex *Vaticano Latino* 9375 (fol.224v.) in the Biblioteca Apostolica Vaticana. Although attention was drawn to the codex by Baratta (1899), it was not used in his 1901 catalogue. Baratta (1899) simply remarked that the codex referred to a "great earthquake", whereas the note in question actually contains a great deal more information than such a terse remark might suggest. The note is written at the end of a sermon by an anonymous Franciscan inquisitor who had been sent to Romagna and was at Rimini when the earthquake occurred. The source specifically dates the earthquake to Thursday, 25 January 1308, the feast of the Conversion of St.Paul, and states that it occurred in the evening, while the friars were at compline. The note also describes damage to buildings belonging to a Rimini church. Since the writer was a Franciscan friar, it seems reasonable to suggest that the church in question was S.Francesco, which had belonged to the Franciscans since the mid-13th century. The text of the note is as follows:

"In the year of Our Lord 1308, while I was there [at Rimini] and was writing this narrative on Thursday, at the time when the friars were saying evening compline in the choir, so great an earthquake struck Rimini, where I then was, that part of the church of the Rimini friars collapsed. The whole of the friars' sacristy and chapter house collapsed on that day, 25 January, the feast of the Conversion of St.Paul the Apostle. And all the people of Rimini said that they had never seen or felt so great an earthquake. But many buildings were reduced to ruins that evening. May Christ, who was crucified for sinners, lead us to his grace. Amen."

Anno domini MCCCVIII dum ibi essem infra expositionem istam die iouis hora qua fratres dicebant completorium de sero in choro venit subito in arimino me ibi existente terremotus ita magnus quod cecidit de ecclesia fratrum de arimino una pars et cecidit tota sacrestia et capitulum fratrum XXV die ianuarii in qua die fuit festivitas conversionis beati pauli apostoli. Et comunitatis dicebant omnes de arimino quod numquam viderant vel senserant tam magnum terremotum. Multa autem hedificia corruerunt illo sero Cristus pro peccatoribus crucifixus perducat nos ad gratiam suam. Amen.

The church of S.Francesco, formerly S.Maria in Trivio, was attached to a large convent and at that time stood on the edge of the built-up area of the town. The Malatesta family subsequently made it their family church (Gobbi and Sica 1982).

The other contemporary source, Riccobaldo's chronicle, is much briefer:

"A great earthquake at Rimini shook many buildings and produced cracks in them, and it razed a few to the ground".

Terraemotus magnus Arimini aedificia multa concussit et scidit, quemdam etiam stravit in humum.

Riccobaldo does not explicitly date the earthquake; but there is an indirect indication of when it occurred in the fact that it is reported immediately before the death of Azzo III, marquis of Este and lord of Ferrara, which occurred on 31 January 1308.

Riccobaldo's evidence is very reliable. His chronicle is in fact a source of great value for the history of central and northern Italy in the late Middle Ages. Riccobaldo's text is taken up almost word for word by the 15th century *Cronaca Rampona* from Bologna. Contemporary chronicles in the Romagna area say nothing of the earthquake in relation to Rimini or the coastal region. Nor is it mentioned in the *Chronicon Ariminense*, compiled by an anonymous author in the second half of the 14th century, or in the *Marcha*, a historical compilation by Marco Battagli, who was active at Rimini in the first half of the 14th century. It is reported, however, in the compilations of some 17th century local historians from Rimini. The historian Clementini (1617-1627), a canon named Pedroni (17th c.) and a governor named Villani (17th c.) all record it in a different form from that found in Riccobaldo da Ferrara, for they add a precise date and time, and describe its destructive effects in three very similar accounts; and they also all mention the organisation of penitential ceremonies afterwards.

The lack of similarity between Riccobaldo's account and that found in erudite 17th century literature from Rimini can be explained by the use in the latter of an earlier local

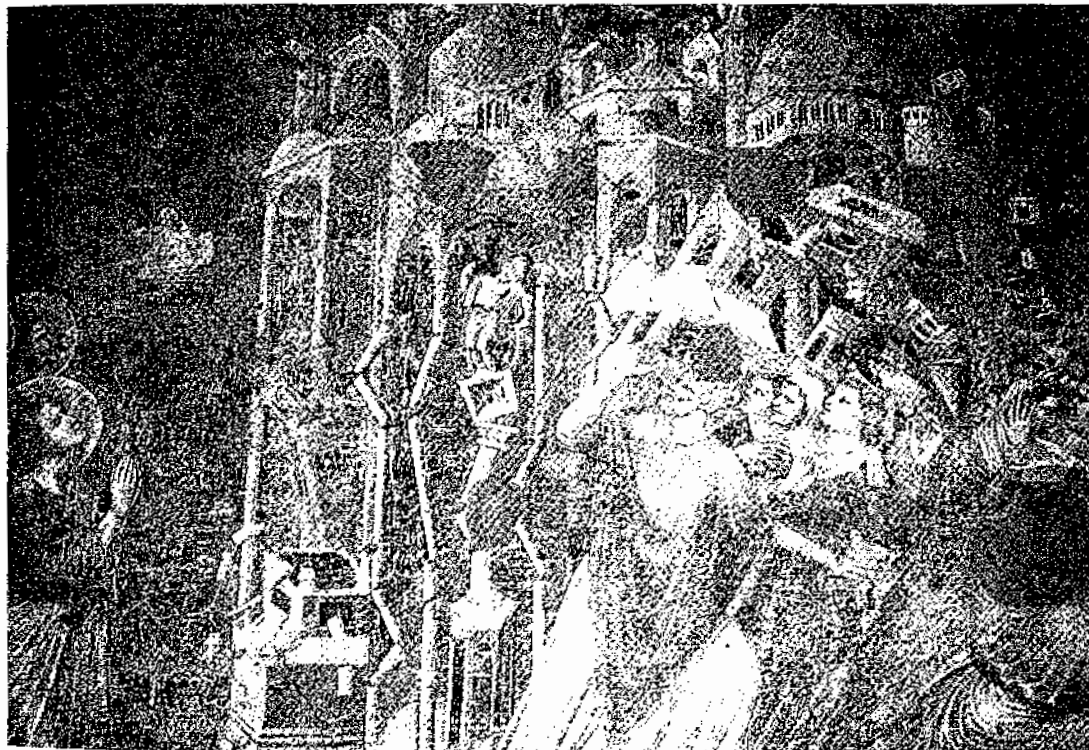


fig. 72 Rimini, church of S. Agostino. The Rimini school fresco (14th century) depicts a 'miraculous' earthquake as preserved in medieval tradition: St. John the Evangelist is seen causing the collapse of the temple at Ephesus. The earthquake of 1308 is likely to have provided the occasion for this fresco, which came to light when the earthquake of 17 May 1916 (Rimini, Io = VIII, Me = 5.8) brought down the plaster covering the fresco.

Insuper habet pueri et puera remanere. Anno dñi mccc
 Quia tunc ista cepit, ista de iouis hōis q̄ fr̄s dicitur
 p̄pletus de seip̄o t̄pore. uenit pulato i arimino. me ibi exi
 stente t̄pore t̄a maḡ q̄ cecidit y cetera f̄m de arimi
 no una ps. et cecidit tota p̄c̄pta et cap̄ f̄m xxv de
 Ianuari. t̄q̄ de fuit festu n̄d̄t̄is b̄ti pauli apl̄i Et
 cetera dicitur q̄ de arimino. q̄ n̄d̄t̄ uiderat ul̄ p̄p̄t̄
 Et maḡ t̄pore t̄a n̄d̄t̄ h̄d̄t̄a c̄p̄t̄ illo p̄

fig. 73 Description of the earthquake at Rimini on 25 January 1308, written by a friar inquisitor. When the earthquake occurred the author was at the Franciscan convent in Rimini (Biblioteca Apostolica Vaticana, *Vaticanus Latinus* 9375, fol.224v). Transcription and translation on p.368.

source forming part of a local tradition which was independent of Riccobaldo. The source concerned was the chronicle of Roberto of Rimini, a Dominican friar. Pedroni (Biblioteca Civica Gambalunga, Rimini, *Manoscritti*, 209-214, vol.I, fol.49v.), provides a transcription (how faithful, we cannot tell) of a work by Fra Roberto entitled *De civitate Arimini*. Contrary to what we are told by the historian Tonini (1848-1888, vol.4, p.23), the original manuscript is not now in the Biblioteca Gambalunga at Rimini, and can be assumed to be lost. We have no reliable information about Fra Roberto. According to Tonini, he lived in the early 16th century, but according to Massera (1912-13, p.XXXIX), who edited Marco Battagli's chronicle, he lived at least a century earlier than that. One iconographic source which has been identified as conveying the powerful emotional impact of this earthquake on local culture, is an early 14th century fresco of the Rimini school, now on the left-hand wall of the apse in the church of S.Agostino at Rimini. The fresco came to light when the earthquake of 17 May 1916 brought down some plaster. It depicts St.John the Evangelist in the act of destroying the temple at Ephesus, as described in the Revelation of St.John (see fig. 72).

localities	lat.	long.	I
Rimini	44 04	12 34	VII-VIII

< 166 > 1313 February 27 Egypt

source Mufaddal b. Abi 'l-Fada'il, *al-Nahj*, XX, p.227
 catalogue d. *Ambraseys *et al.* (1994)

On 27 February 1313, there was an earthquake in Egypt. It is recorded as being brief, and there is no mention of damage. The source for this earthquake is the 14th century Coptic historian Mufaddal b. Abi 'l-Fada'il:

"On Monday 29 *Shawwal* [27 February], there was an earthquake in Egypt, but it did not last for long".

وفي يوم الاثنين التاسع والعشرين من شوال حصل بالديار المصرية زلزلة ولم يطل مكثها.

Ambraseys *et al.* 1994 (pp.100-1) locate this earthquake in lower Egypt and give it a class F epicentral intensity, i.e. "felt to strong" (up to VI MSK).

△ There are no elements with which to indicate the parameters.

< 167 > 1315 September 29 Constantinople? [north-western Turkey]

source *Chron. min. Byz.*, 9.1, in Schreiner (1975, p.91)
historiography Schreiner (1977)
catalogue d. Evangelatou-Notara (1993)

The earthquake is not known to the seismic catalogue tradition, but is recorded in Evangelatou-Notara (1993, p.48).

On 29 September 1315, an earthquake was felt, possibly at Constantinople. It is described as "great", but no effects are specified.

It is referred to in the chronicle in codex 3632, fol.352v. in Biblioteca Universitaria in Bologna (published in Schreiner 1975, no.9, p.91):

"In the year 6824 [1 September 1315 - 30 August 1316], on 29 September, the great earthquake occurred".

ἔται λαοκδ', σεπτεβρίῳ καθ', γέγονεν ὁ σεισμὸς ὁ μέγας.

▲ 1315 09 29

localities	lat.	long.	I
Istanbul	41 02	28 57	V-VI?

< 168 > 1315 December 3 L'Aquila area [central Italy]

sources 1 [manuscript] ASNa, *Uff. Ricostr. Ang., Notamenti*, arm.Ib, De Lellis, *Notam.*, vol.4, p.902, Robert of Anjou, Order, 9 March 1317
Buccio Ran., *Cron.*, pp.53-4
source 2 *Cronachetta anon.*, p.4
historiography Cirillo (1570); Collenuccio *et al.* (1591); Antinori (ed. 1971); Casti (1893); Vittori (1896); D'Angelo (1915); Gavini (1915); Spagnesi and Properzi (1972); Pietrantonio (1988)
literature Guidoboni and Ferrari [1994]; D'Addezio *et al.* (1995)
catalogues d. Filippo da Secinara (1652); Perrey (1848); Mallet (1853); Mercalli (1883); Baratta (1901); *Boschi *et al.* (1997, 2000)
catalogues p. Giorgetti and Iaccarino (1971); Carrozzo *et al.* (1973); Postpischl (1985); CPTI (1999)

History of the earthquake's interpretation

Prior to research carried out in 1994, this earthquake had been located at L'Aquila in Italian catalogues from Baratta (1901) to Postpischl (1985), and its effects had been estimated at grade VIII on the MCS scale. It appeared to be one of the many medium impact earthquakes in the Apennines. A research has been carried out (Guidoboni and Ferrari 1994) in connection with work on the *Catalogue of strong Italian earthquakes* (Boschi *et al.* 1995) and palaeoseismological research (D'Addezio *et al.* 1995). In fact, an examination of the territorial and historical background was enough to arouse certain doubts. L'Aquila was indeed the only cultural and urban centre capable of recording and passing on to posterity the effects of an earthquake. But where exactly did it occur, and how big was it? L'Aquila was a strategically important city situated at the frontier between the Kingdom of Naples and the Papal States. It had been founded in 1254, and the built-up area continued to expand throughout the 14th century. In this border region, it was one of the few inhabited places "culturally" capable of registering the effects of an earthquake in a written record, because there were amongst its inhabitants a few intellectuals (poets and historians) capable of making such a record. It is therefore not surprising that the earthquake should become associated in chronicles solely with the city, rather than the area around it. Fresh historical research has therefore taken as its starting point an examination of the surrounding area.

The creation of a new commune in the 13th century had involved territorial reorganisation in the L'Aquila area. In particular, the *contado* (or *terra* was the district outside the town) was largely cut out of the ancient diocese of Forcona, to which were added parts of the *contado* of Rieti and Sulmona. The *contado* of L'Aquila was extremely large: a privilege granted in a diploma of Charles II of Anjou, dated 1294, shows that this territory included at least 70 castles and other villages. A document from the Angevin Chancery, dated 1317, which describes the earthquake as "frightening" (*pavido*), and the way the territory of L'Aquila was affected as "terrible" (*terribiliter*). Soon after the earthquake, the king, Robert of Anjou, ratified a peace agreement drawn up between the city factions "when a frightening earthquake struck that place"; so the king granted a pardon for crimes committed during the hostilities between the factions. The pacification of the warring factions thus occurred at the time of the earthquake, but the background was much broader and more dramatic than evidence about L'Aquila would suggest, if taken on its own. For a "frightening earthquake" such as that referred to by the king could not simply be a modest local shock.

It is on the basis of this document — which is not contradicted by contemporary chronicles — that the earthquake has been given a higher intensity classification.

Effects of the earthquake

The principal shock occurred on 3 December 1315, causing damage at the city of L'Aquila, the most important cultural and political centre in *Abruzzo Ultra* (present-day northern Abruzzo). Two churches are recorded as having collapsed there. But the many villages subject to administrative control by L'Aquila were probably the worst affected places. The shocks lasted for more than four weeks.

L'Aquila cathedral was so badly damaged that it was subsequently rebuilt (Spagnesi and Properzi 1972, p.95); the old church of S.Liberatore, which had been built about 1268 and stood next to the monastery of S.Francesco, was badly damaged and later repaired, the new church being dedicated to S.Luigi, brother of king Robert of Anjou, who was canonised in 1317. At the end of the 15th century, the building changed its name again, becoming the church of the SS.Concezione (Antinori ed. 1971; Casti 1893, p.119).

At L'Aquila, the earthquake probably affected brand new or unfinished buildings. But we know scarcely anything about the urban landscape, perhaps because it consisted characteristically of ordinary dwellings of a very impermanent kind (upper class *palazzi* excepted). The chief administrative authority was delegated by the court of Naples to a royal *capitano*, who resided at L'Aquila but was not a local man, whereas matters of ordinary administration were in the hands of the city authorities. Throughout the 14th century, city institutions were made unstable by clashes between the two factions of the Parattati and Camponeschi.

We have no information about other towns, either for lack of contemporary sources, or because it is impossible to attribute an *ex silentio* value to available documents. The epicentral area cannot be clearly identified, but the available evidence suggests that this was an event with a much higher energy level than was previously thought. Although it is difficult to give a quantitative value to our research results, we have tried to make that task easier by establishing a notional point within the area of L'Aquila and its 70 fortified settlements, where we think the maximum effects were felt.

Historical sources

The principal and most authoritative contemporary source — not previously known to the seismological tradition — is an order from the Naples chancery, dated 9 March 1317, which survives in a copy transcribed by the 17th century scholar Carlo de Lellis (Archivio di Stato, Naples). The original Angevin archive was destroyed in a fire on 30 September 1943. Hence our documentary research and interpretation of the chronicle sources was guided by a growing suspicion that the written tradition of the city "con-

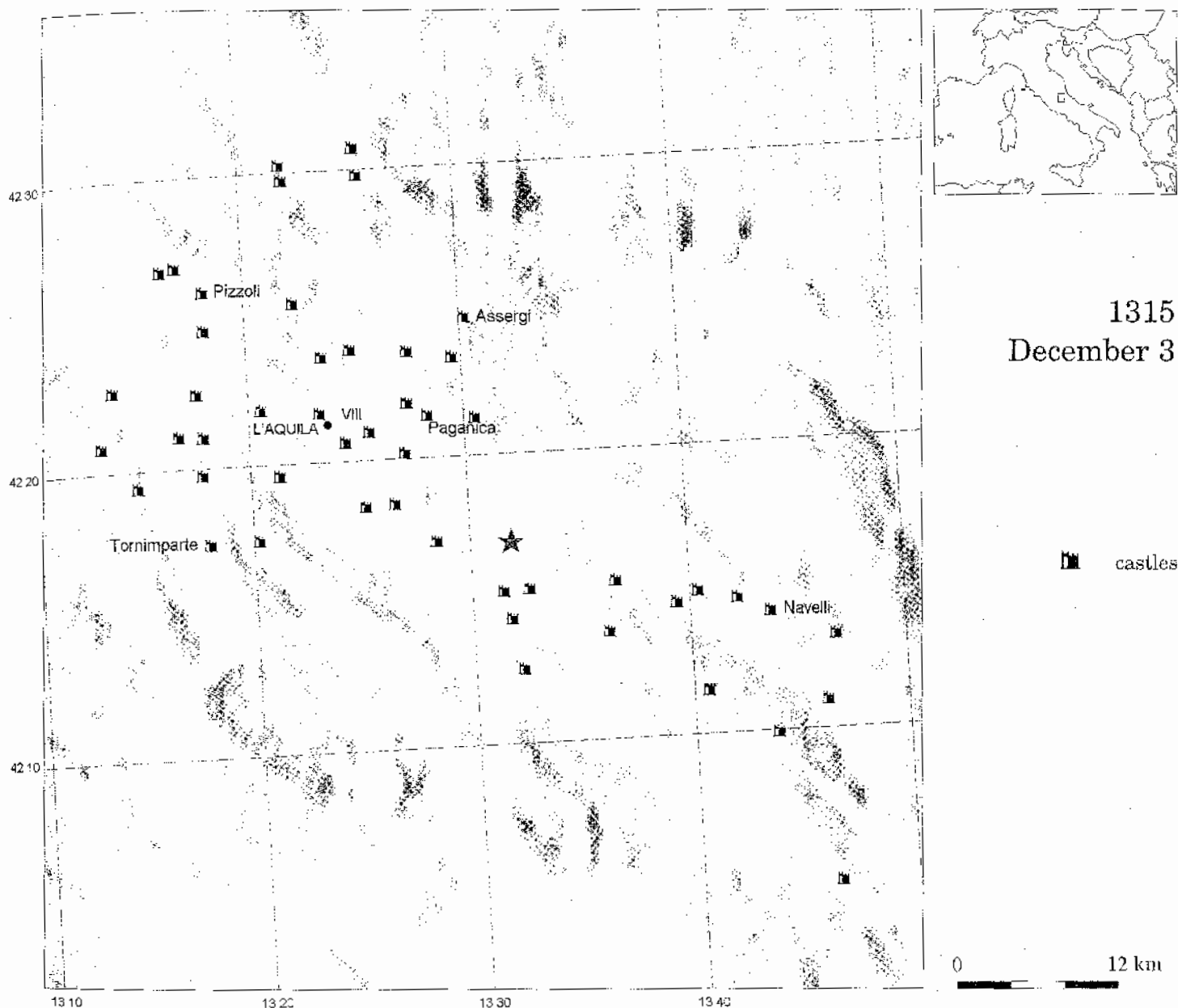


fig. 74 The map shows the location of 50 of the 70 fortified village (*castella*) which together formed the territory of the city of L'Aquila at the beginning of the 14th century. As can clearly be seen, it was a quite extensive mountain area. The written sources record serious damage in this territory, but do not name any individual castle. The epicentre indicated is at the centre of the hypothetical damage pattern of this inhabited area (after Guidoboni and Ferrari 1994).

sealed" a much more destructive event. This is what the document actually says: "Approval of an agreement made by certain men of L'Aquila during the hostilities between them; and pardon for these same men, since they were struck with fear at the strong shaking when a frightening earthquake soon afterwards struck that place in a terrible way, and they abandoned their wrongdoing and returned to the narrow path of their conscience. So they gave up their hatred of each other and established peace, each party forgiving the murders and harm done by the other. 9 March, in the fifteenth indiction, 1317, folio 203".

Certis hominibus Aquile assensus super concordia inter eos per inimicitias; et indultus, quia terremotu pavido diebus proximis terram ipsam terribiliter quatiente homines ipsi valido tremore concussi avertentes a deviiis claustra conscientie intraverunt, et relaxatis in vicem odiis pacem inhierunt sibi remicentes altrinsecus homicidia, et damna. Sub die 9 martii 15 indictionis 1317 folio 203.

Of all the chronicle sources, the most informative is that of Buccio di Ranallo, composed in verse between 1355 and 1363. Here is the most significant passage (the original text is in the Italian vernacular with strong dialectal elements):

"Then came the earthquakes I have described, / in the month of December, early on the third day; / and you should know, dear brothers, that they struck on a Wednesday, / and it was during the holy days of the *Quattro Tempora*! / The earthquakes lasted more than four weeks, / we slept in huts and were badly frightened, / we did penance morning and evening; / everyone went about whipping themselves, with whips in their hands. / Much peacemaking occurred between sworn enemies / for we had had a war and had suffered much; / if you ask me when this happened, / it was during the year 1315 or 1316".

Foro le terremuta, le quali v'ò contati, / Dello mese de decembero ad li tre giorni intrati; / Et de mercordi furono, sacciate, cari frati, / Et era le Quatro tempora, jorni santificati! / Li terremuti foro più che quatro settimane; / In loge jacevamo et gran pagura avevane; / Facevamo penitentia la sera et la demane; / Tucti frustando giannose con li scuriati in mane. / Foro facte multe paci de inimistati granni / Ché guerra avevamo avuta et stati con multi affandi; / Quando fo questa cosa se tu me ne domanni, / Correa mille trecento quindici o sidici anni.

There is a passing reference to the 1315 earthquakes in a short 15th century anonymous chronicle (*Cronachetta anonima*) from the L'Aquila area, published by Pansa (1902, p.4). Buccio di Ranallo seems to be uncertain as to whether the earthquake occurred in 1315 or 1316, but since he states that the principal shock occurred on Wednesday, 3 December, the correct year must be 1315. The "*Quattro Tempora*" were periods of fasting established by the Church to sanctify the four seasons of the year. They were observed on Wednesday, Friday and Saturday. In this case, reference is to the winter *Tempora*, observed after the feast of St. Lucy, on 17, 19 and 20 December. Buccio di Ranallo goes on to describe the devotional aspects of public reaction to the earthquake. There is evidence of processions and public penance at L'Aquila. In an effort to bring the shocks to an end, the commune made a vow to build a church in honour of St. Thomas, but it never materialised.

Negative sources

It is a pity that we have been unable to establish whether or not the earthquake was felt in Rome, for that would have helped locate the earthquake epicentre, since earthquakes generated in the Abruzzo Apennines are strongly felt in Rome. But such was the situation at the time that no 14th century Roman narrative sources have survived in which information about the year 1315 can be found. In addition to this lack of narrative sources, our research revealed gaps in administrative sources, resulting from the institutional instability in Rome at the time. For it must be remembered that all papal documentation and chronicle material is of limited use for 1315, because the popes had by that time already been resident at Avignon for six years. Furthermore, 1315 was a particularly problematic year, since the papal throne was vacant from 1314 until 1316, when John XXII was elected pope at the end of the Carpentras conclave. Research was also carried out for the Latium region and other parts of Abruzzo, but without any positive results (Guidoboni and Ferrari 1994).

▲ 1315 12 03 ★ = 42 17 13 32 I₀ = IX? M_c = 6.0

localities	lat.	long.	I	localities	lat.	long.	I
Castles of Aquilano	42 17	13 32	IX-X	L'Aquila	42 21	13 24	VIII

< 169 > **c.1321 Thebes [Greece]**

source Jord. Sévérac, *Mirab.*, p.109
catalogue d. *Papazachos and Papazachou (1997)

In 1321 Thebes was struck by a sequence of strong earthquakes which caused houses and the city walls to collapse. The source is Jordanus of Sévérac. He was a friar in the Order of Preachers, and was at Thebes when the earthquake occurred:

"I was at Thebes, where there are so many earthquakes that nobody could believe it who has not felt them; for it will happen five, six or seven times in twenty-four hours, very frequently, that the strongest houses and walls are reduced to ruins by earthquakes".

Thebis fui, ubi sunt tot terrae motus quod non possent credere nisi qui expertus est; nam quinque vel sex et septem vicibus, inter diem et noctem, sunt, ita quod, propter terrae motus, multotiens et frequenter cadunt et ruunt fortissimae domus et muri.

Papazachos and Papazachou (1997, p.192) give this earthquake an intensity of grade VIII MM.

▲ c.1321 cumulative effects

localities	lat.	long.	I
Thebes	38 20	23 19	IX

< 170 > **1322 January 20 - February 18 [Muharram 722 H.] Damascus [Syria]**

source al-Suyuti, *Kashf*, p.55
literature Taher (1979)
catalogues p. Poirier and Taher (1980); al-Hakeem (1988)

In the month of *Muharram* in the year of the Hegira 722, which corresponds to the period 20 January - 18 February 1322, there was a strong earthquake at Damascus, but no damage is recorded.

The earthquake is recorded in a reliable work by al-Suyuti (1445-1505): "In the month of *Muharram* there was an earthquake during the night at Damascus which caused the earth to shake violently; then the shocks ceased by the will of God".

في المحرم جاءت زلزلة بدمشق ليلا وهزت الأرض هزة عظيمة شمم مكنت بإذن الله تعالى.

Poirier and Taher (1980, p.2193) give this earthquake an intensity of grade VII MM; al-Hakeem's assessment (1988, p.22) is grade VIII MM.

▲ 1322.01 20 - 02 18 [Muharram 722 H.]

localities	lat.	long.	I
Damascus	33 30	36 19	VI?

< 171 > **1323 February 25 Bologna [northern Italy]**

source 1 Bonif. Morano, *Chron.*, p.142
source 2 Ghirardacci (1596-1657), II, p.40
historiography Muzzi (1840-46); Guidicini (1872); Dondi (1896); Meluzzi (1972)
literature Camassi and Molin (1994); Guidoboni (1997); Guidoboni and Ciuccarelli (2003a)
catalogues d. Bonito (1691); Baratta (1901); Milne (1911); *Boschi *et al.* (1997, 2000)
catalogues p. Giorgetti and Iaccarino (1971); Carrozzo *et al.* (1973); Postpischl (1985); CPTI (1999)

On 25 February 1323, at about 19:00 UT (between the first and second hours of the night, "Italian time"), Bologna was struck by an earthquake which was described as "very great" (*grandissimo*), but whose effects are not known in detail. The earthquake was also felt at Modena, but did not cause any damage there.

The effects of the earthquake in Modena are recorded in the contemporary *Chronicon Mutinense* by Bonifacio da Morano, a notary and judge:

"In the same year [1323] the coinage of Modena was created, and on 25 February, during the first hour of the night, the earth shook in an amazing way".

Eodem anno moneta mutinensis facta fuit et die XXV Februarii in prima hora noctis terra mirabiliter mota exititit.

No local chronicle of the period or the following century in Bologna, Ferrara or Mantua mentions the earthquake. The only positive item of information concerning Bologna is to be found in the *Historia di Bologna* by the Augustinian monk Cherubino Ghirardacci, a reliable 16th century Bolognese scholar and historian, whose sources were independent of Bonifacio da Morano, but whose indication of the time when the earthquake occurred coincides with that provided by the *Chronicon Mutinense*, except for a slight difference in the hour (the second hour of the night, "Italian time"):

"On 25 February [1323], a Friday, there was a very great earthquake at Bologna during the second hour of the night".

Alli 25. di Febraro il Venerdì nella seconda hora della notte, in Bologna fù grandissimo terremoto.

25 February was indeed a Friday in 1323.

There is no mention of the earthquake in the substantial body of documents produced at the time by the city authorities of Bologna (now preserved in the Archivio di Stato in Bologna in the collection entitled *Comune, Governo*). This means that the earthquake of 25 February 1323 cannot have had a substantial social impact, either as regards damage to public and private buildings, or in relation to the economic life of the city.

That the authorities were concerned to keep the city's public and church buildings in sound condition is confirmed by enactments made by the *Consiglio del popolo* between January 1322 and January 1323 for the renovation of the commune's *palazzo vecchio*, and for the provision of funds for the restoration of church buildings, to be made available to the clergy if they were not in a position to provide from their own finances. The fact that no such enactments were made after the earthquake, suggests that if there was any damage, it must have been slight. It has also been shown that there is no truth in the suggestion made in some local histories (Guidicini 1872; Meluzzi 1972) that the church of Ss. Simone e Giuda was damaged.

▲ 1323 02 25 19:00 UT

localities	lat.	long.	I	localities	lat.	long.	I
Bologna	44 30	11 20	V-VI	Modena	44 39	10 56	V

< 172 > 1327 May 12 Lopadium? [north-western Turkey]

source *Chron. min. Byz.* 8.17 (in Schreiner 1975, p.78)

historiography Schreiner (1977)

catalogues of Ambraseys and Finkel (1991); Evangelatou-Notara (1993); *Papazachos and Papazachou (1997)

On 12 May 1327, an earthquake described as "great" in the sources may have struck the town of Lopadium (present-day Uluabat) in Bithynia, but its effects are not specified.

Information about the earthquake is to be found in what is known as the *Short Chronicle of 1352* or *Reichschronik 8* (published in Schreiner 1975):

"On 12 May in the tenth indiction [1 September 1326 – 31 August 1327], on the third day [Tuesday], at the third hour of the night, there was a great earthquake, and on the following day the Mussulmans took Lopadium".

μαίω ιβ', ἰνδικτιῶνος ι', ἡμέρα γ', ὥρα γ' τῆς νυκτός, ἐγένετο σεισμός μέγας καὶ τῆ ἐπαύριον παρέλαβον οἱ Μουσουλμάνοι τὸ Λοπάδιον.

In 1327, 12 May was indeed a Tuesday.

Since the earthquake is referred to in the context of the capture of Lopadium in Bithynia by the Turks, it seems likely to have occurred in that region. Schreiner (1977, pp.232-3) is drawing roughly the same conclusion when he places the earthquake in western Anatolia.

▲ 1327 05 12 19:45 UT

localities	lat.	long.	I
■ Uluabat	40 12	28 26	VII?

< 173 > 1328 December 4 Valnerina [central Italy]

- sources 1 {manuscripts} JNULJerusalem, Heb.8.o 4281, Moscs ben Daniel, *Book of Prayers*, 1391, fol.389v; Bonav. Benv., *Cron.*, p.25; *Ann. Arretin. min.*, p.44; Villani G., *Nuova cron.*, II, p.663; Giov. Bazz., *Chron.*, p.98; *Ann. e cron. Perugia*, p.221
- sources 2 BNCFlorence, *Magliabechiano*, VIII, 1488, *Ricordi*, fol.95r; BAVat., *Barb. Lat.*, 324 [Paolo Rocchi], *Terraemotus...* 1599; BAVat., *Vat. Lat.*, 7934 [Paolo Rocchi], *Narratio Terraemotus...* 1599; Mar. Moro, *Mem.*, p.80; *Cron. sen. magg.*, p.482; Nicolò Ferr., *Polyhist.*, col.749; *Cron. Varign.*, II, p.410; *Cron. città di Perugia*, p.101; Ghirardacci (1596-1657), II, p.87
- historiography Pellini (ed. 1664); Muratori (1762-64); Baglivi (1754); Moroni (1840-79); Patrizi-Forti (1869); Conti (1872); Sansi (1879-84); Franceschini (1913); Grohmann (1981); Cordella (1995)
- literature Busi (1995); Castelli *et al.* (1997); Boschi *et al.* (1998)
- catalogues d. Bonito (1691); von Hoff (1840); Perrey (1848); Mallet (1853); Mercalli (1883); Taramelli (1896); Baratta (1899, 1901); Milne (1911); *Conversini *et al.* (1990); *Boschi *et al.* (1995, 1997, 2000)
- catalogues p. Giorgetti and Iaccarino (1971); Carrozzo *et al.* (1973); Postpischl (1985); CPTI (1999)

The earthquake of 4 December 1328 occurred towards dawn, that is to say at about 6:15 UT, and it struck the territory of the Duchy of Spoleto and the *Marca* of Ancona, which now form part of the Marche and Umbria regions. The most serious damage affected the hilly area to the west of the Sibillini Mountains, in the valley of the river Nera.

Particularly serious damage occurred at Norcia, where houses, towers, part of the town walls, *palazzi* and churches collapsed. There were very serious collapses at Montesanto and Preci, and all the inhabitants of the latter place were killed. At Castel San Giovanni, the earthquake destroyed (*dirupavit*) most of the houses and other buildings; parts of Cerreto di Spoleto and Monte San Martino collapsed (all the above places are in the present-day province of Perugia), as did part of Visso (in the province of Macerata). Spoleto was also affected, many houses collapsing there (*corrueverunt*). The earthquake was strongly felt at Ripatransone (in the province of Ascoli Piceno), where house walls and the floors shook violently. The earthquake was felt at Foligno and in Rome.

The earthquake is recorded in various reliable sources, two of which were written by eye-witnesses. These are the chronicle of Bonaventura di Benvenuto, a notary who lived at Foligno in the late 13th and the first half of the 14th century, and a long mem-

oir in Hebrew to be found in a book of prayers by Moses ben Daniel, a member of the Jewish community in the ancient town of Ripatransone (called *La Ripa* in the text), situated in the *Marca* of Ancona. The manuscript is in the Jewish National and University Library in Jerusalem. It tells of the effects of the earthquake at Ripatransone, and records the first reports to reach there of the serious destruction at Norcia. These reports were confirmed at a later stage by refugees from Norcia who sought safety at Ripatransone; and the author of the manuscript later went to Norcia himself, obtaining personal confirmation of what he had been told.

These two sources enable us to date the earthquake accurately, for Bonaventura di Benvenuto tells us that the shocks began on 4 December 1328, towards dawn (*circa auroram*), and this agrees with Moses ben Daniel's comment that he first noticed shaking in the early morning, shortly before sunrise. This makes it possible for us to correct the date of the earthquake, which is given as 1 December 1328 in Postpischl (1985) on the basis of Baratta (1901), who follows Baglivi (1754).

Bonaventura di Benvenuto writes:

"1328 [...] and in the following month of December, there were many earthquakes, which caused great harm to the people of Norcia, and they began on the fourth day of that month towards dawn, and lasted for months".

MCCCXXVIII. [...] et de mense decembris sequentis fuerunt multi terremotus, ex quibus Nursini magnum receperunt dampnum, et incepterunt die quarta dicti mensis de mane circa auroram et duraverunt per menses.

Moses ben Daniel's text records:

"A great earthquake the like of which has not happened since the days of Uzziah king of Judah

On the first day of the month of Tevet, the year 5089 of the Creation [4 December 1328], and we were in the city of La Ripa in the province of the *Marca* and there was a great earthquake soon after dawn. 'And the foundations of the walls shook' [Isaiah 6, 4] from the heaviness of the earthquake, and the floor of the house shook like a hut, the barrels moved in the cellar and hit one another and the wine inside them resounded like a bell. And I was lying on my bed because the east had not yet lightened. The strength of the earthquake that day affected an area greater than three miles. That day the earthquake was felt strongly in Norcia in the province of the Duchy near Spoleto and we were told that a griveous thing came to pass that houses have fallen and courtyards were destroyed and there was a great killing when the towers collapsed and there was a great disturbance among the people everywhere. There were many dead bodies and there was no end to the corpses 'Through the wrath of the Lord of Hosts the land is burned' [Isaiah 9, 19] and from that earthquake seven souls died from among the Jews, five of them the sons of the same mother, 'She who bore seven has languished; she has swooned away' [Jeremiah 15, 9] and one son escaped for being in Rome and a daughter they took out of the ruins. And in those days people came from Norcia that was turned upside down in an instant, and they told us what their eyes had seen, that the houses fell down and the courtyards were destroyed and even the city wall was partly destroyed. In short, no house remained standing in the city due to the strength of the earthquake. And there is no house that does not have a dead person. And at that time the number of victims became known and there were more than two thousand souls among the men, the children and the women, and only few young boys and girls remained, for some of the men and the women ran away [from their houses] completely naked. On that day and at that hour there as a great earthquake in all the cities of the *Marca* and Duchy and in Rome and possibly in all the world. And on that day houses fell in other known cities. Later I came to Norcia and it was just as I have heard. After that the survivors got up and rebuilt the city and constructed houses and settled in them and put up the city's ruins, restoring

them to better condition than they had been in days of old. And those were the days of 'misericordia' among the gentiles who are going about crying and weeping, bare shouldered and scourging themselves, and their children walking beside them, crying loudly, and the rain and snow fell upon them from the sky as it is the autumn season. And the snow was about two *ammass* [80 centimetres] high on the ground and the weather is growing stormy. After that many days of quakes, 'praise is due to Him for silence, glory' [Psalms, 65, 2]. And that was the year 89 of the sixth millennium under the sign 'In the days when the judges ruled there was a famine in the land' [Ruth 1, 1] as there was famine everywhere, in the Marche and Lo Ducato and the kingdom of Puglia.

[intercalated with the writing on the margins] In Rome and in the [lands of] Patrimony [of St. Peter] and in the kingdom of Puglia there is a great and terrible famine the such has not been seen since the days of our forefathers. And in the year '90 of the sixth millenium [1329] the famine spread and it caused the "dogale" of the vicar at Rome (the pope) to reach nine [...] and it was found with great difficulty [...] in some cities of the *Marcha* about nine [...] and in the Duchy and the kingdom [...] [end of intercalation] and the kingdom of Puglia the cost was high and in the city of Viterbo it cost much because an army of the Romans came there and some of its people left it because of the heavy famine and in those days it was written that a thousand and four hundred people of Viterbo died in Santo Spirito of Rome alone. And in all cities we know about there was a great famine. And there never was the like of that quake and that famine 'The Lord became jealous for his people and had pity on its poverty' [phrased on Joel 2, 18]. Praise the terrible king who has the force and the might and He shall be a refuge to his people and a hiding place as it is said 'the Lord is a refuge to his people, a stronghold to the people of Israel' [Joel 3, 16]. Amen".

רעש גדול מאד אשר כמוהו לא נהיה מימי עוזיה מלך יהודה
באחד בשבת בראש חודש טבת שנת הפ"ט ליצירה ואנחנו בכרך לריפא אשר בגלילות המרקא ויהי רעש גדול תכף לעלות
השחר וינעו אמות [ישעיהו ו, ד] הקירות מכובד הרעש וקרקע הבית התנועע כמלונה הבית המרתף דא לדא נקשן היין
מקשקש בתוכם כפעמון ואני הייתי שוכב על משתי כי עדיין לא האיר המזרח ושיעור הרעש היה כשיעור מהלך שליש מיל
ביום ההוא עצם הרעש בכרך נורשי אשר בגליל הדוקטו קרובה לאספוליטי וחזות קשה הוגד לנו כי נפלו הבתים ונהרסו
החצירות והיה הרג גדול בנפול המגדלים והיתה מהומה גדולה בעם רב הפגר בכל מקום אין קצה לגויה "בעברת ה' צבאות
נעתם ארץ" [ישעיהו ט, יח] ומהו מן הרעש ההוא בבית אחת שבע נפשות מהיהודים, החמש מהם בני אם אחת, "אומללה
יולדת השבעה נפתה נפש" [ירמיה טו, ט] ונמלט לה בן אחד שהיה לה ברומא וכת אחת שהוצאה מתחת המפלות. בימים
ההם באו אנשים מכרך נורשי ההפוכה כמו רגע ויגידו לנו את אשר ראו עיניהם כי נפלו הבתים ונהרסו החצירות וגם חומת
העיר נפלה קצתה סוף דבר לא נשאר בעיר בית אשר לא נהרס מכובד הרעש ואין בית אשר אין שם מת. כעת ההיא בא מספר
ההרוגים והיו יותר מאלפים נפש בין הגברים והטף והנשים, ולא נותרו שם ילדים וילדות כי אם מתי מספר כי מקצת הגברים
והנשים נסו חוצה עירום ועריה ביום ההוא ובשעה ההיא נהיה הרעש בכלל ככל ערי המרקא והדוקטו וגם ברומא ואיפשר כי
היה כללי בכל העולם. גם נפלו מן הבתים ביום ההוא בארצות ידועות. אחרי כן הייתי בנורשא וכאשר שמעתי כן ראיתי אחרי
כן קמו השרידים ובנו העיר על תילה ובנו בתים וישבו הריסותיה הקימו ותיקנום יותר מאשר היו מימי קדם בימים ההם
נעשית המיסריקורדייא בין הערילים הולכים וצועקים ובוכים תלושי כתף ומכים על מתניהם גם טפיהם ילך עמהם הלוך
וגעו והגשם והשלג יורד עליהם מן השמים כי אז זמן הסתיו והשלג כאמתים על פני הארץ כי הזמן הולך וסוער עליהם אחר
כן ימים רבים ברעשים יתב" אשר לו דומייה תהלה" [תהלים, סה, ב] השנה ההיא היתה שנת פ"ט לאלף השישי סיגנה "ויהי
בימי שפ"ט' השופטים ויהי רעב בארץ" [רות א, א] כי היה רעב גדול בכל העולם הן במרקא הן בלו דוקטו [תוספת, שוליים
ימין] הן ברומא ופטרימוניאו ובמלכות פולייא רעב גדול כבד מאד אשר כמוהו לא נהיה מימות אבותינו. ויהי בשנת צ' לאלף
השישי וירחק הרעב עד היות הדוגלי מן המשנה ברומא כתשעה ליט' ונמצא בקושי גדול וכן מקצת ארצות המרקא כתשעה
ליט' וכן בלו דוקטו ובמלכות [סיום התוספת] ובמלכות פולייא היה יותר יקר ובעיר ביטרבו יקר ה... אמנם כי היה שם חיל
מן הרומנים ומקצת אנשיה ירדו מתוכה מכובד הרעב. בימים ההם נמצא כתוב כי מתו מן הביטרביסי אלה וארבע מאות בעל
ספיריטו מרומא לבד ובכל הארצות אשר שמענו שמעם היה רעב גדול יתר מאוד וכרעש ההוא וכרעב ההוא לא נהיה וכמותו
לא יוסיף כי יקנא ה' לעמו ועניו ירחם [ב, יח] יתב' המלך הנורא אשר לו העזו והגבורה והוא יהיה לעמו מחסה וסתרה
כאמור וה' מחסה לעמו ומעוז לכני ישראל ...

These two sources were not absorbed into the later historiographical tradition because they did not circulate: the Foligno chronicle because it was linked to a small town, and

רשם גדול אחד אשר נבחר לא עשה מימי עזרא מלך יהודה.

כאשר פשטנו נראה שמה שכתב לענין זה ודומה נכרך להיטא אשר בגלגלות המדקא וכן רשמו
גדול הבנה לעולם השמימי ויטען אמונת הקירות שטובב הרעש וקרקע הבית הרבועה כשלושה חביות
המקרא דא לא נקטן היין מקטקט נגננת כשמוין ודע הייה שוכב על מטתו כי עדין לא האד
המקרא ושיעור הרעש היה כשיעור מנהלך שלש מיל' כיום ההוא עכש הרעש נכרך ערשי אשר
בגלגל ההקטן קומנה לאספולטי ומזוה קשה הונר לא כי עפלו התים יעברסו החכירות והההין
גדול כנפול השגרים והייה מהומה גדולה נגס רב הפגז כבלמקום אין קנה לגייה כעבודת
ה עבאיה נגהב ארץ ומתן מן הרעש ההוא נבוי אמה שבע עשרה מיהודים החמס מהכ
בני אש אמה אומללה יולדת הטבעה נפחה נפחה ונמלט לה כן אחר שהיה לה נרמיה
וכה אמת שהו כמה מהמה המעלה במידים החס באו אנשים מנכר ערשי ההפכה נמוך
ויחדו לע את אשר דאו עיניהם כי נפלו הברים גהרסו החכירות וקם חומת חעיר נפלה קנה

fig. 75 Detail of the *Book of prayers* of Moses ben Daniel (14th c.), containing a record of effects of the earthquake of 1328 at Norcia and Ripatransone (Jewish National and University Library of Jerusalem, Heb. 8.o 4281).

the Moses ben Daniel evidence because it was in a private document. But there are reports of the earthquake in other sources of the time, namely the anonymous *Annales Arretinorum Minores*, the chronicle of Giovanni Villani and the *Chronicon Mutinense* by Giovanni da Bazzano (a notary who died about 1363/64). Villani, who died of the plague in 1348, provides us with our richest source of information about this earthquake, and it is to him that we owe the identification of six of the places affected. Villani writes:

"How a large part of the town of Norcia in the Duchy [of Spoleto] was reduced to ruins by earthquakes, together with many castles in the surroundings.

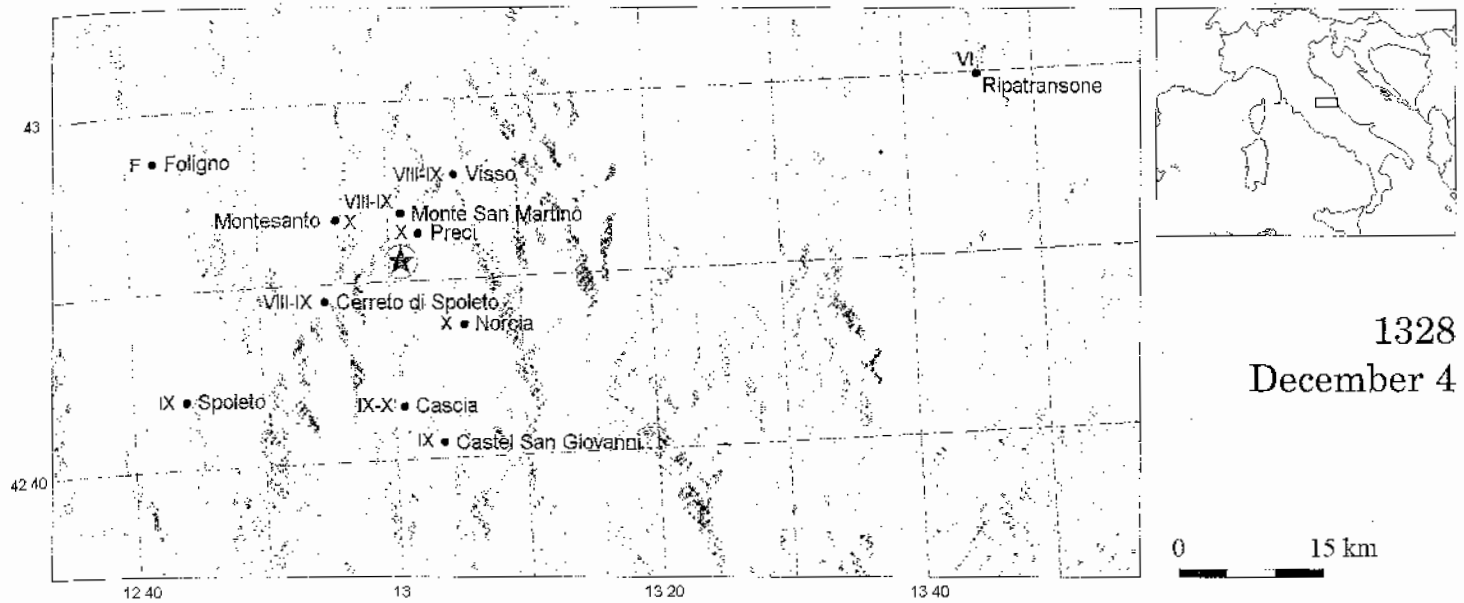
In the said year 1328, at the beginning of December, there were various earthquakes in the *Marca* [of Ancona] in the area around Norcia, with the result that something approaching the greater part of the said town of Norcia was reduced to ruins, and the town walls collapsed, together with towers, houses, *palazzi* and churches, and more than 5,000 people died in the disaster, because it was sudden and occurred during the night. And similarly a castle near Norcia, called Le Precchie [Preci], was reduced to ruins, and no person or animal remained alive there; and the same thing happened at the castle of Montesanto, and part of Monte Sammartino, Cerreto and the castle of Visso".

Come sobissò per tremuoti gran parte de la città di Norcia del Ducato con più castella ivi intorno. Nel detto anno MCCCXXVIII, a l'entrante di dicembre, furono diversi tremuoti ne la Marca ne le contrade di Norcia, per modo che quasi la maggior parte del la detta città di Norcia sobissò, e caddono le mura del la città e le torri, case, e palazzi, e chiese, e de la detta rovina, perché fu sùbita [improvvisa] e di notte, morirono più di V M persone. E per simile modo rovinò uno castello presso a Norcia, chè si chiama le Precchie, che non vi rimase persona né animale vivo; e per simile modo il castello di Montesanto, e parte di Monte Sammartino, e di Cerreto, e del castello di Visso.

Villani's dating of the earthquake to the beginning of December (*a l'entrante di dicembre, di notte*) is slightly less precise than that of Bonaventura di Benvenuto, mentioned above. The *Annales Arretinorum Minores* and the *Chronicon Mutinense* by Giovanni da Bazzano, who simply dates the earthquake to 1329, provide extra detail by mentioning Spoleto and Castel San Giovanni, which are not recorded by Villani.

The *Annales Arretinorum minores* records:

"1328. [...] Great earthquakes in the month of December, principally at Spoleto, where many houses collapsed and men and animals died".



1328
December 4

fig. 76

1328. [...] *Terremotus magni de mense decembris et maxime Spoleti, quibus multe domus corruerunt et homines et bestie periere.*

Giovanni da Bazzano writes:

“At that time [1329] there were great earthquakes, with the result that all the houses and other buildings at Norcia in the Duchy were destroyed, and more than 4,000 people died, and it also destroyed many of the houses and other buildings in nearby Castel San Giovanni”.

Dicto tempore fuerunt terraemotus magni, ita quod terra Norsiae de Ducatu in totum domibus et edificiis fuit dirupata et mortui [sunt] ibidem ultra quatuor milia personarum et eciam Castrum Sancti Iohannis in partibus illis pro magna parte domibus et edificiis dirupavit.

Information similar to that provided by Villani (it may in fact derive from him) is to be found in the *Polyhistoria* of Nicolò da Ferrara, which was wrongly attributed to Bartolomeo da Ferrara. The links between later sources underline the influence of Giovanni Villani on important urban chronicles of the 14th century, such as the *Cronaca senese detta la cronaca maggiore* (wrongly attributed to Agnolo di Tura del Grasso), and the 15th century, such the Bolognese *Cronaca Varignana*. This influence persists into the historiography of later centuries.

The earthquake is reported in general terms in 14th-16th century vernacular chronicles from Perugia, namely the *Annali e cronaca di Perugia in volgare dal 1191 al 1336*, the *Memorie di Perugia* by Mariano del Moro and the *Cronaca della città di Perugia* known as Graziani's diary. They all provide similar information, mentioning only the town of Norcia by name, and they differ from Villani as to the number of victims, since the figure they give for deaths at Norcia is two thousand (or two hundred, perhaps as a result of manuscript copying errors), whereas Villani gives five thousand — perhaps for the whole area. They thus appear to belong to a separate local tradition. The *Annali e cronaca di Perugia* are written in a somewhat corrupt and dialectal Italian vernacular:

“In this year [1328], in the months of November and December, there were many earthquakes in the lands. Norcia was reduced to ruins as were many other castles and many mountains. And it was said that more than two thousand people died there.

And [the inhabitants] of many towns and castles went out into the fields for fear of these earthquakes”.

In quisto millesimo [MCCCXXVij], del mese de novembre e di deciembre, fuoro molte taramuotogle per le contrade. Ennabisòse Norscie e molte altre castelgle e molte montangne; e si se disse che cie moriero più de doi milia persone. E molte citade e castella usciero a campo per paura del ditte taramuotogle.

The 14th century sources differ as to the number of deaths in Norcia and its territory. Moses ben Daniel writes of more than 2,000 dead, and refers specifically to the death of 7 Jews. Giovanni Villani records more than 5,000 victims, Giovanni da Bazzano gives more than 4,000, and the *Annali e cronaca di Perugia* maintain that there were more than 2,000, whereas the later *Cronaca della città di Perugia*, known as Graziani's diary, suggests only 200 (perhaps as a result of errors occurring when the manuscripts were copied). In his *Memorie di Perugia*, Mariano del Moro simply writes that there were many victims. The disagreement as to the number of victims at Norcia may perhaps be partly the result of the sources attributing to the best known town involved the total number of earthquake victims for the whole area. According to Villani, all the inhabitants of Preci died (but the actual number is not specified). According to the *Annales Arretinorum Minores*, there were some deaths at Spoleto as well (but the number is not given). The town of Cascia (in the province of Perugia) is not mentioned in the above sources, but there is an interesting item of information about it in an unpublished report, written in January 1600, concerning the earthquake of November 1599. A local historian named Franceschini (1913) attributes it to Paolo Rocchi, and there are two known copies in the Vatican Library (*Barberiniani Latini*, 324; *Vaticani Latini*, 7934). This report states that the inhabitants of Norcia celebrated the feast of St. Barbara on 4 December to commemorate a violent earthquake which had struck the town 270 years earlier, that is to say about 1329. This is confirmation that the 1328 earthquake was a very important event in the history of the town. The study by Castelli *et al.* (1997, p.22) mentions a parchment preserved in the local history archives at Sellano (*Pergamene*, no.20) which records that on 11 January 1329 the town council of Montesanto (which we know from Villani to have been seriously damaged in the earthquake) met in a house or hut there. This is an indication, perhaps, that the town hall, where the local council as well as that of the neighbouring village of Sellano normally met, was not available. The document also seems to suggest that Sellano either did not possess suitable premises, or did not have any available because it too had been struck by the earthquake.

▲ 1328 12 04 6:15 UT ★ = 42 51 13 01 I₀ = X Me = 6.4 Sites: 12

localities	lat.	long.	I	localities	lat.	long.	I
Montesanto	42 54	12 56	X	Cerreto di Spoleto	42 49	12 55	VIII-IX
Norcia	42 48	13 06	X	Monte San Martino	42 54	13 01	VIII-IX
Preci	42 53	13 02	X	Visso	42 56	13 05	VIII-IX
Cascia	42 43	13 01	IX-X	Ripatransone	43 00	13 46	VI
Castel S. Giovanni	42 41	13 04	IX	Foligno	42 57	12 42	F
Spoleto	42 44	12 44	IX	Rome	41 54	12 29	F

< 174 > 1329 June 28 Ionian Sea – coast of Mascali [eastern Sicily, Italy]
 > tsunami, eruption of Etna volcano <

sources 1 Speciale, *Hist.*, pp.494-6

sources 2 *Fragm. Sic. hist.*, col.1089; *Cronica brevis*, p.60; Ms. M.Finocchiaro, in *Recupero* (1815, p.28)

historiography Arezzo (1537); Selvaggio (1542); Fazello (1558); Maurolico (1562); Omodei (1591); Carrera (1636; 1639-41); Massa (1709); Amico (1740-46); Ferraiù (1974)

literature Guidoboni and Comastri [1994]

catalogues d. Mongitore (1743); von Hoff (1840); Baratta (1901); Carrozzo *et al.* (1973);
Agnello (1992)

catalogues Ts Caputo and Fajta (1984); Tinti and Maramai (1996); Soloviev *et al.* (2000); Tinti (2004)

This tsunami is linked to a violent eruption of Etna volcano and intense seismic activity at the mountain site, but the sources do not allow us to identify the one or more strong shocks. The eruption was a complex phenomenon with effects spread over time. It has been known to seismic catalogues and literature since Mongitore (1743), and has been recorded in erudite Sicilian historiography since Arczzo (1537) to Amico (1740-46). A critical analysis of this eruption has been developed during the research pertaining to the INGV project "Historical Eruptions of Mediterranean Volcanoes from ancient times to the 18th century" (developed by the SGA research group for the historical part).

The tsunami occurred during the first phase of the eruption, beginning on 28 June 1329 at about 18:30 UT ("when the sun was already approaching vespers"), when there was a violent earthquake shock accompanied by loud roaring noises and the appearance of an eruption mouth. There followed a rapid series of shocks, the strongest of which destroyed or damaged a number of unidentified hermit chapels on the eastern and southern slopes of Etna volcano. The tsunami was seen in particular on the shore at a place called Mascali: the sea dragged into the water a number of boats which had been drawn up on the beach. At that time, Mascali was in an elevated position overlooking the Ionian Sea about 20 km east of Etna volcano. The village had a small harbour for fishing boats at the time. Present-day Mascali was built nearer the sea than the old village, which was destroyed in an eruption of Etna volcano in 1928. The primary source for all this information is the *Historia Sicula* by Nicolò Speciale, who lived in the late 13th and early 14th century. He witnessed the eruption and is the only source to record the tsunami as well. Later sources record the volcanic eruption but not the tsunami (*Fragmentum Siculae historiae*, ed. 1738, col.1089; *Cronica brevis*, ed. 1955, p.60; Manuscript M.Finocchiaro, in *Recupero* 1815, p.28). Nicolò Speciale writes:

"On the fire on Mt. Etna.

In the year of Our Lord 1329, on 28 June, when the sun was already approaching vespers, as I recall writing at length in those days, Mount Etna shook violently with tremendous movement and seemed to bellow with a thunderous noise, which not only terrified those who lived on the mountain but also gradually instilled terror into the minds of people living in very many places in Sicily. [...] On the east and south sides of the mountain, where the shaking seemed to predominate, many very old buildings which had been erected in isolated places for the worship of God were either destroyed or split open by a strong earthquake; and quiet streams running down the mountainside were absorbed into the earth. Many boats and craft which had shortly before been hauled up on to the nearby beach of Mascali were carried back into the sea by the violent, powerful earth tremors, and the fishermen were terrified to see them back in the water".

De incendio Montis Aethnae.

Anno Domini MCCCXXIX die vero XXVIII Junii cum sol ad vesperum declinabat, sicut in diebus illis memini prolixus me scripsisse, Mons Aethna horrifico motu vehementer intremuit magnisque videbatur mugire tonitribus, quod non solum incolas montis perterruit, quin etiam passim habitantium plurima loca Siciliae mentibus terrorem incussit. [...] Ab orientali vero, et meridionali parte, ubi montis concussio plus quam in locis aliis videbatur erumpere, plurima edificia, que in eremo veneranda vetustas ad Dei cultum fundaverat, ipse iugis et validus terre motus vel diruit, vel in rimas et fissuras plurimas separavit: placidos etiam rivus aquarum fluentium dehiscens tellus absorpsit. Insufer ad propinqua litora Mascularum scaphas plurimas et pascelos, quas paulo ante subduxerant ex crebris et validis terrae concussionibus in mare deductas, nautae cum terrore maximo et tremore videre natantes.

▲ 1329 06 28

localities	lat.	long.	I	localities	lat.	long.	I
■ Etna volcano	37 45	15 11	VII-VIII ER	Mascahi	37 45	15 11	Ts

< 175 > 1332 January 17 Constantinople [north-western Turkey]

sources 1 Greg., *Hist.*, 9.14, I, p.460; *Chron. min. Byz.*, 8.25, in Schreiner (1975, p.79)

source 2 [Sphr.], *Chron. Maius*, p.176

literature comets: Oppolzer (1887)

historiography Schreiner (1977)

catalogues d. Bonito (1691); von Hoff (1840); Perrey (1850); Dück (1904); Downey (1955); Grumel (1958); Wirth (1966); Ambraseys and Finkel (1991); Evangelatou-Notara (1993); *Papazachos and Papazachou (1997)

catalogues Ts Ambraseys (1962); Antonopoulos (1980); Soloviev *et al.* (2000)

On 17 January 1332, an earthquake was felt at Constantinople. The sources describe it as "great", but its effects are not specified. Information about the earthquake is to be found in Nicephorus Gregoras, a contemporary Byzantine historian, and in what is known as the *Short Chronicle of 1352* or *Reichschronik 8* (published in Schreiner 1975). In dealing with the various omens which foretold the death of the Emperor Andronicus

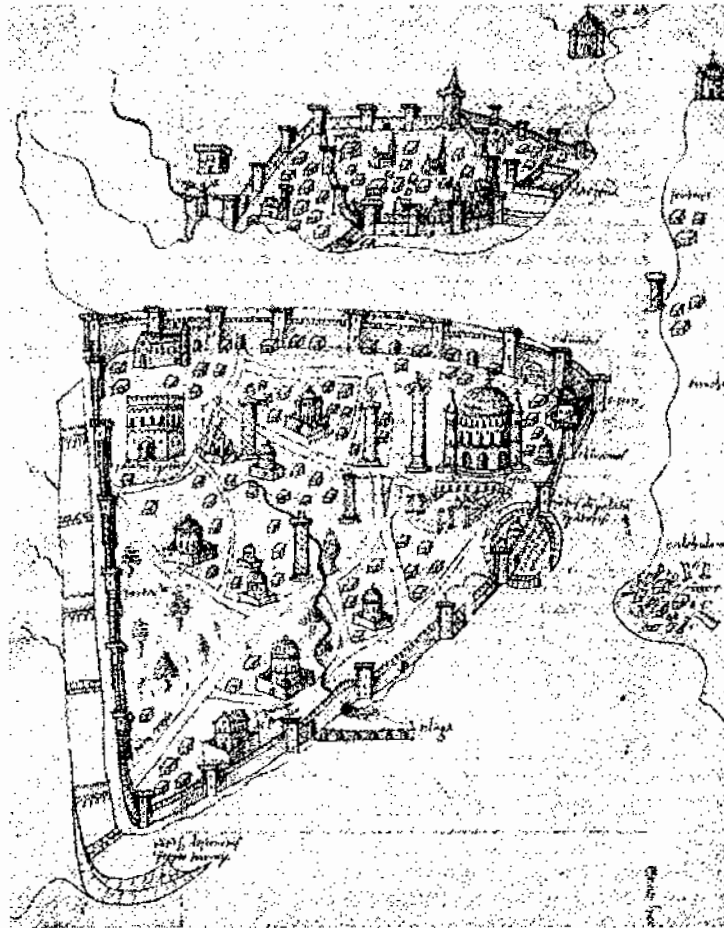


fig. 77 A 15th century plan of Constantinople. Cristoforo Buondelmonti, *Liber insularum arcipelaghi* (Biblioteca Apostolica Vaticana, cod. Rossiano, 702).

II Palaeologus (who was deposed in 1328 and died on 13 February 1332), Nicephorus Gregoras records a solar eclipse, a lunar eclipse, and an earthquake:

"and again there was an earthquake on the evening when Christians celebrate the annual feast of his namesake Antonius [after being deposed, Andronicus had become a monk and taken the name Antonius]".

καὶ ταύτην αὖθις σεισμὸς γῆς ἐν ἑσπέρα, ἢ τὴν μνήμην ἐτέλουν ἐκ χρονικῆς περιόδου χριστιανοὶ τοῦ ὁμωνύμου αὐτῷ Ἀντωνίου.

Nicephorus Gregoras goes on to record a violent storm at sea on 12 February 1332. The eclipse of the sun referred to by Gregoras may be that of 30 November 1331, but it was only visible in Asia (a previous solar eclipse on 16 July 1330 was visible in eastern Anatolia). In this chronological context, the nearest lunar eclipse is that of 15 December 1331 (Oppolzer 1887, pp.244-5 and chart 122 for the eclipse of the sun; p.364 for the eclipse of the moon). The feast of St. Antony was celebrated on 17 January. The work known as the *Short Chronicle of 1352* or *Reichschronik 8* (published in Schreiner 1975) allows us to identify the exact year as 1332, thanks to the indiction number, and confirms the day as the feast of St. Antony, as suggested by Gregoras: "On 17 January in the fifteenth indiction [1 September 1331 – 30 August 1332], at the third hour of the night, there was a great earthquake".

ἰαννουαρίῳ ιζ', ἰνδικτιῶνος ιε', ὥρα γ' τῆς νυκτός, ἐγένετο σεισμὸς μέγας.

The *Chronicon Maius* of Pseudo-Sphrantzes (Greco, p.176) does not supply any further information. The seismic catalogue tradition has dated the earthquake to 11 or 12 February 1332, thereby combining into a single event the earthquake and storm which the sources clearly distinguish between and separate. Grumel (1958, p.481) gives the date 11 February 1332; Perrey (1850, p.19) hesitates between 11 and 12 February 1332; Bonito (1691, pp.542-3), von Hoff (1840, p.229) Antonopoulos (1980, p.188) and Soloviev *et al.* (2000, pp.38-9) date it to 12 February 1332; Dück (1904, p.134) and Papazachos and Papazachou (1997, p.193) give 12 February 1331.

▲ 1332 01 17 18:45 UT

localities	lat.	long.	I
Istanbul	41 02	28 57	F

(176) 1334 December 4 Verona [northern Italy]

sources 1 *Contin. anon. Chron. Veron. Parisii de Cereta*, col.649

sources 2 BCVr, 786, *Cron. Ver.*, fol.48v; Zagata, *Cron.*, (ed. 1745-47), pt.1, p.74

historiography Dalla Corte (1594); Biancolini (1749); Sormani Moretti (1904)

catalogues d. Perrey (1848); Mallet (1853); Goiran (1880); Bettoni (1888); Baratta (1901); Milne (1911);

*Boschi *et al.* (1995, 1997, 2000)

catalogues p. Giorgetti and Iaccarino (1971); Carrozzo *et al.* (1973); Postpischl (1985); CPTI (1999)

On 4 December 1334, an earthquake described as "very strong" (*maximus*) was felt at Verona, but no damage is specifically mentioned, and no effects are known to have occurred in other towns in the Veneto area.

The only contemporary source to record the event is the anonymous continuation of Parisio da Cerea's chronicle of Verona, which reports:

"1334 [...] And in that year on 4 December pope John XXII died at Avignon. And on that day, at that time, there was a very strong earthquake at Verona".

MCCCXXXIV [...] Et eo Anno IV Decembris Dominus Joannes Papa XXII in Avinione mortuus est. Et eo die, et hora fuit Terraemotus maximus Veronae.

There is no mention of the earthquake, however, in other reliable contemporary sources, such as the *Annales Veronenses De Romano* (1259-1306), the *Notae veronenses* (1328-1409) and the *Chronica illorum de la Scala* (823-1341), all of which were published by Cipolla in the collection devoted to *Antiche cronache veronesi* (1890).

The event does appear in the Veronese historiographical tradition. In the 15th century *Cronica di Verona* by Pier Zagata and the anonymous 16th century *Cronica di Verona* (Biblioteca Civica, Verona, *Manoscritti*, 786) it is recorded in very similar terms to those found in the above-mentioned 14th century source. To the bare mention of an earthquake found in the contemporary source, the Veronese historian Dalla Corte (1594) was the first to add the suggestion that many houses collapsed.

Another item of information was added by the 18th century scholar Biancolini (1749), according to whom another shock was felt at Verona on 31 December 1334.

The picture of effects delineated by Dalla Corte and Biancolini became part of the seismological tradition through Goiran (1880) and Bettoni (1888), and penetrated as far as Baratta's catalogue (1901).

In order to improve our state of knowledge, we carried out archive research, but without result. Since the documents of the commune of Verona and of other Veneto towns are largely lost, we also examined church documents (Archivio di Stato, Biblioteca Civica and Biblioteca Capitolare, Verona, and Archivio di Stato, Vicenza).

The fact that chronicle sources for all the rest of the Veneto area are silent on the matter, suggests that the earthquake was both moderate and localised. It also has to be remembered that there was famine and an epidemic in 1334, which may have caused any less than serious effects of the earthquake to be pushed into the background.

▲ 1334 12 04

localities	lat.	long.	I
Verona	45 26	11 00	VI-VIII?

< 177 > 1339 January 13 - February 11 [*Rajab* 739 H.] Tripoli [Lebanon]

source 1 al-Yafi'i, *Mir'at*, IV, p.300

source 2 Ibn al-'Imad, *Shadharat*, VI, p.120

literature Taher (1979)

catalogues d. von Hoff (1840); Mallet (1853); Sieberg (1932a)

catalogues p. Poirier and Taher (1980); al-Hakeem (1988); Bektur and Alpay (1988)

In the month of *Rajab* in the year of the Hegira 739, which corresponds to the period 13 January - 11 February 1339, Tripoli (present-day Tarabulus, in Lebanon) was struck by a strong earthquake which killed 60 people.

The principal source for this earthquake is the contemporary Yemeni Arab historian al-Yafi'i (1300-1367), who records:

"In the month of *Rajab* sixty people died in an earthquake at Tripoli in Syria".

في شهر رجب مات فيها ستون نفسا بالزلزلة في طرابلس الشام.

The report in Ibn al-'Imad (1622-1679), a late source, is almost identical:

"There was an earthquake at Tripoli in Syria, which killed 60 people".

فيها هلك بطرابلس الشام تحت الزلزلة ستون نفسا.

▲ 1339 01 13 - 02 11 [*Rajab* 739 H.]

localities	lat.	long.	I
Tripoli	34 26	35 51	VIII

< 178 > 1343 May 26 - 1344 May 14 [744 H.] Egypt

sources [manuscript] BNFrance, ms. Ar. 1536, Ibn al-Shihna, *Rawd*, fol.63v;
al-Suyuti, *Kashf*, p.55; Ibn Habib, *Tadhkirat*, II, p.58
catalogue d. *Ambraseys *et al.* (1994)

In the year of the Hegira 744, which corresponds to the period 26 May 1343 - 14 May 1344, Egypt was probably struck by a violent earthquake, but its exact effects are not known. The Arab sources for this earthquake record it along with the disastrous earthquake of 3 January 1344 (see the relative entry) which struck northern Syria and central and southern Turkey. In all probability, however, these were two separate events, since the earthquake of 3 January 1344 was slightly felt at Damascus - the most southerly place to be affected. Effects in Syria and Egypt were mistakenly conflated by various Arab historians, starting with Ibn Habib (1310-1377), a Syrian writer at the time. He provides an exact date for the earthquake, placing it in the month of *Sha'ban* in 744, which corresponds to the period 19 December 1343 - 16 January 1344. There is no doubt, however, that this dating applies to the earthquake in Syria and Turkey, as all the sources for that earthquake agree, and so it is preferable to apply a less precise date (744 of the Hegira) for the Egyptian earthquake, as the other sources confirm. It should also be noted that in the catalogue of Ambraseys *et al.* (1994) the seismic event in Egypt is considered doubtful.

Ibn Habib states:

"In the month of *Sha'ban* in this year [744 of the Hegira], there was a violent earthquake which brought trouble, caused panic, affected the whole country and worried the inhabitants, moving fixed objects and destroying buildings, and that is how it affected Egypt and Syria".

وفي شعبان منها كانت الزلزلة العظيمة المزجة المحرجة العميمة التي عمت البلاد وغطت العباد وحركت الساكن وغربت الاماكن دخلت الى مصر والشام

Ibn al-Shihna, a historian who was active in the late 14th and early 15th century, records: "In the year 744 [of the Hegira], there was a violent earthquake in Egypt and Syria and people left for the desert: the earth was shaken by the earthquake and everyone wondered what was happening. I said: flee into the country where you will find that the earth has freed itself of its burdens" [*Kor.* IX, 1-3]).

وفي سنة أربع وأربعين وسبعماية كانت الزلزلة العظيمة بمصر والشام وخرج الناس الى الصحارى وتواترت بعدها زلازل وقال زلزلت الارض بنا زلزالها وقال كل من عليها ما لها فقلت ادبروا الى الصحرى فيها قد اخرجت ارضكم اثنالها.

Finally, al-Suyuti (1445-1505) states:

"There was a violent earthquake in Egypt and Syria. People fled out of the towns into the countryside. The first shock was followed by other shocks".

كانت الزلزلة عظيمة في مصر والشام وخرج الناس الى الصحارى وتواترت بعدها زلازل مرة.

△ There are no elements with which to indicate the parameters.

< 179 > 1343 October 14 Sea of Marmara [Turkey]

< 180 > 1343 October 18 Sea of Marmara ▷ tsunami ◁

< 181 > 1343 November 20 Sea of Marmara

- sources [manuscript] BN Marciana Ve, *Mss. Gr.*, 155, Acindynus, *Farewell*, fol.32v;
 Greg., *Hist.*, 14.2, II, pp.695-6; Madarakis Galaktion, *Notulae*, in Turyn (1981, pp.108-12);
 Malakis, *Notula*, in Darrouzès (1950, p.175); *Notula* in Athenagoras (1935, p.178); *Chron. min. Byz.* 8.39; 9.10; 87.1; 113.1 in Schreiner (1975, pp.83, 93, 612, 681); *Chronicle*, in Mioni (1981, p.80); Acindynus, *Epist.*, p.66; Acindynus, *Refut.*, IV.39.25-6, p.377; Macremb., *Opinions*, in Kourouses (1969-70); Macremb., *Dial.*, p.203; Callistus, in Miklosich and Müller (1860, p.303)
- historiography Shevchenko (1957); Janin (1964); Schreiner (1977); Müller-Wiener (1977); Ducellier (1980)
- literature Taher (1979); Guidoboni and Comastri (2002)
- catalogues d. Perrey (1850); Schmidt (1881); Dück (1904); Sieberg (1932a); Galanopoulos (1955); Grumel (1958); Ambraseys and Finkel (1991); Evangelatou-Notara (1993); *Papazachos and Papazachou (1997)
- catalogues p. Ergin *et al.* (1967); Shebalin *et al.* (1974); Papadopoulos and Chalkis (1984); Papazachos *et al.* (1986); al-Hakeem (1988)
- catalogues Ts Ambraseys (1962); Antonopoulos (1980); Soloviev *et al.* (2000); Ambraseys (2002)

On 18 October 1343, Constantinople and the western area of the Sea of Marmara were struck by two strong earthquakes. The earthquakes were also felt at Lysimachia (present-day Orta Köy) and even beyond the present-day Gallipoli peninsula (the Thracian Chersonese), though less strongly than at Constantinople. These two strong earthquakes on 18 October 1343 were preceded by another on 14 of the same month. Further shocks ensued, including a strong one on 20 November 1343. This sequence lasted for nearly a year, i.e. until the summer of 1344. In Constantinople, part of the Theodosian walls collapsed (they had been built in the first half of the 5th century), and the sea walls were also damaged (Müller-Wiener 1977, p.314). The walls built by the Emperor Constantine (306-337) withstood the shock, however. Towers, palaces and churches collapsed; and the east side of the apse of St.Sophia was also damaged (see also the earthquake of 6 November 1344). Houses as well as vineyard and garden walls also collapsed. The debris which piled up in the streets made it difficult for people to pass by. In the summer of 1344, the Theodosian walls were repaired by Alexius Apocaucus, who had been appointed *megas dux* and was responsible for running the capital and neighbouring islands (Gregoras II, p.711; Shevchenko 1957, p.166; Müller-Wiener 1977, p.294).

Tsunami

A large sea-wave, associated with the second earthquake on 18 October 1343, penetrated a long stretch of low-lying coast to a distance of about 1.8 km (ten stades). Some boats were dragged from the ports or other coastal places where they were lying, and left aground. After a considerable time, the sea receded, leaving mud and dead fish on land. The sources do not tell us exactly where this tsunami occurred. The only geographical information recorded refers to Stauros, north of Chrysoceramus (modern Beylerbey), on the Asian shore of the Bosphorus. Set out below are selected passages, firstly from sources concerning the effects of the various shocks, and then from those concerning the tsunami. They come from Nicephorus Gregoras, a contemporary Byzantine historian, as well as from a number of Byzantine chronicles and *Notulae*.

The historical sources

Nicephorus Gregoras's (II, pp.695-6) account is very detailed as regards the earthquake effects, but less specific about the time when the shocks occurred:

"And at that time there were some violent earthquake and sea-wave shocks at Byzantium and its suburbs [...]. These earthquake shocks began in mid-autumn [1343], when Scorpio was beginning to pass beyond the Sun. And on the first day, God shook the ground twice, with such violence that many people feared for their lives. And palaces collapsed, as well as much of the walls of Byzantium. I scarcely need mention the collapse of vineyard and garden walls, for all were almost completely destroyed.

People could not easily pass along the streets for the piles of debris. [He goes on to describe the tsunami: see below for the actual text]. The earthquake was then felt as far away as Lysimachia, and briefly beyond the [Thracian] Chersonese, but not as strongly. And with Byzantium as its root, so to speak, or its point of departure, it very gradually spread, decreasing in intensity as it went, and transmitting the force of the shock to towns and countryside in proportion to the distance covered. And it lasted until the summer [of 1344], day and night, being felt sometimes with more and sometimes with less intensity”.

Κατὰ δὲ τοῦτον τὸν χρόνον ἐξαίσιοι τινες ἀνεῤῥώγεσαν κατὰ Βυζαντίου καὶ τῶν αὐτοῦ προαστείων σεισμοὶ καὶ βρασμοὶ θαλάττιοι [...] ἀρξασθαί μέντοι συνέβη τοὺς τοιοῦτους σεισμοὺς καὶ κλόνους τῆς γῆς ἐν μέσῳ που τῷ φθινοπώρῳ, ἄρτι τοῦ ἡλίου τὰ τοῦ σκορπίου προοίμια παραλλάττοντος. καὶ τὴν μὴν πρώτην ἡμέραν δις ἐτίναξε τὴν γῆν ὁ θεός. οὕτω γε μὴν ἐμβριθῶς, ὡς ἀπογνῶναι τοὺς πλείστους τὸ ζῆν ὑπὸ δέους· οἰκίας τε καταπεσεῖν ἐγεγόνει καὶ τὰ πλείστα τῶν τοῦ Βυζαντίου τειχῶν. ἀμπέλων δὲ φραγμοὺς καὶ κήπων περιβόλους οὐδὲ μεμνησθαι χρή. πάντες γὰρ μικροῦ κατεῤῥήφισαν ἄχρι κρηπίδων· ὡς δυσπρόσοδον γίνεσθαι πᾶσαν ἀγυιᾶν τοῖς παριοῦσι, σωρηδὸν ἐρριμμένων τῶν ἐντεῦθεν ἐρειπίων. [...] Αἰσθησιν μέντοι τοῦ τοιοῦτου γενέσθαι φασὶ τιναγμοῦ καὶ σεισμοῦ μέχρι Λυσιμαχίας, καὶ βραχὺ τι Χερρόνησου ἐπέκεινα. ἤκιστα δ' οὖν τὸν ἴσον γε τρόπον· ἀλλ' ὥσπερ ἐξ ὀρμητηρίου καὶ ρίζης τινὸς ἀρξάμενον τοῦ Βυζαντίου ἡρέμα καὶ κατὰ βραχὺ προϊόντα τε ἐκδιδόναι καὶ ὑφειμένως βαδίζουσιν κατὰ τὸ ἀνάλογον αἰεὶ ταῖς ἐφεξῆς παραπέμπειν χώραις καὶ πόλεσι τὴν τοῦ κλόνου συνάφειαν· παραμεῖναι δ' ἄχρι καὶ αὐτοῦ γε τοῦ θέρους ἐφ' ἡμέρα καὶ νυκτὶ, μείζω τε καὶ ἐλάττω τὴν αἰσθησιν παρεχόμενον.

Gregoras goes on to deal with the shocks in the autumn of 1344 (see the next entry). The numerous *Notulae* and Byzantine chronicles mentioned below make it possible to establish the seismic sequence of October-November 1343 fairly accurately.

In what is known as the *Short Chronicle of 1352*, or *Reichschronik 8* (published in Schreiner 1975, no.8.39, p.83), we read:

“On 18 October in the eleventh indiction in the year 6851 [1 September 1342 – 31 August 1343], during a great disturbance, and when many excommunications had been pronounced by the patriarch John, a great earthquake occurred in the morning; and late in the day there was another [earthquake] such as had never been felt before. The shocks lasted for a long time, and both houses and city walls [in Constantinople] collapsed”.

ὀκτωβρίῳ ἡ', ἰνδικτιῶνος ια', τοῦ ρωνα' ἔτους, ζάλης οὐσης πολλῆς καὶ ἀφορισμῶν πολλῶν τεθέντων παρὰ τοῦ πατριάρχου κυροῦ Ἰωάννου, ἐγένετο σεισμὸς μέγας τὸ πρῶν. καὶ ἀργὰ ἕτερος οἶος οὐκ ἐγένετο πώποτε. ἔσειε δὲ καιρὸν πολὺν καὶ ἐπεσον καὶ τείχη τῆς Πόλεως καὶ οἰκίαι πολλαί.

The date of the earthquake given in this chronicle differs by one year (1342 instead of 1343) from nearly all the other sources.

The chronicle in manuscript *Marcianus graecus 595* (published in Mioni 1981) records similar but briefer information at fol.207:

“In the month of October in the year 6852 [1343], there was a great earthquake and the walls of the City [of Constantinople] collapsed.

Μηνὶ ὀκτωβρίῳ ἔτους ρωνβ' ἐγένετο σεισμὸς μέγας καὶ ἐχαλάσθησαν τὰ τείχη τῆς πόλεως.

In Istanbul codex *Hagia Triada 72* (published in Schreiner 1975, no.87.1, p.612) we find the following chronographical information:

“In the year 6852, in the twelfth indiction, in the twentieth solar cycle, in the twelfth lunar cycle, during the reign of the God-loving emperors John Palaeologus and John Cantacuzenus, on 18 of the month of October [1343], the feast of the Holy Apostle and

Evangelist Luke, a Saturday, there was a terrible earthquake, such that the walls collapsed in many places, except for those in the city of Constantine. And that same evening, at the first hour of the night, there was another great earthquake, terrifying [he goes on to describe the tsunami: see below for the actual text].

ἔτους ςωνβ', ἰνδικτιῶνος ιβ', κύκλου ἡλίου κ', σελήνης κύκλου ιβ', ἐπὶ τῆς βασιλείας τῶν φιλοχρίστων βασιλέων Ἰωάννου τοῦ Παλαιολόγου καὶ Ἰωάννου τοῦ Καντακουζηνοῦ, ἐν μηνὶ ὀκτωβρίῳ ιη', τοῦ ἁγίου ἀποστόλου καὶ εὐαγγελιστοῦ Λουκᾶ, ἡμέρᾳ σαββάτῳ, ἐγένετο σεισμός φοβερός, ὥστε πολλὰ τεῖχη κατέπεσον ἐν διαφόροις τόποις, ἐξαιρέτως δὲ ταύτης τῆς πόλεως τοῦ Κωνσταντίνου. καὶ τῆ αὐτῆ ἑσπέρας, ὥρα α' τῆς νυκτός, πάλιν σεισμός μέγας ἐγένετο καὶ φοβερός, [...].

In 1343, 18 October was indeed a Saturday and the feast of St. Luke the Evangelist. The same information appears in abbreviated form at fol.47 in Athens manuscript Ethnike Bibliotheke 1429 (Schreiner 1975, no.113.1, p.681), where we find the following chronographical item:

"In the year 6852, in the twelfth indiction, in the month of October [1343], on the seventh day [Saturday], at the second hour, on 18 of the month, there was so great an earthquake that the walls of the City [of Constantinople] collapsed [the writer goes on to describe the tsunami: see below for the actual text].

κατὰ τὸ ςωνβ' ἔτος, ἰνδικτιῶνος ιβ', μηνὶ ὀκτωβρίῳ, ἡμέρᾳ ζ', ὥρα β', τῆ ιη' τοῦ αὐτοῦ, ἐγένετο σεισμός μέγας, ὥστε τὰ τεῖχη πεσεῖν τῆς Πόλεως [...].

A *Notula* by John Malakis in manuscript *Paris. graecus* 400, fol.160 (published in Darrouzès 1950, p.175) simply states:

"In the year 6852 [1343/44], there were some collapses in the City [of Constantinople]."

ἔτος ςωνβ' ἐγένετο πτώσις ἐν πόλει.

In Oxford manuscript Bodleian Barocci 197 (published in Turyn 1981, pp.108-12) we find various quite interesting *Notulae* written by Galaktion Madarakis (PLP 16102), who personally experienced the event. He writes not only about the earthquake of 18 October, but also about two other shocks which occurred on 14 October and 20 November 1343, but are not recorded by the other sources. Here are the *Notulae* in the order in which they appear (fols.374r., 380v., 426v.):

"While I was writing this book and had reached this point, there was an earthquake in Constantinople, in the year 6852 on 14 October [1343], in the twelfth indiction".

Γραφομένου μου τὸ παρὸν βιβλίον καὶ φθάσαντος ὧδε γέγονεν συσμός ἐν Κωνσταντινουπόλει κατὰ τὸ ςωνβ' ἔτει, μηνὶ ὀκτωβρίῳ ιδ' ἰνδικτιῶνος ιβ'.

"While I was writing this codex, and as I reached this point, there was a great earthquake in Constantinople, in the year 6852, in the twelfth indiction, on 18 October [1343]. The earthquake lasted for 12 days. Galaktion".

γραφομένου μου τὸ παρὸν βιβλίον καὶ φθάσαντος ὧδε, ἐγένετο σισμός μέγας ἐν Κωνσταντινουπόλει κατὰ τὸ ςωνβ' ἔτει, ἰνδικτιῶνος ιβ', μηνὶ ὀκτωβρίῳ ιη'. ἐπεκράτησε δὲ ὁ σισμός ἄχρι ἡμέρων ιβ'. ξθοθπωρην = Γαλακτίων.

"On the eve of the feast of the Presentation [of the Virgin Mary in the Temple, i.e. 20 November 1343], as I was writing and had reached this point, a great earthquake occurred".

τῆ παραμονῆ τῆς εἰσόδου γράφοντός μου καὶ φθάσαντος ἐνταῦθα, γέγονεν συσμός μέγας.

A *Notula* in Istanbul manuscript Chalki Panaghia 78, fol.37v. (published in Athenagoras 1935, p.178), provides this description:

"October 6851, on 18 of the month of October, a Saturday, at the third hour, the wrath

of God was felt at Byzantium, during the reign of the very pious Emperor John Palaeologus, for a great earthquake caused the walls and towers of the famous city to collapse, as did the churches as well [the writer goes on to describe the tsunami: see below for the actual text]. And everywhere there was repentance and great fear, alms were given, many prisoners were freed and interest and debts were cancelled”.

‘Οκτωβρίου ρωνα’ μηνι οκτωβριω ιη’ ημερα σαββατω ωρα τριτη εγενετο επι το βυζαντιον βασιλευοντος του ευσεβεστατου βασιλεως Ιωαννου του Παλαιολογου θεηλατος οργη σεισμος μεγας ωστε και τα τειχη και οι πύργοι της περιεύφημου πόλεως εύλαυθησαν ομοίως και οι ναοί [...] δὲ και ἐν τῇ δύσει και ἀνατολῇ τῇ δὲ ψ ημερα η̄γουν τῇ κ του μηνος ωρα θ εσχισθη εως ωρας ια’ και εγενετο ἐν ὄλω τῷ τόπω συντριβη και φόβος μεγας και ελεημοσύναι και ελευθερώσεως αιχμαλώτων πολλων και τοκισμων και χρεων αποκοποι.

Here again the wrong year is given (1342 instead of 1343).

The events of that year remained impressed in contemporary memory for a long time. There are in fact various contemporary or slightly later works where we find general references to seismic phenomena which are probably those of 1343-44. In a letter written in 1347 (ed. Hero, p.66.39-40), Gregory Acindynus, a Byzantine theologian who died in 1348, records signs that the world was coming to an end, including the fact that “the earth shakes and the sea exceeds its bounds”.

γην ἀστατουσαν, θάλατταν τους εαυτης υπερβαινουσαν ὄρους.

Acindynus, in his *Refutation* of Gregory Palamas (IV.39.25-26, ed. Nadal, p.377) similarly mentions as a sign of the approaching arrival of the Antichrist: “the violent earthquakes which have occurred in various places — more terrible than any others in living memory”

και σεισμοι κατα τοπους εξαισιοι, των πωποτε μνημονευομενων δεινοτατοι.

In an unpublished work entitled *Farewell Address to his Followers* (preserved in manuscript *graecus* 155 (=610), fol.32v, in the Biblioteca Nazionale Marciana, Venice), Gregory Acindynus mentions the collapse of the church of St.Sophia, which occurred in 1346 as a result of earthquakes in previous years, and he uses the episode as a material symbol of current upheavals in the Church in connection with Palamism:

“[...] the wonder of the universe, the temple of Divine Wisdom, not of the abominable base divinity but of the divinity which is above all things and creates all things. Just as this present upheaval will strike and damage the Church, it too makes use of a violent earthquake and upheaval, and by splitting open and causing the collapse of this universal temple, foreshadows future events”.

και τελευταίω τῷ πᾶν συνειληφῶτι τὸ θαῦμα τῆς οἰκουμένης, τῷ τῆς θείας ἐπωνύμω Σοφίας, οὐ τῆς ὑφειμένης και παλαμίου θεότητος, ἀλλὰ τῆς πάντων τῶν ὄντων ὑπερκειμένης, και πάντων ποιητικῆς ἥτις ἐπειδήπερ ἐμελλεν ὁ παρῶν τῆς ἀσεβείας σεισμός καταλαμβάνειν και ῥήξειν τὰς ἐκκλησίας, σεισμῶ τῆς γῆς ἐξαισίω και κλόνω, και τῇ ῥήξει τοῦ παγκοσμίου τουδε νεῶ και πτώσει τὸ μέλλον προεσημήνατο.

Alexius Macrembolites, a Byzantine writer and polemicist who died after 1349 or 1353, devoted one of his works to the collapse of the dome of St.Sophia in 1346 (*Opinions*, in Kourouses, 1969-70). He records that it happened:

“as a result of continual earthquakes”.

ὑπὸ πολλῶν κατα συνέχειαν γενομένων σεισμῶν.

In another work, the *Dialogue between the Rich and the Poor* (ed. Shevchenko 1960, p.203), Alexius Macrembolites makes general reference to earthquakes at Byzantium: “How long will it be until [God] restrains his wrath and ceases to shake the earth [...]?”

And the earth [...] trembles, as it is just that it should, ready to devour those who commit similar deeds”.

μέχρι τίνος οὐκ ὀργισθήσεται καὶ κλονήσῃ τὴν γῆν [...] κοινὴ πάντων μήτηρ, ταρασσεται εἰκότως, καταπιεῖν ὀργώσα τοὺς ταῦτα πράττοντας.

There is what seems to be another reference to these events in a document by the patriarch Callistus I, dating to the autumn of 1350. In it, he lists amongst the signs of divine wrath:

“[...] the terrible earthquakes and movements of the earth which shake it to its foundations, and the sea-waves which drag the angry sea beyond its limits”.

[...] οἱ τῆς γῆς ἀνατιναγμοὶ καὶ σεισμοί, ἐκ θεμελίων ταύτην σαλεύοντες, καὶ αἱ τῆς θαλάσσης φοβεραὶ ἐκδρομαὶ καὶ ἐπικλύσεις, βρυχωμένης ὥσπερ ἐν θυμῷ καὶ παρερχομένης τὰ ἑαυτῆς ὅρια.

Tsunami

Set out below are selected passages from the sources in which the effects of the tsunami are mentioned. Nicephorus Gregoras records:

“At the same time, the waters of the sea overflowed, flooding the land over a long stretch where it was flat and suitable for horse-riding, to a depth of ten stades [about 1.8 km]. At times the sea dragged away light vessels, dragging them inland from the ports and coastline where they were lying. And it flooded a great deal of land, overwhelming men, flocks and beasts of burden. The sea-wave returned to its usual and established shores after a considerable time, and mud and dead fish were to be seen everywhere”.

Ἐκκέχεται δ' ὁμοῦ καὶ τὸ τῆς θαλάττης ῥόθιον ὡς παρροτάτω τῆς χέρσου. καὶ μάλισθ' ὄπη πεδιάς καὶ ἱππήλατος ἦν ἡ γῆ, μέχρι καὶ ἐς δέκα σταδίους. συνέξηλασε δ' ἔνια καὶ ἔνιαχοῦ τῶν ἀκατίων, ὅσα πρὸς τοῖς λιμέσι καὶ τοῖς ἄλλοις παραλίαις, καὶ συνέτριψεν ἐν τῷ μεσογείῳ καὶ πλείστας δὲ κατέκλυσε χώρας, αὐτοῖς ἀνδράσι καὶ ποιμνίοις καὶ ζεύγεσι. παλινδρομοῦντός γε μὴν τοῦ ῥοθίου μεθ' ἱκανὸν πρὸς τὰς συνήθεις καὶ τεταγμένας εὐνάς, ἦν ἰδεῖν ἰλύος τὰ πάντα μεστὰ καὶ ἰχθύων νεκρῶν.

The chronicle in Bologna, Biblioteca Universitaria, manuscript 3632 (published in Schreiner 1975, no.9), provides a specific geographical detail about the tsunami at fol.352v.:

“In the year 6852 on [18] October [1343], there was a great earthquake, and the sea rose up as far as Stauros”.

ἔτει ρωνβ', ὀκτωβρίῳ <τη>, γέγονε σεισμός μέγας, ὅτε ὑψώθη καὶ ἡ θάλασσα ἕως Σταυροῦ.

Stauros (modern Beylerbey) is now situated within the metropolitan area of Istanbul to the north of Chrysoceramus (Janin 1964, p.489).

At fol.147v in Istanbul codex Hagia Triada 72 (published in Schreiner 1975, no.87.1), we find further chronographical information in the form of details which seem to suggest that the tsunami began at the same time as the earthquake of the evening of 18 October: “And that same evening [18 October 1343], at the first hour of the night, there was another great and terrifying earthquake, with the result that the sea, too, was disturbed and overflowed its limits. And the sea-wave caused ships to be thrown violently [lacuna] over a large area. And when the sea returned to its place, they were left high and dry”.

καὶ τῇ αὐτῇ ἑσπέρα, ὥρα α' τῆς νυκτός, πάλιν σεισμός μέγας ἐγένετο καὶ φοβερός, ὡς καὶ τὴν θάλασσαν ταραχθῆναι καὶ ἐκβῆναι ἀπὸ τῶν ὁρίων αὐτῆς. καὶ ἐκ τοῦ ταύτης βρασμοῦ τὰ εὐρεθέντα πλοῖα ἀπὸ τῆς πολλῆς ῥύμης *** ἀπορριφθέντα τόπω μακρῷ. καὶ ὑποστρέψασα εἰς τὸν τόπον αὐτῆς ἔμειναν τὰ πλοῖα ἐν τῇ ξηρᾷ.

At fol.47 in Athens manuscript Ethn. Bibl. 1429 (Schreiner 1975, no.113.1), the same information appears in abbreviated form:

"[...] and the sea boiled and overflowed its limits and covered nearby dwellings".

[...] καὶ ἡ θάλασσα ἀνέβρασε καὶ ἐξῆλθε ἀπὸ τῶν ὁρίων αὐτῆς καὶ ἐκάλυψε τὰ πλησίον αὐτῆς οἰκῆματα.

The *Notula* in Istanbul manuscript Chalki Panaghia 78, fol.37v. (published in Athenagoras 1935, p.178), contains this description:

"And also during the night [of 18 October 1343 the earthquake] struck again more powerfully, and the sea rose up towards the walls to the height of a man, or that of two or three men. In both a westerly and easterly direction on the following day, 20 of the month. [the sea] was agitated from the ninth to the eleventh hour".

ἔτι δὲ καὶ τὴν νύκτα γέγονεν σφοδρότερος καὶ ὑψώθη ἡ θάλασσα εἰς τὰ τεῖχη εἰς μέρη ἀνδρός καὶ εἰς μέρος ψ καὶ εἰς μέρος γ γέγονε δὲ καὶ ἐν τῇ δύσει καὶ ἀνατολῇ τῇ δὲ ψ ἡμέρα ἤγουν τῇ κ τοῦ μηνὸς ὥρα θ ἐσχίσθη ἕως ὥρας ια'

Grumel (1958, p.481) wrongly dates the earthquake to 11 October. Some catalogues (Papadopoulos and Chalkis 1984, p.311 tab.1; Papazachos *et al.* 1986, p.81, tab.1) wrongly date the tsunami to 1344. According to Papadopoulos and Chalkis (1984, p.311, tab.1) the tsunami also struck Chios, but they are probably confusing it with the tsunami of 20 March 1389, which did indeed strike Chios (see the relative entry).

▲
1343 10 14 at morning

localities	lat.	long.	I	localities	lat.	long.	I
Istanbul	41 02	28 57	VIII	Orta Köy	40 36	26 51	F

1343 10 18 16:15 UT Ts

localities	lat.	long.	I
Beylerbey	41 03	29 04	Ts

1343 11 20

localities	lat.	long.	I
Istanbul	41 02	28 57	F

< 182 > 1344 January 3 South-eastern Turkey and northern Syria

sources 1 Ibn al-Wardi, *Tatimmat*, II, p.338; Ibn Kathir, *al-Bidaya*, XIV, p.211; al-Maqrizi, *al-Suluk*, II, 3, p.652; al-Ayni, *Yqd*, XXIV, 1, p.70 (in Taher 1979, part in Arabic, p.196)

sources 2 BNFrance, ms. Ar 1536, Ibn al-Shihna, *Rawd*, fol.63v.; al-Suyuti, *Kashf*, p.55; Ibn Habib, *Tadhkirat*, II, p.58

literature Taher (1979); Poirier *et al.* (1980)

historiography Alishan (1881); Zeyt'unyan (1991)

catalogues d. von Hoff (1840); Perrey (1850); Sieberg (1932a); *Ambraseys *et al.* (1994)

catalogues p. Poirier and Taher (1980); al-Hakeem (1988)

On 3 January 1344, a destructive earthquake struck the area comprising present-day central and southern Turkey (eastern Anatolia) and northern Syria. The earthquake is recorded as involving two shocks in close sequence. The effects may have been due to a number of earthquakes which are not easily identifiable in the sources.

At the citadel (castle) of Manbij in Syria, almost all buildings collapsed and there were a great many victims. There was similar damage at other localities in its dis-

trict: the fortresses of Bayra (present-day Birecik), 'Ayntab (present-day Gaziantep) and Rawandan, all of which are in Turkey, and that of Muslimi-ya, in Syria, were largely reduced to ruins. Farther north, there was also massive destruction and widespread collapses at the fortress of Bahasna (present-day Besni in Turkey). Aleppo (Halab) also suffered very serious damage: 32 towers collapsed at its citadel and many houses, mosques and shrines were destroyed. The town walls were also badly damaged. In relation to the worst affected area, it is recorded that the places concerned were abandoned by their inhabitants for more than a month. The felt area stretched as far east as Mardin, and to the south, the earthquake was slightly felt by a few people at Damascus. The report by some sources that it was strongly felt in Syria and Egypt is in all probability to be explained as a conflation of two quite separate seismic events, which have in common only the year in which they occurred (see also entry < 178 >).

The earthquake is recorded briefly by the contemporary Syrian Arab historian Ibn al-Wardi (1290-1349):

"In that year, towards the middle of *Sha'ban*, there was a tremendous earthquake which caused a great deal of destruction in Aleppo and its province, especially at Manbij, where the fine fortress of Rawandan was damaged".

وفيهما في منتصف شعبان وقعت الزلزلة العظيمة وخربت بحلب وبلادها أماكن ولاسيما منبج فإنها أقلت وأزالت محاسنها وكذلك قلعة الراوندان.

The reliable contemporary Damascene historian Ibn Kathir (1300-1373) provides some extra items of information, reporting in particular that the earthquake was slightly felt at Damascus:

"On Saturday 15 [indeed 16] *Sha'ban*, there was an earthquake at Damascus, of which many were unaware, because it was so weak, thanks be to God. Then there came news that there had been massive [earthquake] damage in the province of Aleppo: some towers had collapsed at the citadel, as had many houses and mosques, shrines and town walls. Many citadels in the surrounding area were also destroyed. It was said that little or nothing remained of the fortress at the town of Manbij and that all those who lived there had died in the ruins. God have mercy on them".

في يوم السبت الخامس عشر منه (شعبان) جاءت زلزلة بدمشق لم يشعر بها كثير من الناس لخفتها والله الحمد والمنة ثم تواترت الأخبار بأنها شعشت في بلاد حلب شينا كثيرا من العمران حتى سقط بعض الأبراج بقلعة حلب وكثيرا من دورها ومساجدها ومشاهدها وجدرانها وأما في القلاع حولها فكثير جدا وذكروا أن مدينة منبج لم يبق منها إلا القليل وأن عامة الساكنين بها هلكوا تحت الردم ورحمهم الله.

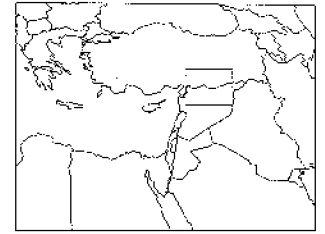
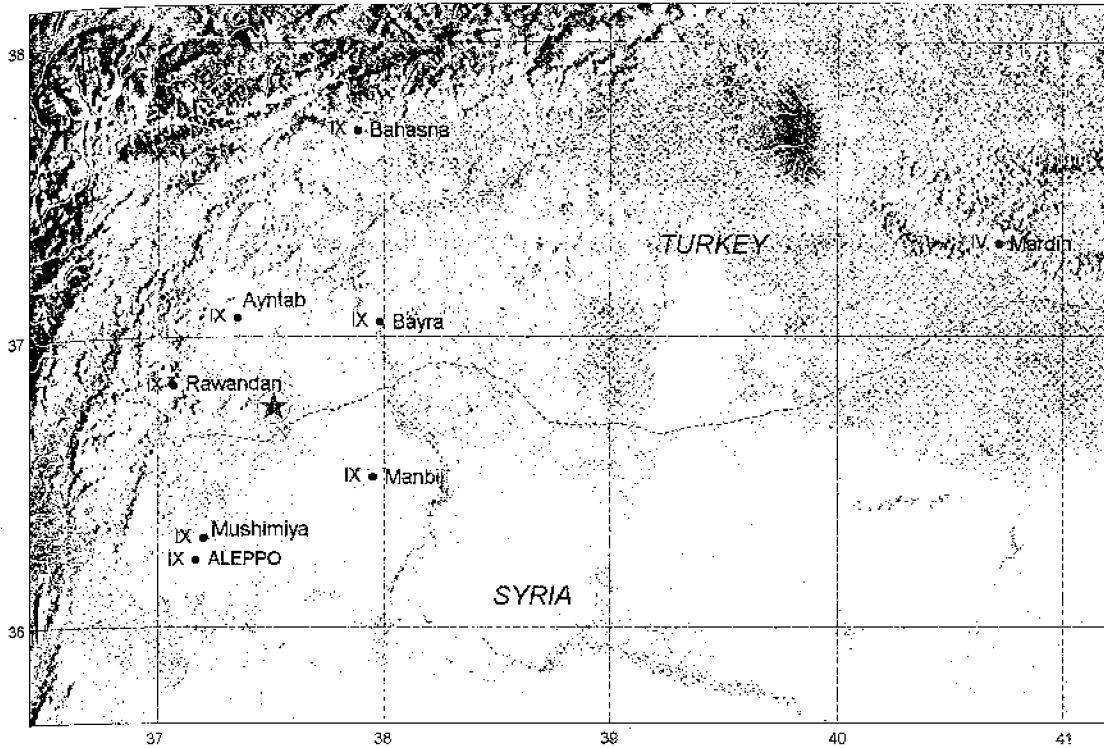
The contemporary Syrian Arab historian Ibn Habib (1310-1377) is one of the sources for this earthquake who extends the damage zone to Egypt as well:

"In the month of *Sha'ban* in this year [744 of the Hegira], there was a violent earthquake which brought trouble, caused panic, affected the whole country and worried the inhabitants, putting them in a state of agitation and destroying buildings, and that is how it affected Egypt and Syria".

وفي شعبان منها كانت الزلزلة العظيمة المزجة المحرجة العميمة التي عمت البلاد وغمت العباد وحركت الساكن وخربت الاماكن دخلت الى مصر والشام

Valuable as well as detailed information is to be found in al-'Ayni (1361-1451), a Turkish historian who wrote a chronicle in Arabic. Although he was not alive at the time of the event, he was able to base his record on the first-hand, eye-witness evidence of his father:

"In that year there was a tremendous and dreadful earthquake which caused much destruction in the Egyptian province and above all in Syria, especially in the mountain region. At the fourth hour of the day on Saturday 16 *Sha'ban* in the year 744, the



1344
January 3

0 90 km

fig. 78

earthquake struck Aleppo and the surrounding area, causing much of the citadel [of Aleppo] to collapse, and spreading ruin along the northern coast: at 'Ayntab, for example, and at the fortress of the Muslims [Muslimi-ya] [and that] of Al-Bayra. It was said that the shock reached as far as Mardin. The first shock was followed by a second, weaker one. The earthquake inflicted a severe wound on the people of Aleppo. They went out into the countryside and camped there for days. The earthquake was most violent at the town of Manbij, which was entirely destroyed, burying most of the inhabitants in the ruins. About 5,700 men and women survived, but to God we belong and to God we return. My father, who was very young at the time of the earthquake, has told me that the people of 'Ayntab stayed in tents for forty days, as did the inhabitants of Aleppo and the other Syrian towns [affected by the earthquake]".

وفيها كانت الزلزلة العظمى المزعجة التي حركت السواكن وأخرت كثيرا من الأماكن دخلت إلى الشام والديار المصرية وكانت في الشام أكثر ضررا ولا سيما في البلاد الجبلية ويقال في الساعة الرابعة من نهار السبت السادس عشر من شعبان المكرم من سنة أربع وأربعين وسبعمئة حصلت زلزلة عظيمة بحلب وبلادها وأخرت شيئا كثيرا بقلعة حلب وبالغور الشمالية مثل عينتاب وقلعة المسلمين والبيرة وقيل إنها وصلت إلى ماردين وحصلت بعد هذه الزلزلة زلزلة لطيفة وحصل عند أهل حلب وبلادها من ذلك جرح عظيمة فخرجوا إلى ظاهر البلاد ونصبوا خياما وأقاموا بظاهر البلد أياما وكانت قوة هذه الزلزلة في مدينة منبج وتهدمت جميعها وهلك معظم أهلها تحت الردم وما سلم من أهلها من الرجال والنساء مقدار خمسة آلاف وسبعمئة نفس إننا لله وإننا إليه راجعون. ولقد أخبرني والدي أنه كان في أيام الزلزلة ما دون البلوغ وأنهم أقاموا بظاهر مدينة عينتاب مقدار أربعين يوما تحت خباء وخيام وكذلك أهل حلب وأهل البلاد الشامية.

Al-Maqrizi (1364-1442) is a reliable source, and well-informed about the earthquake: "[In the month of *Rajab*], this message came from Aleppo: 'On Saturday 16 *Sha'ban*, thunder and lightning heralded a tremendous, fear-inspiring earthquake felt up to half a mile from Aleppo. Thirty-two towers in the citadel [of Aleppo] were destroyed,

as well as houses. The fortress at Bayra was more than half destroyed, as were the fortresses of 'Ayntab, Rawandan, that of Bahasna and that of the Muslims [Muslimi-ya]. The district of Manbij was also destroyed. The inhabitants of Aleppo fled into the countryside, setting up tented camps, and leaving the markets closed. Every hour a terrible roar was heard. People gathered in groups, bared their heads, and with their children, Koran in hand, they began praying to God to take this catastrophe away from men. Only God knows exactly how many victims were buried in the ruins. For the work of reconstruction, the assistance of the financial authorities was sought".

(في رجب) قدم البريد بمحضر ثابت على قضاة حلب يتضمن أنه لما كان يوم السبت سادس عشر شعبان إذا برعد وبرق أعقبته زلزلة عظيمة سمع حسها من نصف ميل عن حلب وهو حس مزعج يرض القلوب فهدم من قلعة البيرة أكثر من نصفها وكذلك من قلعة عينتاب وقلعة راوند يسمع دوى جديد ثم إنهم تجمعوا وبهسنا وبلاد منبج وقلعة المسلمين. فخرج أهل حلب إلى ظاهرها وضربوا الخيام وغلقت أسواقها وفي كل ساعة عن آخرهم وكشفوا رؤوسهم ومعهم أطفالهم والمصاحف مرفوعة وهم يضجون بالدعاء والابتهاال إلى الله برفع هذه المقت فأقاموا على ذلك أياما إلى خامس عشرية حتى رفع الله ذلك عنهم بعدما هلكت بتلك البلاد تحت الردم خلائق لا يحصيها إلا خالقها فكتب بتجديد عبارة ما هدم مسن القلاع من الأموال الديوانية.

Like Ibn Habib and the historians of later centuries, Ibn al-Shihna, a historian who was active in the late 14th and early 15th century, records an earthquake affecting Syria and Egypt:

"In the year 744 [of the Hegira], there was a violent earthquake in Egypt and Syria and people left for the desert. And the earthquakes continued. It is said [this is a reference to *Sura* 99 of the Koran, entitled "The Earthquake"]: the earth has brought to bear its earthquake upon us and each one who was there asked what ailed her. I said: issue forth into the desert, your earth has shown her strength".

وفي سنة أربع وأربعين وسبعمائة كانت الزلزلة العظيمة بمصر والشام وخرج الناس إلى الصحارى وتواترت بعدها زلازل وقال زلزلة الأرض بنا زلزالها وقال كل من عليها ما لها فقلت ادبروا إلى الصحرى فيها قد اخرجت أرضكم أثقالها.

Finally, al-Suyuti, a reliable source who lived from 1445 to 1505, states:

"There was a violent earthquake in Egypt and Syria. People fled out of the towns into the countryside. The first shock was followed by other shocks".

كانت الزلزلة عظيمة في مصر والشام وخرج الناس إلى الصحارى وتواترت بعدها زلازل مرة.

In our opinion the effects in Egypt were the result of a separate earthquake (see the event listed at the date 1343 May 26 - 1344 May 14).

▲ 1344 01 03 8:00 UT ★ = 36 45 37 31 I₀ = IX Me = 6.0 Sites: 9

localities	lat.	long.	I	localities	lat.	long.	I
Aleppo SYR	36 14	37 10	IX	Muslimi-ya SYR	36 18	37 12	IX
Besni TR	37 42	37 58	IX	Rawandan TR	36 50	37 04	IX
Birecik TR	37 03	37 59	IX	Mardin TR	37 19	40 43	IV
Gaziantep TR	37 04	37 21	IX	Damascus SYR	33 30	36 19	IV
Manbij SYR	36 31	37 57	IX				

< 183 > 1344 November 6 Sea of Marmara [Turkey]

sources Greg., *Hist.*, 14.2, II, pp.695-6; Cantac., *Hist.*, 3.76, II, p.477; *Chron. min. Byz.* 87.2, in Schreiner (1975, p.613)

historiography Schreiner (1977)

literature Guidoboni and Comastri (2002)

catalogues d. Grumel (1958); Ambraseys and Finkel (1991); Evangelatou-Notara (1993); *Papazachos and Papazachou (1997)

After the earthquake sequence lasting from the autumn of 1343 to the summer of 1344 (see the relative entry), there were further frequent shocks in the autumn of 1344, affecting Constantinople and the Thracian coast at the western end of the Sea of Marmara. The strongest shock occurred on 6 November 1344: on the Thracian coast, the fortresses of Ganos (present-day Gaziköy) were completely destroyed, as was that of Marmara, known as *Teichos*. At the citadel of Chora (Höşköy), the walls and more than half the houses collapsed; and more than three hundred people were buried in the ruins. In Constantinople the east side of the apse in the church of St. Sophia, which had already been damaged in the shocks of the previous year, slowly continued splitting open, with the result that a large number of bricks and mosaic tesserae fell to the ground. The bronze statue of St. Michael on a column in front of the basilica of the Holy Apostles was again damaged, having already suffered in the earthquake of 1296. As a result of damage from the earthquakes of 1343 and 1344, and for lack of prompt restoration work, the east apse and a third of the dome of the church of St. Sophia collapsed on 19 May 1346. But there were no earthquakes on that day. For this "delayed" collapse, see Guidoboni and Comastri (2002). Information about this earthquake is to be found in the writings of two contemporary Byzantine authors: the historian Nicephorus Gregoras and the Emperor John VI Cantacuzenus (1347-1354), as well as in a Byzantine *Notula*. After referring to the shocks which struck Constantinople from the autumn of 1343 to the summer of 1344, Nicephorus Gregoras continues as follows: "But on the very day of the arrival of the following autumn [1344], similar shocks began to disturb and shake the earth again. The shocks were so frequent that their violence overcame the resistance of the bronze statue in angel's garb placed on a brick column, so that its head leaned over on to both shoulders, whereas in the case of the previous statue erected by the Emperor Palaeologus, the model of the city which he held in his hands fell to the ground. These prodigies caused some to suggest and prophesy that

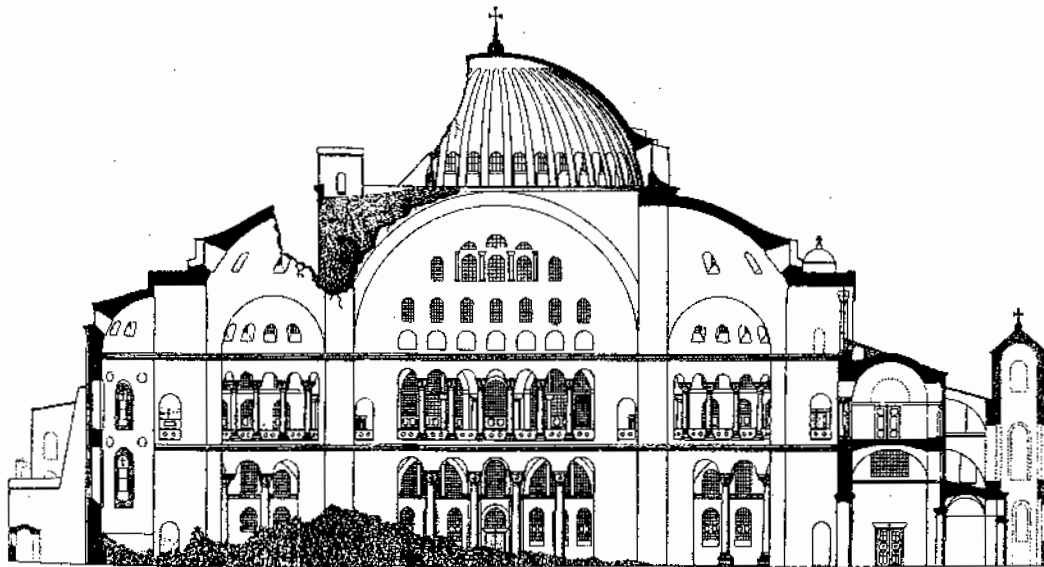


fig. 79 Constantinople (Istanbul): on 19 May 1346, about two years after the earthquake of 6 November 1344, the west side of the dome of the church of St. Sophia collapsed (from Antoniadis 1907). The date of this collapse subsequently became attached in the literature to an (obviously false) earthquake.



1344
November 6

0 60 km

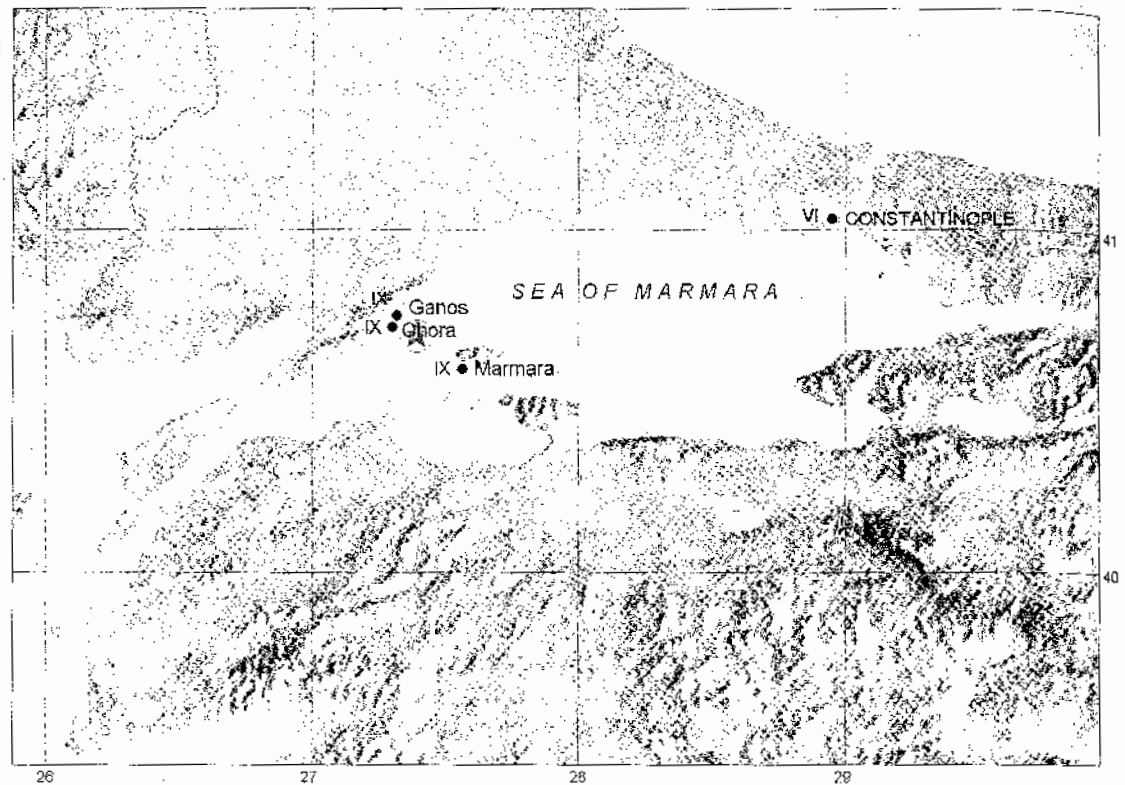


fig. 80

the long dominion of the Palaeologi would be overthrown. Furthermore, the east side of the apse of St. Sophia, which had previously been stressed and strained, gradually and increasingly split open, causing many bricks and mosaic tesserae to fall, until it finally suffered complete collapse. We will deal with this in some detail for the benefit of those who may read this passage”.

Κατὰ μέντοι περίοδον χρονικὴν τοῦ κατόπιν βαδίζοντος φθινοπώρου ἐκ τῆς αὐτῆς ὡσαύτως ἡμέρας ὅμοιοι πάλιν ἀρξάμενοι τὴν γῆν συνετάραττον τε καὶ ἐθορύβουν σεισμοί· ὡς ἐκ τῆς τῶν τοιούτων σεισμῶν συνεχείας τὸν τ' ἐπὶ τοῦ πλινθωτοῦ κίονος ἐν ἀγγελικῷ τῷ σχήματι χαλκοῦν ἀνδριάντα καὶ ἅμα τὸν τοῦ προβεβασιλευκότος Παλαιολόγου τῆ βίᾳ καταγωνισθέντας τῷ μὲν ἐπὶ θατέρου τῶν ὤμων κεκλίσθαι τὴν κεφαλὴν, τῷ δὲ πρὸ ποδῶν ἐρρίφθαι τὸν ἐν χεροῖν τῆς πόλεως σχηματισμόν· ὡς εἰκασμοῖς τισιν ἐντεῦθεν ἐννοίας τινὰς ἀναλεξαμένοις ἐνίοις ἀποπεφάνθαι, μὴ εἰς μακρὰν τῆς τῶν Παλαιολόγων αὐτοκρατορίας ἐσεσθαι τὴν καταστροφὴν. Κατὰ τούτοις τὸ προπεπονθὸς τῆς ἐφ᾽ ἁψίδος τοῦ τῆς τοῦ θεοῦ Σοφίας νεῶ καταπονούμενον ἡσυχῇ παρερρήγηυτο μᾶλλον αἰεὶ, καὶ πολλὰς ἐκεῖθεν ψηφίδων καὶ πλίνθων κατέρριπτε, μέχρι τῆς παντελοῦς πτώσεως· περὶ ἧς ἡμῖν κατὰ χώραν ἰοῦσιν ἀποχρώντος λελέξεται.

The date of the earthquake in the autumn of 1344 has been firmly established from a *Notula* in Istanbul codex Hagia Triada 72 (published in Schreiner 1975, no.87.2):

“In 6853 on 6 November [1344], at the fourth hour of the day, there was a tremendous earthquake, which caused the collapse of the fortresses of Ganos and Chora, as well as the fortress of Marmara known as *Teichos* [the wall], and their foundations were uprooted. And from then onwards there were troubles for the Emperor Cantacuzenus.

τῷ δὲ ἡμερῶν, τῆς α' τοῦ νοεμβρίου, ἡμέρα σαββάτω, ὥρα δ' τῆς ἡμέρας, γέγονε σεισμός φοβερῶτατος, ὥστε χαλάσαι τὸ Γάνου κάστρον, ἢ Χώρα καὶ τὸ κάστρον τοῦ

Μαρμαρά, τὸ ἐπονομαζόμενον Τεῖχος, καὶ τὰ θεμέλια ἐκρίζωθῆναι. καὶ ἀπὸ τότε ταραχαὶ ἦσαν εἰς τὸν βασιλέα Καντακουζηνόν.

Cantacuzenus was fighting the Turks at the time, and he tells how he happened to be at a citadel called Chora, near Myriophytus (Mürefte) in Thrace, and suggested to its inhabitants that they should surrender. At this, the inhabitants insulted him, but an earthquake took them by surprise:

"While they were still busy offering insults, there was suddenly a considerable earthquake. The walls of the town and more than half the houses collapsed, and more than three hundred people were buried under the houses and walls. Those who escaped the danger rushed out to the emperor, fearing that they and their children would be enslaved. At the same hour, as a result of that earthquake, the house where the emperor had held court also completely collapsed. Since he escaped this manifest danger, it was clear what God had preordained for him".

ἐτι δὲ περὶ τὰς ὕβρεις ἐκείνων ὄντων, σεισμὸς ἐγένετο ἐξαίσιος οἶος, καὶ τὰ τε τείχη κατέπιπτε τῆς πόλεως, καὶ τῶν οἰκιῶν ὑπὲρ τὰς δύο μοίρας, καὶ κατεχώσθησαν ὑπὸ τῶν τειχῶν καὶ τῶν οἰκιῶν ὑπὲρ τριακοσίου. ὅσοι δὲ διέφυγον τὸν κίνδυνον, βασιλεῖ προσέδραμον ἐξεληθόντες, καὶ ἐδέοντο μὴ σφᾶς καὶ τέκνα περιδεῖν ὑπὸ τῶν βαρβάρων ἀνδραποδισθέντας ἄν. τῆς αὐτῆς δὲ ὥρας ὑπὸ τοῦ σεισμοῦ ἐκείνου καὶ ἡ οἰκία, εἰς ἣν ἠλίκατο ὁ βασιλεὺς τὴν νύκτα, κατέπεσεν ἐκ θεμελίων, καὶ ἡ περὶ βασιλέα τοῦ θεοῦ πρόνοια ἐγένετο καταφανής, οὕτως ἐκ προδήλου κινδύνου ῥυσαμένου.

Grumel (1958, p.481) wrongly dates the earthquake to 1341.

▲ 1344 11 06 8:00 UT ☉ = 40 41 27 24 I ₀ = IX Me = 6.0 Sites: 4							
localities	lat.	long.	I	localities	lat.	long.	I
Gaziköy	40 45	27 19	IX	Marmara	40 35	27 33	IX
Höşköy	40 43	27 18	IX	Istanbul	41 02	28 57	VI

<184> 1344 December 25 – 1345 December 24 [794 A. e.] **Erznka**
[eastern Turkey]

sources *Chron. min. Arm.*, II.11, p.264; *Chron. earth. Erznka*, in Yerevan ms. 10.200, fol.382v;
Am. Erznka, *Chron.*, in Yerevan ms. 10.200, fol.386r., in Xanlaryan (1990, p.542 no.513)
catalogue d. *Ambraseys and Melville (1982)

In the year 794 of the Armenian era (25 December 1344 – 24 December 1345), a strong earthquake was felt at Erzincan (in present-day Turkey). Since no damage is recorded and the earthquake is described as a swaying movement, the city of Erzincan was probably a long way from the epicentre. The source for this event is the 17th century chronicle of Gregory of Kamakh (*Chron. min. Arm.* II.11), which records: "In 794 [25 December 1344 – 24 December 1345], there was an earthquake at Erznka, with a great swaying, like the rolling of a ship at sea; but with God's protection it did not collapse".

Թուին ՉՂԴ շարժ եղև յերզնկան շատ երերաց, գերթ նաև ի վեր ծովուն, Աստուած պահեց, որ ոչ փլու.

The *Chronicle of the earthquakes of Erznka* (in Yerevan manuscript 10.200, fol.382v., published in Xanlaryan 1990, p.542, no.513) and the *Chronology* of Amiras, preserved in the same manuscript (fol.386r.), provide a similar report.

▲ 1344 12 25 – 1345 12 24 [794 A. e.]				
localities	lat.	long.	I	
Erzincan	39 44	39 30	V-VI	

< 185 > 1345 September 12 Florence [Tuscany, Italy]

< 186 > 1345 December 22 Florence

- sources 1 G.Villani, *Nuova Cron.*, vol.3, p.415; March. Coppo Stef., *Cron.*, p.224
sources 2 BRiccMor, Florence, Mss. Moreniani, 269, *Prior città di Firenze*, fols.86v.-87r.
historiography Farulli (1713)
literature Castelli *et al.* (1989); Castelli and Moriani (1990); Castelli (1991)
catalogues d. Bonito (1691); von Hoff (1840); Perrey (1848); Mallet (1853); Mercalli (1883); Baratta (1898, 1901); *Conversini *et al.* (1990); *Boschi *et al.* (1995, 1997, 2000)
catalogues d. Giorgetti and Iaccarino (1971); Carrozzo *et al.* (1973); Postpischl (1985); CPTI (1999)

On 12 September and 22 December 1345, two earthquake struck Florence, causing much panic but little damage.

A description of seismic effects in Florence is provided by two contemporary chroniclers, Giovanni Villani and Marchionne di Coppo Stefani, both of whom were eyewitnesses, as well as being actively involved in the political life of their city. Villani indicates the days on which the shocks were felt, but does not identify specific effects: "In this year [1345], on 12 September and then on 22 December, at night, there were powerful shocks, but they did not last long".

In questo anno, a dì XII di settembre, e poi a dì XXII di dicembre, di notte, furono grandi tremuoti, ma durarono poco.

Marchionne di Coppo Stefani gives only the months when the shocks occurred but, unlike Villani, he mentions slight damage:

"Concerning shocks and other troubles which happened in Florence. In the said year [1345], it was hot and dry, and then in September and December there were great earthquakes in Florence, and while damage was slight, there was very great fear".

Di tremoti ed altri affanni che furono in Firenze.

Nel detto anno fu grande caldo e secco, e poi appresso il settembre ed il dicembre furono grandi termuoti in Firenze, comechè danno fosse piccolo, ma la paura fu grandissima.

The 18th century scholar Farulli (1713), quoted by Baratta (1901), reports the destruction of numerous dwellings at Sansepolcro, and some victims. As in other cases, when the information offered by this author is compared with contemporary documentary sources, it is found to be highly unreliable: in fact the *Libri dei morti* and the *Testamenti in favore della Fraternita di S.Bartolomeo* (preserved in the Archivio Storico Comunale at Sansepolcro, and quoted in Castelli 1990) have nothing to say either about the earthquake or about victims for the year 1345. Similarly, Bercordati (16th c.) and Graziani (1745, edition of a 16th century manuscript) — two local chroniclers who were not contemporary with the event but nearer to it in time than Farulli — do not mention the earthquake. Bercordati did record, however, that Sansepolcro experienced famine in 1345 — an occurrence of great social and economic importance. It therefore seems reasonable to reject the suggestion that the earthquake affected Sansepolcro. Given the above considerations, and the fact that our only reliable information relates to Florence, it is not possible to identify the epicentre of this earthquake with any certainty.



1345 09 12

localities	lat.	long.	I
Florence	43 47	11 15	VI

1345 12 22

localities	lat.	long.	I
Florence	43 47	11 15	VI

< 187 > 1346 February 8 Modena [northern Italy]

< 188 > 1346 February 22 Po Plain

sources 1 Giov. Bazz., *Chron.*, p.130; Levalossi-Gazata, *Chron.*, col.62; Da Marano, *Cron.*, p.xxv

sources 2 BCariosteaFe, cl.I, 645, Rodi, *Ann. Ferrara*; Anonymous, *La città di Monza...*, p.69; Corio (1503); Buoni (1571)

historiography Schiavina (ed. 1863); Dondi (1896)

catalogues d. Ferrey (1848); Mallet (1853); Reginus (1880); Mercalli (1883, 1897); Baratta (1901); *Boschi *et al.* (1995, 1997, 2000)

catalogues p. Giorgetti and Iaccarino (1971); Carrozzo *et al.* (1973); Postpischl (1985); CPTI (1999)

The earthquakes of February 1346 make a rather interesting case study. Independent sources tell of an earthquake affecting an extensive area of the Po Plain, but do not provide any evidence to establish its epicentre. Damage is recorded only at Ferrara, but other unspecified localities seem to have been struck. It may perhaps have been a sequence of shocks, but dates have been established only for two.

A review of primary sources has made it possible to identify two separate shocks; and a more careful analysis of first-hand accounts has resulted in the removal of some localities which had previously been given a classification.

There is evidence of an earthquake at Modena during the night of 8 February 1346, but no effects are specified. During the evening of 22 February in the same year, a strong shock struck Ferrara and the surrounding countryside, causing many houses, palaces and towers to collapse. Many farmhouses and barns collapsed in the countryside; at Monza, we are told, the shock was "very strong"; at Reggio Emilia the earthquake was probably felt. It seems likely that the shock affected a large area of the Po Plain. The aftershocks lasted for three hours at Ferrara.

The earthquake of 8 February is recorded in the *Chronicon Mutinense*, a contemporary and local work compiled by Giovanni da Bazzano, a Modenese notary:

"1346, on Wednesday 8 February at about the time of one's first sleep, there was an earthquake in the city of Modena".

M.CCCXXXVJ die mercurii viij februaryi iuxta horam primi somni in civitate Mutianae fuit terraemotus.

The most detailed evidence about the effects of the earthquake of 22 February is to be found in the work of a Ferrarese chronicler, Giacomo da Marano (publ. 1930), who lived from 1344 to 1412. He records:

"1346. At dinner time on 22 February, a great earthquake began to be felt in Ferrara, and they say that it was felt throughout the world. It was very terrifying, and nobody had ever felt a stronger one, so many houses, palaces and towers collapsed in Ferrara, and in the countryside, farmhouses, barns, *pieze* [?] and other buildings collapsed. We learned of this from reports from various parts of the world about the month and day when it happened. The earthquake lasted nearly three hours before the ground stopped shaking, and this struck tremendous fear into the heart of everyone".

1346. *Nell'ora del desinare li 22 febraro, cominciò a sentirsi un gran terremoto in Ferrara, del quale fu detto, che fosse sentito per tutto il mondo. Fu molto terribile, ne era niun uomo che avesse mai sentito il più grande, di modo che cascarono molte case,*

palazzi e torri in Ferrara e nelle ville casamenti, fenili, pieze et altri ediftii. Ciò s'intese secondo li avvisi che furono mandati da diverse parti del mondo, del mese et giorno che tirò, qual terremoto durò poco manco di tre hore prima che la terra si fermasse, il che pose grandissimo spavento nel cuore di ciascheduna creatura.

The description of the event provided by Filippo Rodi, a 16th century chronicler (Biblioteca Comunale Ariostea, Ferrara, *Manuscripts*, cl.I, 645), not only repeats much of the evidence from the earlier chronicle, but also adds the detail that many people died in the ruins. This may perhaps be due to the fact that Rodi was *sindaco generale* for the entire Este dominions, and therefore had access to the rich documentary material in the Este state archives, part of which is no longer available.

The shock of 22 February is also recorded in the *Chronicon Regiense*, compiled by another contemporary writer, the notary Sagacino Levalossi: the description is rather confused, but the reference to evening is a detail which suggests that the earthquake was also felt at Reggio Emilia. Levalossi records:

"On 22 February in 1346, there was a great earthquake throughout the world, and it happened late in the day, causing the destruction of many towers and houses".

MCCCXLVI die XXII februarii factus est terraemotus maximus per universum orbem, et fuit in sero, ex quo multae turres, et domus dirutae sunt.

Keeping in mind the way writers expressed themselves in those days, we can use this piece of information — which was taken up in later centuries by chroniclers and historians — to establish one important characteristic of the 1346 earthquake: namely, that it affected a very large area. In *La città di Monza* (ed. Mezzotti, 1838-40, p.69), an anonymous local chronicle of Monza covering twelve centuries, we read:

"Monza 1346. A very violent earthquake occurred on 22 February".

Monza 1346. Terremoto assai gagliardo avvenuto ai 22 di febbraio.

The exact chronology of this seismic sequence is something of a puzzle: were there various shocks or only one? Giovanni da Bazzano provides the most chronological detail by specifying Wednesday, 8 February; and 8 February was indeed a Wednesday. Those other sources which give the date as 22 February do not tell us the day of the week. 22 February was in fact also a Wednesday, but that may be a coincidence. There are also partial discrepancies about the time of day when the shocks occurred. Giovanni da Bazzano says "about the time of one's first sleep", while Sagacino Levalossi uses the vague expression "late in the day"; and when Giacomo da Marano says "at dinner time", he may be referring to the evening meal. All these indications suggest the late evening or night time, but though they agree to some extent, they do not completely coincide. In view of the fact that Giovanni da Bazzano and the other sources have in common only the day of the week, but not the date or the exact hour, we think that there were two earthquake tremors: one on 8 and the other on 22 February 1346, and that they may have been part of a single, more complex seismic sequence.

As for the Lombard area in general, the information provided by Corio's *Historia di Milano* (1503) is too vague to allow us to establish whether the city of Milan suffered earthquake damage or not.

There are a great many references to the earthquake in northern Italian chronicles. In many cases, however, while works we have examined agree in recognising the earthquake as a major event, they do not tell us what places were affected. Conventional expressions are often found:

"almost throughout the universe, the earth was shaken by a huge earthquake...", "terrible earthquakes in Italy and elsewhere", "there was a very great earthquake throughout the world..." etc. Expressions of this kind are repeated by various chroniclers and historians from the 14th century onwards, and also occur in late local historiography.

But the generic nature of this kind of evidence makes it difficult to infer that the earthquake affected all the places where the chronicles were compiled.

▲ 1346 02 08

localities	lat.	long.	I
Modena	44 39	10 56	V

1346 02 22 11:00 UT Sites: 3

localities	lat.	long.	I	localities	lat.	long.	I
Ferrara	44 50	11 37	VII-VIII	Reggio nell'Emilia	44 41	10 37	F
Monza	45 35	09 16	V				

< 189 > 1347 December 8 Cairo [Egypt]

source 1 al-Maqrizi, *Suluk*, II/3, p.741
 source 2 al-Suyuti, *Kashf*, p.55
 literature Taher (1979)
 catalogue d. *Ambraseys *et al.* (1994)
 catalogue p. Poirier and Taher (1980)

On 8 December 1347, two earthquake shocks were felt in Cairo, but there is no report of damage. The principal source for the earthquake is al-Maqrizi, a contemporary writer from Cairo, who records: "On Saturday 4 *Ramadan* [748 H. = 8 December 1347], Cairo was twice shaken by an earthquake in a single hour".

و في يوم السبت رابع رمضان زلزلت القاهرة مرتين في ساعة واحدة.

al-Suyuti repeats the same information: "On 4 *Ramadan*, the earth shook twice in an hour at Cairo. Al-Maqrizi mentions this in his chronicle".

في رابع رمضان زلزلت القاهرة مرتين في ساعة واحدة. ذكره المقرئ في تاريخه.

Poirier and Taher (1980, p.2193) give this earthquake an intensity value of grade VI (MM); Ambraseys *et al.* (1994, p.102) give it an epicentral intensity of class F, which is equivalent in their classification to a range from felt to strong (up to grade VI MSK).

▲ 1347 12 08

localities	lat.	long.	I
Cairo	30 03	31 15	V

< 190 > 1348 January 25 Carinthia [southern Austria] and north-eastern Italy
 ▷ landslides, obstruction of watercourses, fissures,
 clouding of water in wells, tsunami? ◁

sources 1 Documents

[manuscripts] ASVe, *Senato*, Misti, reg. 24, fol.71r, 23 aprile 1348; fol.74r, 8 maggio 1348; Resolution by the Chapter at Aquileia, 23 May 1351, in *Cod. dipl. istr.* (ed. Kaendler 1996, pp.1245-6); Innocent VI (pope), Letter to the patriarch of Grado, 14 March 1354, in Joppi (1895, pp.249-51); Lodovico (patriarch of Aquileia), Letter to the king of Hungary, 1362, in Joppi (1895, pp.253-54); four documents in *Monum. Hist. Duc. Carin.* (ed. Wiessner 1968): no.340, 10 January 1351; no.640, 23 August 1364; no.867, 31 March 1380; no.981, 29 November 1391

- Italy BNMarciianaVe, *Mss. It.*, VII, 1275, Zancaruol, *Cron.*; BMCCorrer, Venice, *Mss. Cicogna*, 1063, *Cron.*; ASMi, *Diplomatico*, Statuti, cart.II, Statuti di Mozzanica, fol.16v., Verse composition; ASMo, Biblioteca, *Mss.*, 162, *Leggendario*, fol.42v.; Villani G., *Nuova Cron.*, vol.3, pp.562-6; Villani M., *Cron.*, vol.I, p.88; Giov. Pord., *Suppl.*, pp.56-7; De Grazia, *Chron.*, p.69; Zuvaro, *Note*, pp.109-11; *Liber Regim. Paduae*, pp.88, 164; Cortusi, *Hist.*, cols.926-7; Conf. Costoza, *Framm.*, p.11; Petrarca, Letter to Guido Sette, 1368 (ed. Bigi 1963, pp.960-3); Letter to Luigi Santo, 11 giugno 1350 (ed. Rossi, p.338); *Notae Veron.*, p.475; *Bozner Chron.*, in Schorn (1902, pp.117-8); Giov. Parma, *Cron.*, in Pezzana (1837, vol.I, Appendix, p.50); Aliprandi, *Alipran.*, p.132; Mussi Giov., *Chron.*, p.499; Nic. Ferr., *Polyst.*, col.806; Villola, *Chron.*, II, pp.583-4; *Ann. vet. Mutin.*, col.82; Levalossi-Gazata, *Chron.*, col.66
- Europe ÖNB, Vienna, *Codex Vindobonensis*, 2499, fol.69v., *Hexametri*; *Ann. Frisac.*, p.67; *Ann. S.Steph. Frising.*, p.59; *Ann. Mell. cont. Mell.*, p.513; *Ann. Mell. cont. Novimont.*, pp.674-6; *Ann. Zwetl.*, p.684; *Ann. Zwetl. cont. Zwetl. IV*, p.686; Math. Neuenb., *Gesta*, pp.532-4; Math. Neuenb., *Cron.*, p.262; Andr. Regensb., *Deuts. Aufzeich.*, pp.LXV-LXVI; Konr. Megenb., *Buch der Natur*, p.109; *Nota*, in Stolz (1957, p.35); Friet. Clos., *Chron.*, p.136; *Ann. Ensdorf.*, p.7; *Ann. Matseen.*, p.829; *Ann. Mechou.*, pp.669-70; *Ann. Mell. cont. Lambac.*, p.561; *Ann. Windberg.*, p.566; *Ann. Wratisl. maior.*, p.532; *Ann. Austr. cont. Claustron. V*, p.736; *Anon. Leob. Chron. Lib. Sext.*, p.968; *Chron. S.Petri Erford. mod. Addit.*, p.385-6; *Chron. S.Petri Erford. mod. Cont. II*, p.394; *Chron. S.Petri Erford. mod. Cont. III*, p.379; *Chron. de Duc. Bav.*, p.171; *Chron. Claustro-Neob.*, p.490; *Chron. aus Kaiser*, p.349; *Kalend. Zwetl.*, p.692; *Sächs. Weltchr.*, p.340; *Versus Babenb.*, p.639; Goswin, *Chron.*, p.135; Joh. Wintert., *Chron.*, p.275; Heinr. Taube, *Chron.*, p.89
- inscriptions 1. marble lunette in the entrance atrium of the former Scuola Grande della Carità, now the Venice Accademia delle Belle Arti; 2. church of St. James in Villach; 3. bell-tower of S.Mauro at Costozza; 4. inscription on the tomb of the patriarch Marquardo in the basilica at Aquileia
- sources 2 BNMarciianaVe, *Mss. It.*, VII, 102, Dandolo, *Cron.*, fol.72; *Mss. It.*, VII, 2048, Morosini, *Cron.*, I, fol.81; *Mss. It.*, VII, 519, Trevisan, *Cron.*, fol.102v.; *Mss. It.*, VII, 541, *Cron. Ven.*, fols.54v-55r.; *Mss. It.*, VII, 555, *Cron. Ven.*, fol.56; *Mss. It.*, VII, 1975-76, Caroldo, *Cron.*; *Mss. It.*, VII, 37, *Cron.*, fol.51v.; *Mss. It.*, VII, 39, *Cron. Ven.*, fol.45v.; *Mss. It.*, VII, 537, Barbaro, *Cron.*, fol.512; *Mss. It.*, VII, 2051, Vitturi, *Cron.*, fol.45; *Mss. It.*, VII, 2557-58, Dolfino, *Cron.*, fol.45; *Mss. It.*, VII, 56, Erizzo, *Cron.*; *Mss. It.*, Z.20.4746, *Cron.*, fol.78; BMCCorrer, Venice, *Mss. Cicogna*, 1232.7, *Croniche*, I, fols.228v-229r.; *Mss. Cicogna*, 1898, *Cron.*; *Mss. Cicogna*, 590, *Hist. Ant.*; *Mss. Cicogna*, 2710, *Cron.*, fol.141v.; *Mss. Cicogna*, 1899, *Cron.*; BFGCini, Venice, reel 73, *Cron. anon.*; BAVat, *Barb. Lat.*, 4798, *Ann.*, in Lollio, *Cron.*, fol.27v.; *Mss. Chig.*, I.I.6, *Cron.*, fol.6r.; BCBertolianaVi, *Mss.*, 3274, fasc.1, *Cron.*; BCPd, C.M. 548, *Cron.*; BCARIosteafa, *Mss.*, cl.I, 105, Olivi, *Ann.*, I, fol.125; *Mss.*, cl.I, 645, Rodi, *Ann.*, I, fol.270v.; BCUD, *Mss.*, *Fon. Joppi*, 317, *Notule*; *Fon. Joppi*, 419, *Cron. Patr.*, fol.11; *Fon. Joppi*, 419, *Cron. Ant.*; *Fon. Joppi*, 491, *Mem.*, fol.4; *Mss.*, *Fon. Princ.*, 780, *Cron.*, fols.5, 8; Palmieri, *Liber*, p.115; *Addit. Pass.*, p.57; *Chron. Esten.*, p.68; *Cron. ad mem. praet. temp.*, p.14; *Cron. Bologn.*, p.589; *Cron. Varign.*, p.584; Agazzari, *Chron.*, p.44; *Cron. Ramp.*, II, pp.581-2; Monaci, *Chron.*, p.311; Belloni, *Liber*, col.56; Ghirardacci, *Hist.*, p.190; Melli, *Hist.*, p.530; Platina, *Hist.*, col.734; Pierozzi, *Chron.*, p.355a; Sanudo, *Le Vite*, cols.614-15; Pagliarino, *Cron.*, p.114; *Chron. Elwacen.*, p.40; *Oberr. Chron.*, pp.64-5; Detmar, *Detm. Chronik*, pp.508-10; Ebendorfer, *Chron. Austr.*, p.259; Ebendorfer, *Chron. Pontif.*, p.453; Wahrhaus, *Cron.*, p.246; Unrest, *Kärt.*, p.138; Stainreuter, *Österr.*, p.199; Meisterlin, *Chron.*, p.275
- historiography Galesio (1571); Sardo (1587); Cavitelli (1588); Bonifaccio (1591); Giustinian (ed. 1964); Zagata (ed. 1745-47); Palladio degli Olivi (1660); Mariani (1673); *Chron. Gotwinc.* (1732); De Rubeis (1740); Corner (1749); Verzi (1786-91); Gallicciolli (1795); Di Manzano (1858-79);

- Barozzi (1859); Sini (1865); Bocchi (1873); *Die Regesten* (1877); Putelli (1880); Joppi (1883); Occioni-Bonaffons (1884); Ambrosi (1887); Joppi (1895); Chini and Prati (1897); Marinelli (1898); Majonica (1903); Graësse (1909); Sbuels (1909); Vale (1927, 1931); Saccavino (1930); Battistella (1932); Mantese (1958); Neumann (1971); Bertacchi (1973); Mahlknecht (1976); *Dehio-Handbuch* (1981); Corbanese (1983-87); Bona (1985); Andreolli *et al.* (1991); Brozzi (1993); Clonfero (1995); Rossi (1997)
- literature* Hoernes (1878, 1901); Hann (1903); Radics (1903a, 1903b); Reindl (1903); Radics (1904, 1908); Ambraseys (1976); Zani (1979); Drimmel (1980); Borst (1981); Giorgetti (1981); Gentile *et al.* (1984); Gentile *et al.* (1985); Borst (1988); Degasperis *et al.* (1991); Margottini and Kozák (1992); Hammerl (1994a, 1994b); Gutdeutsch and Lenhardt (1996); Guidoboni *et al.* (1997); Stucchi and Camassi (1997); Guidoboni (1999)
- catalogues d.* Manetti [1457]; Lycosthenes (1557); Ligorio [1570-71]; Ragor (1578); Bonito (1691); von Hoff (1840); Perrey (1848); Mallet (1853); Suess (1873); Goiran (1880); Reginus (1880); Mercalli (1883); Piovene (1888); Tommasi (1888); De Rossi (1889); Baratta (1901); Schorn (1902); Milne (1911); Zanon (1937); Sieberg (1940); Toperczer and Trapp (1950); *Boschi *et al.* (1995, 1997, 2000)
- catalogues p.* Giorgetti and Iaccarino (1971); Carrozzo *et al.* (1973); Shebalin *et al.* (1974); Postpischl (1985); Camassi and Stucchi (1997); Monachesi and Stucchi (1997-2004); CPTI (1999)
- catalogues Ts* Caputo and Fata (1984)

History of the earthquake's interpretation

Ever since the late Middle Ages, this earthquake has enjoyed considerable fame. It was interpreted as foreshadowing the famous outbreak of the Black Death which depopulated half Europe; and it was followed in Italy by other strong earthquakes in September 1349 (see below): two years of death and destruction, in other words, which remained impressed in the European collective memory for a very long time. The earthquake of 25 January 1348 came to be known in medieval sources as the "earthquake of Villach" (a town in Carinthia, Lower Austria), and our analysis confirms that the epicentral area was indeed in Carinthia. It would therefore seem to fall outside the geographical area covered by this catalogue, but has nevertheless been included because its effects involved a large part of north-east Italy, and because, in our opinion, the damage scenario can provide a partial explanation for the great demographic and social "turbulence" which makes it so difficult to analyse the earthquakes of September 1349.

A brief summary of the interesting history of the earthquake of 25 January 1348 is set out below, for we think it useful in establishing the outline of this particular case study, an understanding of which has advanced amid contradictions and agreements.

The first catalogue to record the earthquake is to be found in a treatise by Giannozzo Manetti [1457], where there are two brief references to it without a clear dating, and the only town mentioned is Villach. Then, from the 16th century onwards, there are numerous prodigy and earthquake lists in which it is mentioned: Lycosthenes (1557), Pirro Ligorio [1570-71], who records it as a "Venice earthquake", Ragor (1578) and Bonito (1691). 19th century catalogues also considered it to be a very strong earthquake, though there are mistakes as to where effects were felt, and a variety of datings. Perrey (1848), for example, dates two earthquakes at Venice to 25 January 1343 and 1347, whereas the areas he gives as having been affected by the earthquake of 25 January 1348 are Bavaria, Friuli, the Carinthian Tyrol and Carniola; and he also associates the city of Basel (Switzerland) with that event, though it was really the earthquake of 1356 which struck Basel. Perrey even added Rome and Naples to the area of effects, but he was confusing our earthquake with that of September 1349. The catalogue of von Hoff (1840) partly follows Perrey, but he adds Villach and dates the Basel earthquake correctly. The information in Mallet (1853) comes largely from Perrey; Hoernes (1878) devoted a whole study to the earthquake; Mercalli (1883) and Baratta (1901) included it in their catalogues in a much abbreviated form, suggesting that the

major area of effects was in Carinthia, at Villach and in the Veneto in general. Later on, Hann (1903) and Radics (1903a, 1903b) published two studies in *Die Erdbebenwarte* – an important journal for seismological studies at the time (published at Laibach, now Ljubljana). It was also dealt with by Sieberg (1940) and Toperczer and Trapp (1950), who thought it was an earthquake at Villach.

The first Italian parametric catalogues, by Giorgetti and Iaccarino (1971) and Carrozzo *et al.* (1973), both of which relied on Baratta (1901), placed the earthquake between Tolmezzo and Paluzza (in the Friuli region). Within an investigation into the Friuli earthquake of 1976, Ambraseys (1976), placed the epicentre of the 1348 event in north-east Friuli. Drimmel (1980) places the epicentre at Villach, and so does Postpischl (1985). The latter relies in fact on the study by Gentile *et al.* (1985), which, however, does not provide a location for the 17 places named in the sources utilised.

As far as basic historical information is concerned, the above-mentioned studies nearly always use the same works of seismological and historical literature, but they do not clearly distinguish between early sources and later historiography.

Not until the study by the medieval historian Borst (1988) do we find a genuine critical and historical review of the event. This work is in fact an Italian translation which includes an earlier study (1981) of his, and it provides us with an accurate and extensive exegesis of the sources. Damage in Austria is contextualised by means of numerous careful references to social and cultural factors, and there are wide-ranging and well-documented references to reconstruction work.

New research within an Austrian context was carried out in the 1990s, and the first results were published by Hammerl (1994a, 1994b: the second of these studies being a summary of the first). They provide a fresh and careful review of the main sources from Germany (18) and Italy (19). The conclusions in Hammerl (1994b) suggest that there has been a substantial overstatement of effects in Austria, it being assumed, but not demonstrated, that the picture in Italy (i.e. in present-day Friuli) should be painted in darker hues. Hammerl (1994b) has provided some valid and interesting points about the way news of the earthquake spread in the German monastic environment, indicating some ways in which the seismological tradition has misinterpreted the sources. But the study somewhat neglects one aspect of the event which is central to historical seismology, namely establishing the location of the effects mentioned in the sources. Although it contains many valuable critical points, it unfortunately only partly solves the complex place name problems presented by the sources utilised. For example, one of the most important contemporary texts from Germany, that of Mathias von Neuenburg, lists 22 localities which suffered serious damage, but Hammerl has identified only 10 of them. And as regards the most reliable source from Italy, the chronicle of Giovanni Villani, which even records a letter from some Florentine merchants, Hammerl identifies only 19 of the 24 places it names.

Perhaps the only drawback to Hammerl's results (1994b) is that they are not definitive, and they have been utilised by Boschi *et al.* (1995), Gutdeutsch and Lenhardt (1996) and Camassi and Stucchi (1997). However, Boschi *et al.* (1995) have carried out a more extensive analysis of the Italian sources, which has led them to *reject* the idea that the area of greatest damage was in north-east Italy (a view which is echoed in their subsequent publications of 1997 and 2000). On the other hand, Camassi and Stucchi (1997) locate the epicentre in north-east Friuli on the sole authority of Hammerl (1994b) and that is what we find in CPTI, 1999, which takes its information from Camassi and Stucchi.

Aims of this review

The survey we offer here goes a good deal further than the research published in Boschi *et al.* (2000) and provides new parameters; but we are aware that these are no more than a few steps in the direction of a total review of the earthquake. In our opin-

ion, further research is required, particularly as regards historical place names, if a satisfactory situation is to be reached and if we are to be in a position to suggest which fault or faults were activated. This is the context in which our review of this great and complex event is placed, and the following are our aims:

- (i) to make a selection of strictly contemporary sources, and to assess intensity on the sole basis of primary sources;
- (ii) to solve some place name problems presented by sources from Germany and Italy;
- (iii) to establish earthquake effects at individual localities, making distinctions, whenever possible, between damage to individual fortified structures (castles, guard towers and fortifications) and damage to walled villages;
- (iv) to clarify the chronological parameters of the earthquake and the sequence of shocks;
- (v) to analyse the substantial environmental effects recorded in the sources, distinguishing between damage caused directly by the earthquake, and that caused by related landslides and flooding.

Criteria used in selecting basic data

In order to make intensity estimates, we used only the most reliable sources and those nearest to the earthquake in time. The selection problem became particularly apparent in relation to chronicle and annal sources: for example, we did not use the chronicle of Detmar (ed. Koppmann 1884), a Franciscan friar from Lubeck who was writing around 1395, though it was used by Hammerl (1994a and b). Nor did we use the information recorded in the *Annali del Friuli* by the count of Manzano — a work which paraphrases an unpublished text by Marcantonio Nicoletti, a 16th century author (but thought by Hammerl 1994b to be 14th century). Although this text can be considered fairly reliable, we excluded it because of our chronological limits. It is on the basis of these *Annali del Friuli* that Monachesi and Stucchi (1997-2000, DOM on the internet, site <http://emidius.mi.ingv.it/DOM/>) include Cividale del Friuli and Flagogna (with an intensity of grade VII-VIII MCS). We did not use Ludovico Cavitelli's work because he is a late 16th century author; but he is used by Hammerl (1994a and b) to assess the Italian localities of Cremona, Lodi and Milan. This was a case where we found two contradictory elements: Cavitelli's text (of which Hammerl gives a translation) refers explicitly to damage ("many earthquake shocks were felt, resulting in the collapse of many buildings in Cremona, where Otto de Bonis was praetor, Lodi, Milan and Venice"). The Latin text reads: *viguerunt multi terrae motus, quibus multa aedificia Cremonae ibi praefatore Ottone de Bonis, Laude, Mediolani, & Venetijs corruerunt*). However, the estimate of effects at the three Italian locations, established on the basis of this source, is given as "felt"; whereas in Monachesi and Stucchi (1997-2004 DOM, deriving from Hammerl 1994b) the intensity at these three places is given as grade IV-V MCS. We found a similar contradiction in the case of Ravenna, the information for which came from Detmar, who was writing around 1395. For the reasons explained above, we excluded that source.

Finally, we did not use the chronicle of Ghirardacci (1596-1657), which records information about the earthquake at Bologna, nor the anonymous *Cronica ad memoriam ad praeteritis temporibus* (ed. 1884) in relation to Vicenza. Although these two texts are reliable sources — especially Ghirardacci, because what he wrote is based on archive documents and early chronicles, now lost — our criterion of using only sources which were close in time to the earthquake meant that they had to be excluded.

This analysis allowed us to situate and assess 18 localities not known to the literature: 3 of them are in Italy (Monte Croce Carnico, Mestre and Noale) and 15 in Austria, Germany and France (Strassfried, Mauthen, Rain, Oberdrauburg, Freising, Gailitz, Hochwart, Krainberg, Neuhaus an der Gail, Oberdrauburg, Rain, Regensburg, Sankt Peter am Wallersberg, Munich and Strasbourg). In order to identify minor localities, we made use of two place name studies: *Dehio-Handbuch* (ed. 1981) and Graesse's *Orbis Latinus* (1909). However, 6 places mentioned by Mathias von Neuenburg are

still unidentified. It is very likely that they are castles or small villages which have now been abandoned or are even in ruins, which means that specific local studies in medieval toponymics or archaeology will be required to identify them.

The damage zone in Slovenia also remains to be clarified. It may have resulted from subsequent shocks. Italy is, of course, more strictly pertinent to this catalogue, and we think there is sufficient established evidence to allow us to *reject* the suggestion that the epicentral area was in Friuli, and to confirm that the area of maximum effects was in Lower Austria (see the map of effects in figg. 83a and b).

Chronology of the shocks

The earthquake of 25 January 1348 occurred between 15:00 and 16:00 UT (between the 16th and 17th hours, local time). This time span can be deduced from the various expressions used in the sources: in most cases the reference is to the hour of vespers (*sole lucescente et claro existente usque post pulsum vesperarum; hora fere vespertina; circa ora de bespero; a hora de vesparo; hora vesperarum; in sull'ora del vespero; in vesperis*). Sunset may also be mentioned (*ad occasum die*) and in one case time is reckoned "in the Italian manner" (*alla ventitreesima ora*) — a system which was beginning to spread at that period. Almost all the contemporary sources make general reference to a single shock, but some make interesting additions, indicating a very close sequence of shocks. Giovanni da Parma, a contemporary author who was at Trento at the time of the earthquake, mentions 2 shocks, specifying that there was first a small one (*parvus*) followed almost immediately (*quasi sine intervallo aliquo*) by a very powerful one. Giovanni di Pordenone, on the other hand, records 3 consecutive shocks at Pordenone at a progressively increasing level of intensity, the first being weak (*debilis*), the second very powerful (*multum magnum*), and the third terrible (*horribilis*).

The sources also provide information as to the duration of the strongest shock, their measurements being based on the time required to recite certain prayers. According to Giovanni da Parma, who was writing at Trento, the strong tremor lasted for three *Lord's Prayers* and three *Hail Marys* (about 70 seconds). Antonio Zuvaro, a notary who experienced the earthquake at Padua, is in approximate agreement: he tells us that the shock lasted as long as it takes to recite distinctly four *Lord's Prayers* (about a minute). Obviously, this is just the human perception of the duration of the tremor, and we cannot exclude the possibility that other shocks occurred during this time span but were perceived as a continuum.

As for the shocks which followed the principal one on 25 January, the information provided by the sources allows us to arrive at relatively few quantitative conclusions, but there are a few interesting items which provide an indication of how the seismic activity proceeded. One item recorded by almost all the primary sources concerns the large number and frequency of the tremors felt immediately after the destructive one; in the terse language of medieval chronicles, the expression used in this connection is: "the earthquake lasted". When Andreas von Regensburg, who was at Villach at the time of the earthquake, stated that it lasted 8 days (*das wert acht tag*), he was probably referring to the sequence of stronger shocks. According to the contemporary *Annales Frisacenses*, tremors were felt in Carinthia for more than 80 days "uninterruptedly", and then, less frequently, for almost a year. In Italy too, and especially at Venice, there is evidence of a period (40 days) of frequently recurring shocks.

More detailed information is available for the tremors felt at Padua. Antonio Zuvaro records in fact that there were six strong shocks between February and May 1348. Austrian sources also record a strong tremor on 2 February 1349 at about 14:00 UT.

General effects of the earthquake

On 25 January 1348, between 15:00 and 16:00 UT (roughly between the 16th and 17th hours, local time) a devastating shock struck southern Carinthia (Austria), causing

almost total destruction at many castles and fortified and other villages in the valleys of the rivers Gail, Drau and Glan and in the areas of Villach and Feldkirchen. Some settlements in eastern Carinthia were also completely destroyed. The worst damage was concentrated in the lower valley of the river Gail, where a landslide set in motion on Mount Dobratsch, near Arnoldstein, by the earthquake, caused the river to burst its banks, thereby adding to the destruction directly attributable to the earthquake itself. The chief village in the valley was Arnoldstein, which suffered the almost complete collapse of its dwellings, church buildings and fortifications. The neighbouring castles and fortified villages of Federaun, Gailitz, Krainberg, Rain, Reifnitz, Neuhaus an der Gail, Strassfried and Wasserleonburg also suffered almost total collapse; and the sources confirm the destruction of numerous other unspecified villages, many of which were probably permanently abandoned and never rebuilt.

There was extensive damage at Villach and the surrounding area at the confluence of the rivers Gail and Drau: at Villach there were extensive total collapses of houses, churches, monasteries and fortifications, including the town walls, and there may have been as many as 5,000 victims. In addition, all the houses collapsed in some hamlets situated outside the town walls, and it seems likely that here too, as in the Gail valley, they were permanently abandoned. Not far from Villach there was total collapse at the castles and fortified villages of Bad Bleiberg, Hochwart and Rosegg. There is evidence that all the houses and the Benedictine monastery collapsed at Ossiach. In the upper valley of the river Gail, Mauthen and Oberdrauburg suffered almost total collapse; and there is evidence of the collapse of the castle of Ortenburg in the upper valley of the river Drau. The sources also record collapses at localities in the valleys east of Villach, as far as the border between Carinthia and Styria. Houses and a monastery collapsed at Feldkirchen; and farther east, the fortified village of Liemberg almost totally collapsed.

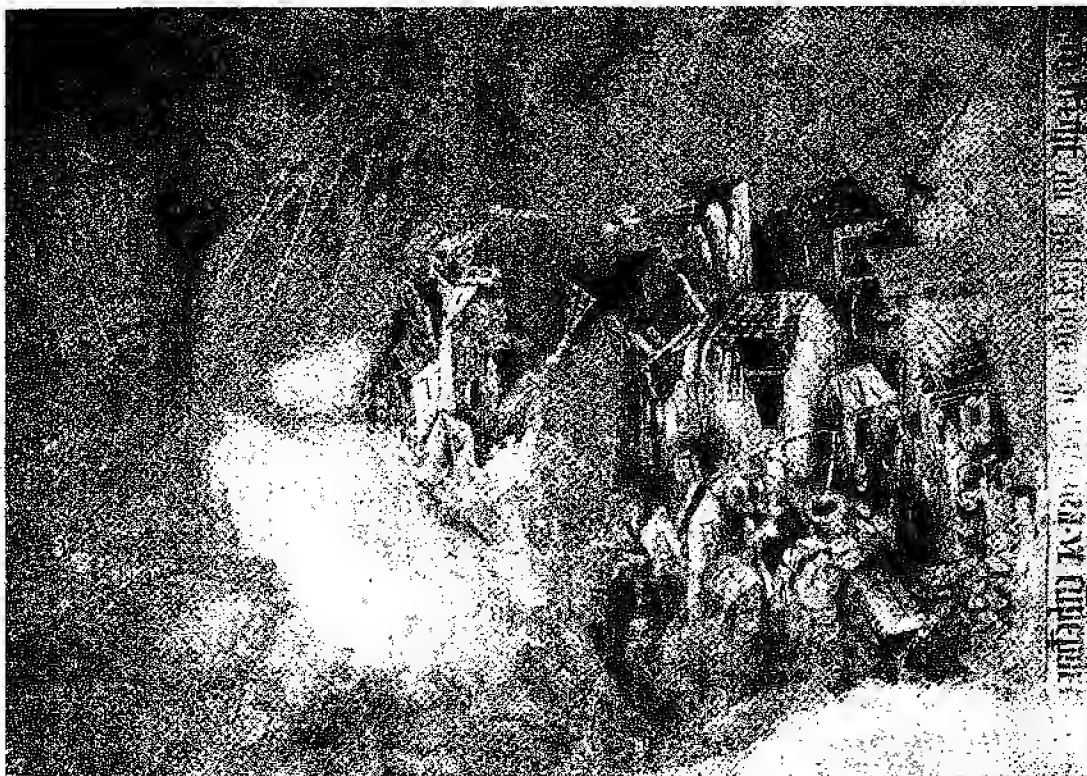


fig. 81 Castle of Karlstein (Bohemia), fresco by M. Wurmster of Strasbourg, dating to 1361-1362: it shows the castle of Arnoldstein during the strong earthquake of 25 January 1348 (from Margottini and Kozák 1992 and web site <http://nisee.berkeley.edu/kozak>).

In the lower valley of the Drau, the fortified villages of Hollenburg, Wildenstein and Sankt Peter am Wallersberg all collapsed; farther to the north east, the fortified village of Waldenstein almost totally collapsed.

There is no record of damage having occurred north of Waldenstein. Many sources — especially those from Germany, emphasise how serious effects were in the north east and south east of Carinthia, in Styria and in Carniola (present-day Slovenia), claiming that they suffered as much damage as Carinthia. At the current stage of our research, however, we have not identified any place names as belonging in Styria or Carniola. The earthquake was felt as far north of the major damage zone as Munich, Freising and Regensburg in Moravia and Bavaria, and as far north west as Strasbourg in Alsace.

The worst damage in Italy occurred in the area along the line of the Alps separating Carinthia and Friuli. In this area, Paluzza and Montè Croce Carnico were almost totally destroyed. In Carnia, Tolmezzo and Gemona del Friuli suffered extensive collapses, involving most houses and some church buildings. There were widespread collapses at San Daniele del Friuli. Many houses collapsed at Venzona, and the cathedral was damaged. We are also told that houses collapsed at Udine, as well as part of the patriarch's palace. Some of the many castles and fortified villages in Friuli either completely or partly collapsed. Aquileia suffered serious damage, for much of the ancient basilica collapsed. Pordenone and Sacile were less seriously affected.

There was damage in the Trentino-Alto Adige Alps as well as in the upper Veneto: 10 houses collapsed at Bolzano, and there was damage to two towers, the roof of a church, and its bell-tower. Many houses collapsed at Trento.

The earthquake also seriously affected the area of the Veneto to the south of the major effects zone. At Venice, in particular, houses and chimneys collapsed and a number of churches were damaged; some old houses also collapsed at Padua. Damage at Treviso, Mestre and Noale can also be attributed in all probability to the earthquake.

The earthquake is also recorded as having been strongly felt, but without damage being caused, at a number of places in Italy, including Verona, where people fled in terror, Vicenza, Mantua, Bologna, Ferrara, Reggio Emilia, Piacenza and Pisa (for a more detailed description of effects at individual Italian localities, see pp.430-2 below).

Environmental effects

Environmental effects were widespread, especially in Carinthia, and, as we have seen, they sometimes aggravated the direct effects of the earthquake. In particular, the sources tell of landslides and rock falls, which caused rivers to burst their banks and lakes to be formed.

Near Arnoldstein, the earthquake activated an immense landslide: the mass of material involved descended for 600-700 m (half a mile), and produced what is described as an "enormous production of smoke" (*maximus fumus exivit*) but was probably dust. The detritus obstructed the course of the river Gail, causing the formation of an expanse of water (*lacus*) about 3 km (2 miles) long, in which 18 villages were submerged.

Wasserleonburg was swept away in another nearby landslide. In the mountains around Federaun and Rain more landslides resulted in the destruction of 50 villages (*villae*). North of Villach, along the valley of the river Ahrer, landslides obstructed the course of the river, creating an expanse of water about 16 km (10 miles) long: about 60 castles and villages were destroyed either by the landslides themselves or by being submerged in the water.

At Ossiach the lake overflowed as a result of a landslide on the nearby mountains. Near Freising (in Bavaria, Germany) the earthquake caused such turbulence in river waters that their courses were altered, and in some cases they burst their banks. Spring waters became cloudy.

In the main square at Villach, a crack appeared in the ground, out of which came sul-

phurous water and, in addition, the water in wells became cloudy and its taste so unpleasant that it was undrinkable.

At Venice, the water in the Grand Canal and other canals became so turbulent that it struck against each side of the banks, rising high enough to allow the canal bottom to be seen free of water.

Historical sources

The corpus of primary sources (sources 1) analysed and selected by us consists of 9 documents (5 from Italy and 4 from Austria), 59 texts of chronicles and annals (22 from Italy and 37 from Austria) and 2 letters (from Italy). From amongst these texts we have chosen those which in our opinion contribute most to clarifying the picture of effects in Italy. We therefore present here transcriptions of 4 documents and 14 items of evidence taken from the most reliable chronicle sources and from letters. We have also brought to light 4 inscriptions preserved in ecclesiastical buildings.

Archival documents

The four documents from Austria were first analysed by Borst (1988), and have been published in the *Monumenta Historica Ducatus Carinthiae* (ed. Wiessner 1968, nos. 340, 640, 867 and 981). Two of them concern tax exemptions granted (and twice extended: in 1351 and 1380) to the citizens of Villach, since their financial resources were taken up by the reconstruction of their city, which had been damaged in the earthquake. These provisions show that reconstruction was taking quite a long time. The other two documents are grants of ecclesiastical income to the church of Arnoldstein for the reconstruction of buildings which had been destroyed in the earthquake. Here too, the dates of the documents (1364 and 1391) show that reconstruction work in the worst affected area lasted for many years.

AUSTRIA

The documentary research which we carried out at this stage was confined to Italy and carried out at the Archivio di Stato in Venice, *Senato* collection, Misti series. A large part of the area struck by the earthquake was in the Venetian hinterland and belonged to the Republic of Venice. Unfortunately, however, there are large gaps in Venetian documentation for this period; but our archive research did bring to light a number of documents which may relate to reconstruction work following the 1348 earthquake. There is unfortunately no explicit reference to the earthquake in these documents, but 24 decisions (*deliberazioni*) taken by the Venetian Senate in the period 1348-1356, provide evidence of damage and collapses affecting various buildings and military outposts in the Venetian hinterland. Because of the lack of specific reference to the earthquake, we have taken into consideration as evidence of earthquake damage only those documents which are close in time to the 1348 event, namely the following two provisions concerning Treviso, Mestre and Noale made by the Senate in April and May 1348. On 23 April 1348, the Senate gave three *provisores* the task of carrying out a survey of the Treviso area in order to establish the extent of the damage (Archivio di Stato, Venice, *Senato*, Misti, reg.24, fol.71):

ITALY

"Set out below is the advice of the noblemen Marco de Molino, Giorgio Ermolao and Leonardo Contarini, sent as *provisores* to the Treviso area by order of the doge. [...] Since some mills at Treviso have been destroyed and can therefore no longer grind, the above-mentioned noblemen advise that these mills be restored at once to working order, and that the town in which they are situated play its part in ensuring that they are better maintained in the future".

Infrascripte sunt provisiones consulte per nobiles viros dominos Marcum de Mollino, Ermolaum Georgio et Leonardum Contareno ex ducali mandato provisos missos ad partes trevisane. [...] Cum quidem pistrini qui sunt in castro predicto Tarvisii sint

dirupti et male in acconcio nec macinare possint consulunt etiam supradicti quod statim dicti pistrini reparentur ut macinare possint et ut melius conservarentur cohoperiatur locus in quo manent [...].

On 8 May 1348, the Senate decreed that two *provisores* should establish the extent of the damage to the castles of Mestre and Noale:

"Set out below is the advice of the noblemen Giorgio Ermolao and Leonardo Contarini for the preservation and protection of the castles of Mestre and Noale.

For the castle at Mestre. One hundred larch planks to be sent to repair the missing archers' platforms at Mestre castle, [...] and any other wood or iron materials required [...] and the above-mentioned person shall salvage as far as possible anything left over from the above work. For Noale. Since urgent steps need to be taken to provide for the safety and defence of Noale castle".

Infrascripte sunt provisiones cunsulte per nobiles viros ser Hermolaum Georgio et ser Leonardum Contareno pro conservacione et defensione castrorum Mestre et Noale.

Capta. Pro castro Mestre. Quod mittantur pro aptacione et reparacione ballistreriam que deficiunt in castro Mestre tabula C de larese et [...] et si aliud lignamine et feramentum esset necessarium [...] predictus faciat recuperari deinde sicut melius poterit quod laborerium supraditam facere [...]. Capta. Pro castro Noale. Cum sit solicite providendum ad securitatem et defensionem castro Noale.

The following two additional documents, which we consulted in critical editions, concern earthquake damage to the basilica at Aquileia and matters of reconstruction.

A decision made in 1351 by the patriarchal Chapter at Aquileia (published in *Codice diplomatico istriano* ed. Kaendler 1986, pp.1245-6). The Chapter was made up of the senior prelates and Friulan dignitaries who assisted the patriarch in governing his territory. This document records the rejection by the Dean and Chapter of Aquileia of the agreement drawn up by the patriarch Nicolò and duke Albert of Austria concerning the customs post (*muda*) at Chiusa (now Chiusaforte). The agreement recognised the rights of the Archduke of Austria over that post, but the Chapter claimed that customs duty income should be returned to them because it was needed to finance restoration work at the basilica in Aquileia, which had almost completely collapsed in the earthquake:

"On the twenty-third of May [1351]

The above-mentioned patriarch in the presence of the Noble Soldier Enrico Raspone, [...] has questioned the above-mentioned Dean of Aquileia and has requested him and the Chapter of Aquileia to exhibit and append the seal of the Chapter to the agreement set out above. But the said Dean replies that having conferred with the Chapter and his colleagues about this problem, they have replied that this [agreement] seems excessively harsh and unjust, because Chiusaforte was granted to the Church of Aquileia in antiquity for the construction of Aquileia's own church, which now requires not merely repair but complete rebuilding from its foundations, having collapsed in ruins in the earthquake. But if the Lord duke were to adhere to the above-mentioned agreement concerning Chiusaforte, the church would never be rebuilt, or at least not for a long time. [...] Given in Udine, at the palace of the patriarch".

Die XXIII mensis Maii [1351]

Prefatus Dominus. Patriarcha in presentia Nobilis Militis Dni. Henrici Rasponis [...] requisivit Dominum. Decanum Aquilegensem predictum sibi que precepit ut ipse ac ejus Capitulum Aquilegense consensum et sigillum ipsius Capituli exhibere et apponere deberent pactis superius expressis. Dictus vero Decanus respondit quod ipse super hujusmodi requisitione contulerat cum dicto ejus capitulo et concanonice suis, et quod ipsi responderant quod hoc videbatur nimis durum pariter et injustum, eo quod muta Schluse [Chiusaforte] fuerat antiquitus Aquilegensi Ecclesiae concessa pro fabrica ipsius Ecclesie que ad presens indiget non solum reparacione, verum etiam totali hedificacione

a fundamento supra, cum dirupta sit et corruerit propter terremotum. Que quidem ecclesiam, si dictus Dominus Dux tenere deberet juxta pacta premissa Mutam Sclusae, numquam vel saltem temporibus suis rehedificaretur. Actum Utini, in palatio patriarchali.

A letter from pope Innocent VI sent to the patriarch of Grado in 1354 (in Joppi 1895, pp.249-51): the pope asks for information about the state of the basilica at Aquileia, which had not been used for worship since the time of the 1348 earthquake, in which it was severely damaged:

"That church itself, so noble and so solemn, and the holy relics which have for so long been stored within it lack the veneration which is due to them, and although divine worship has not been discontinued, it has suffered neglect through fear of death and danger, and the piety of the people has grown cold, just as everything there seems desolate, and about six years have now passed by since the church building collapsed because of an earthquake shock. The result has been that the said worship, veneration and prayer, have almost completely ceased, and yet there can be no hope of rebuilding it on the same spot, since that appears extremely difficult and even a waste of time for the reasons stated above [...] Given at Avignon, on 14 March, in the second year of our pontificate [1354]"

Ecclesia ipsa tam nobilis, tamque solemnis, et in ea repositae sacre Reliquiae iamdiu veneratione debita caruerunt, cultus inibi divinus non affectato defectu, sed metu mortis et periculorum huiusmodi neglectus extitit, populi devotio tepuit, ac demum, ut omnia ibidem desolatione pariter occurrere videantur, ipsius Ecclesiae machina, sexennio vel circiter iam transacto, et concussione corruit terremotus, propter quod etiam cultus, veneratio et devotio supradicti ibidem quasi totaliter cessaverunt, iis etiam adiecto, quod de reedificatione ipsius Ecclesiae in eodem loco, qui ex premissis causis nimis difficilis et demum inutilis prorsus existeret, spes nullatenus sit habenda [...] L.S. Datum Avenione II Idus Martii, Pontificatus Nostri anno secundo.

Annals and chronicles

There is evidence of the earthquake of 25 January 1348 in many chronicles and memoirs, both in Germany and Italy. In order to survey them clearly and in detail, these sources are grouped below according to their area of provenance. First come 11 sources from the Austro-German area, the most important of which, in terms of the quantity and quality of the information they provide, are monastic annals. The survey then continues with a detailed presentation of sources from Italy. These are divided into sections: the general but detailed accounts in the chronicles of Giovanni and Matteo Villani; and local chronicles, listed according to the place where they were written (and bearing in mind present-day Italian regions).

Within the corpus of these sources, the following provide the most detailed information. AUSTRIA AND GERMANY

Monastic annals and chronicles (in order of proximity to the maximum effects area):

Annales Frisacenses (ed. Weiland 1879);

Annales Sancti Stephani Frisigenses (ed. Waitz 1881);

Annales Mellicenses. Continuatio Mellicensis (ed. W.Wattenbach 1851);

Annalium Mellicensium Continuatio Novimontensis (ed. W.Wattenbach 1851);

Annales Zwetlenses (ed. W.Wattenbach 1851);

Annales Zwetlenses. Continuatio Zwetlesis IV (ed. W.Wattenbach 1851).

The *Gesta Bertholdi* in the chronicle of Mathias von Neuenburg, bishop of Strasbourg (ed. Hofmeister 1924-40). As Hammerl (1994) suggests, he was in a position to gather detailed information about the maximum effects area since, as Grand Master of the Teutonic Order, he was in contact with members of the order at Friesach.

The memoirs of canon Andreas von Regensburg (ed. Leidinger 1903). Although he

lived later than the earthquake (1380-1438), he managed to gather reports from merchants who were at Villach when the earthquake struck.

Contemporary evidence as to where the earthquake was no more than felt in present-day Germany and France.

The annals of the Benedictine abbey of Friesach (*Annales Frisacenses*, ed. Weiland 1879, p.67) contain this text:

"In the year of our Lord 1348, on 25 January, which is the feast of the Conversion of St. Paul and fell on the sixth day of the week [Friday], towards the hour of vespers, there occurred such a great and terrible earthquake throughout Alemannia — but especially in Carinthia and Styria — that on that same day the famous town of Villach collapsed, as did many castles and churches. It lasted without interruption for more than 80 days, never ceasing to shake the earth for a single night, remaining quiescent or giving an occasional shock during the day; but it then went on to last for almost a year. It was an amazing event, worth narrating down the generations. When the above-mentioned town of Villach collapsed, nearly all the inhabitants were buried, barely one in ten of them surviving. It was so powerful that in various places mountain peaks were thrown down into the valley, and rivers [*aquarum fluentium*] were obstructed. For many days they flowed in the reverse direction, hence completely submerging all the nearby villages. When the waters receded, river crossings were seen to have been cleaned out in many places, and where water had never been seen before there were now lakes of considerable size, and some springs gushed forth copiously. In that same year, great thunderclaps came from the heavens and killed many people, and there was also a plague".

Anno Domini 1348, octavo Kalendas Februarii, hoc est in die conversionis sancti Pauli, que tunc in sexta feria occurrebat, hora fere vespertina factus est terremotus tam magnus atque terribilis per totam Almanniam, maxime autem per Carinthiam et Styriam, adeo ut egregia civitas Villacensis multaque castra ac ecclesie eadem die corruerent; et duravit plus quam 80 diebus continue, ita quod una noctium movere non cessavit, in die autem semper quievit vel rare pulsavit, successive vero per annum pene duravit. Mirum autem enarrandum a progenie in progenies. Cum civitas prefata Villacensis corruit, pene omnes habitatores eius oppressit, et inter omnes incolas suos decimus homo vix remansit. Fuit itaque tam fortis, ut etiam cacumina in pluribus locis ad valles proiiceret et aquarum fluentium transitus obstrueret, et retrorsum pluribus diebus dederunt meatum, et retrorsum fluendo omnes villas ibidem adiacentes totaliter submerserunt; post recessum vero purgatis transitibus in plerisque locis, ubi nusquam ante vise sunt aque, lacus non modici remanserunt et fontes aquarum largissime effluerunt. Eodem etiam anno tonitrua magno de celo venerunt, que homines non paucos occiderunt, factaque est illo anno pestilentia.

The annals of St. Stephen of Freising (*Annales S. Stephani Frisingenses*, ed. Waitz 1881, p.59) tell us in detail how that town was affected, though it is more than 200 kilometres from the maximum effects area:

"In the year of our Lord 1348, on the feast of the Conversion of St. Paul the Apostle, with the sun still shining brightly until after vespers was rung, the sky suddenly clouded over and there came a violent earthquake such as had not occurred or been seen or heard since the Passion of Christ. We saw tall and masonry-built houses shake violently, as did churches as well, and windows rattled very loudly because of the movement, and forest timbers, including those lying on the ground, struck against one another, and watercourses wandered in any direction, overflowing their banks because of the earth movement, and at the same time we saw very clear waters become cloudy, while men, almost out of their minds and with aching heads, wandered the streets, unable to stand still. We also heard church bells ringing of their own accord because of the earthquake".

Anno domini 1348, in die conversioni sancti Pauli apostoli, sole lucescente et claro existente usque post pulsum vesperarum, statim die facto nubilo, est factus terre motus tantus, qui a passione Christi numquam auditus vel visus est aut fuit. Vidimus domos altas et muratas pariter et ecclesias se fortissime moventes et vitra propter motum sonos maximos facientes, ligna silvestria et stancia in terra se invicem concuciencia, fluxus veros aquarum errantes et extra littora sua propter motum terre exeuntes, et aquas limpidissimas vidimus turbidas et homines hac hora quasi amentes capita dolentes, euntes in via errantes, stantes stare non valentes, Audivimus insuper ob motum talem campanulas in ecclesiis dependetes se pulsantes.

Given the richness and variety of the corpus of sources from north of Villach, our survey has inevitably paid particular attention to the principal ones relating to the damage zone, but we also thought it worth recording the above item of evidence from what was only a felt area, because of its clear and detailed reference to seismic effects.

The *Annales Mellicenses. Continuatio Mellicensis* (p.513) contain this text:

"On the day of the feast of the Conversion of St.Paul almost at the hour of vespers, there was a great earthquake, and in Carinthia the town of Villach disappeared as well as many other towns and villages with their inhabitants. And in that same year so great a plague spread in Italy and Provence that scarcely one man in twelve survived; and there were also many fires. [...] On the feast of the Purification of the Blessed Virgin [2 February 1349] there was a great earthquake.

In festo conversioni sancti Pauli, hora quasi vespertina, terremotus factus est magnus, et in Karinthia Villacum et plura civitates et castra cum hominibus perierunt. Item eodem anno tanta pestilencia invaluit in Ytalia et in Provincia, quod vix duodecimus homo remansit; incendia etiam plurima fuerunt. [...] In festo purificationis beate virginis terremotus factus est magnus valde.

The information recorded in the *Annalium Mellicensium Continuatio Novimontensis* (pp.674-6) is almost solely concerned with effects at Villach:

"1348. On the day of the feast of the Conversion of St. Paul, at the hour of vespers, there was a dreadful universal earthquake; and the one place where it was most violent and cruel and most in evidence was the city of Villach. For at the time when men had gathered in churches for prayer, the buildings collapsed in a single movement and those who were in them perished. This exceptional shock completely demolished the city wall and all the buildings, and all those people were killed who, because of their number, did not succeed in swiftly escaping the falling buildings; and it demolished sturdy fortified buildings and neighbouring villages".

1348. *In die conversionis beati Pauli hora vesperarum universalis motus terre terribiliter emersit; et in uno loco vehemencior ac crudelior extitit, sicut in Villaco civitate evidencius fuit ostensum. Nam cum in ecclesiis causa devocionis homines convenissent, in uno impetu structuris corruentibus, hii qui aderant mox extincti sunt. Murum eciam civitatis et cuncta edificia concussio nimia penitus subvertit, et homines absque numero qui non poterant celeriter a ruina fugere, simul interierunt; et firmas circumiacentes municiones et villas precipitanter evertit.*

The contemporary *Annales Zwetlenses* (p.684) were written in the monastery at Zwettl, north west of Vienna, and describe effects in the worst hit area:

"[1348] On the day of the feast of the Conversion of St.Paul, there came the worst earthquake known to our age. For in Carinthia, Styria and Carniola, as far as the coast, it destroyed more than 40 very strong castles and towns, and it threw one great mountain against another in an extraordinary way, and so obstructed flowing water there that several villages were submerged. [1349] In that same year, on the fourth

day before the Nones of February, which is to say on the feast of the Purification of the Virgin [2 February], there was a great earthquake at the ninth hour".

[1348] *In conversione Sancti Pauli factus est terre motus ita magnus, quem nostra etas non meminit. Nam Carinthia, Styria, Corniola usque ad mare plus quam 40 firmissima castra et civitates subvertit, et mirum modum montem magnum super alium montem proiecit, et ibi aquam fluentem obstruxit, qua etiam plures villas submersit. [...]*
[1349] *Eodem anno 4 Nonae Februarii, hoc est in die purificationis beate Virginis, factus est terremotus magnus hora nona.*

Similar information is to be found in the *Annales Zwetlenses. Continuatio Zwetlesis IV* (p.686), which were also compiled at Zwettl:

"On the day of the feast of the Conversion of St. Paul, there occurred the greatest earthquake in living memory. For in Carinthia, Styria and Carniola, as far as the coast, it destroyed 40 very strong castles and towns, and it caused one mountain to fall on to another in a strange way, and it so obstructed the flow of water that it swept away and submerged many villages".

In conversione sancti Pauli factus est terremotus ita magnus quem quis hominum meminit. Nam in Kharinthia, Styria, Carniola, usque ad mare plus quam 40 firmissima castra et civitates subvertit, et mirum in modum mons magnus super montem cecidit, et aquam quadam fluentem obstruxit, que etiam post se villas plures subvertit et submersit.

Mathias von Neuenburg (ed. Hofmeister 1924-40) mentions the 1348 earthquake in two works – the *Gesta Bertholdi* and the *Chonica* – but it is only in the *Gesta Bertholdi* that detailed information is provided. The subject of the *Gesta* is Berthold of Buechek, bishop of Strasbourg. Mathias says that he was provincial master of the Order of St. Mary of the Teutons in Alemannia, and a man of great erudition and mildness, being regarded as one of the finest orators in the whole of Germany for sermons in the vulgar (*comendatorem provincialem Alamannie ordinis sancte Marie Theutonicorum, qui sapiens valde et mitis in omni Germania in vulgari sermoni eloquencior dicebatur*). The *Gesta* tell us that:

"Furthermore, in the days of this bishop, in the year 1348, in January, on the feast of the Conversion of St. Paul, there was an earthquake of great power and intensity, as a result of which men seemed to be quite dazed. The earthquake struck a number of places and lasted for many days. In Carinthia, in particular, many castles were destroyed. Thus that of Osterburg in the Steintal valley collapsed, as did Lentzeburg [Mauthen], Rosach [Rosegg], Ortemberg [Ortenburg], Waldenberg [Sankt Peter am Wallersberg], Schellenburg and Schwartzenburg [Hochwart]. The famous city of Villach collapsed with all its walls, cloisters and churches, and twenty thousand people perished there. Similarly, Waldenstein, Wildenburg [Wildenstein], Hohenburg [Hollenburg], Wartenburg, Remmetze [Reifnitz], Tranburg [Oberdrauburg], Krancke [Krainberg] and Lumburg [Liemberg] all collapsed, with people and property involved. And likewise, a mountain situated in the same area – the one opposite Lowenburg [Wasserleonburg] village – collapsed and moved half a mile, causing an enormous emission of smoke, after which a lake two miles wide was formed and drowned 18 villages. Similarly the castle of Landenburg, which stands on a height in the same valley, was carried two miles by the force of the water, and first a mountain collapsed, together with the villages of Nuwenburg [Neuhaus an der Gail], Gutenowe, Gutenberg, Bemburg [Bad Bleiberg] and Geilenstein [Gailitz], and then a mountain peak collapsed bringing with it trees, stones and houses. For the same reason, incredible things also happened in many other places".

Huius etiam episcopi temporibus anno Domini MCCCXLVIII. In mense Ianuario in die conversionis sancti Pauli factus est terre motus generalis et magnus, ex quo homines

pati syncopim putabantur. Qui terre motus et in aliquibus locis multis diebus duravit. Presertim in Karinthia multa castra subversa sunt. Nam in valle Steintal castrum Osterburg cecidit; Lentzeburg et Rosach ceciderunt; Ortemberg, Waldenberg, Schellenburg, Schwartzenburg ceciderunt; civitas magna nomine Villach cum omnibus muris, claustris et ecclesiis suis cecidit, ibique duodecim homines perierunt. Item Waldenstein, Wildenburg, Hohenburg, Wartenburg, Remmetze, Tranburg, Krancke, Lümburg omnia ceciderant cum hominibus et rebus. Item mons quidam in eadem provincia, qui iacet prope castrum Löwenburg, cecidit, transferens se per dimidium miliare a loco proprio, unde maximus fumus exivit, ibique lacus factus est per duo miliaria, qui submersit villas XVIII, item castrum Landenburg situatum super quodam monticulo in eadem valle per impetum aque portatum est per dimidium miliare, et tunc primo cecidit mons et castrum Nüwenburg, Gutenowe, Gutenburg, Bemburg, Geilenstein, ibi cecidit mons super montem cum arboribus, lapidibus et domibus. In multis etiam locis aliis ex hoc incredibilia evenerunt.

The memoirs of Andreas von Regensburg (ed. Leidinger 1903) gleaned important items of information about the effects of the earthquake at Villach from some German merchants. Here is what they had to say in the original Early New High German version:

“Villach destroyed, including the walls of the fortress, the monastery and churches and that, with the exception of 11 merlons, all walls and towers collapsed. In the middle of the town the earth split open and water stinking of sulphur broke forth and flowed off again. In Carniola and Carinthia, the fortress of Kellerberg, the monastery of Arnoldstein and 36 other castles were destroyed. There were landslides and the dammed up water devastated an area of more than ten miles. The earthquake lasted for 8 days and created crevasses deep enough to swallow a man up to his belt”.

daz Villach dy stat, purchmaur, chloster und chirchen und all maur und turn uncz an 11 zinne auf di erde vielen, und das sich das ertreich enmitten in der stat enzway spielt und ein wasser daraus vran recht als der swebel und prast wider in dy löcher in das ertreich. Und in Chrayen und in Chärten niderviel Chelerberch dy vest und Arnoldstain und darzu 36 vest, und die perg vielen zesamme in die teler, das sich das wasser verswelt, das es verdirbt lant und laüt und gut 10 meil lanch. Das wert acht tag, das sich das ertreich erscharant und spielt, das ein man darein viel uncz an dy gürtel, als ob er versinkchen wolt.

There is contemporary evidence of the earthquake in what is now Germany and France. The first-hand evidence of a Florentine merchant (published in Stolz 1957, p.35) who was in Munich (Lower Bavaria) at the time shows that the earthquake was felt there. He records having felt the shock as he was making a payment: “1348 – 4 florins which I paid in Munich in front of the city while there was an earthquake”.

1348 – 4 florenos, quos dedi in Monaco ante urbem, quando terre motus erat.

Konrad von Megenberg (ed. Pfeiffer, p.109) records that the earthquake was felt at Regensburg:

“Of the earthquake in Carinthia around the city of Villach: it was during the year 1348 since the birth of Christ, on the day of the feast of the Conversion of St. Paul, when a great many people in that city died and churches and houses collapsed, and even a mountain fell against another; the earthquake occurred towards evening and was so powerful that it went beyond the Danube as far as Moravia and also towards Bavaria as far as Regensburg, and it lasted for more than 40 days, by which I mean that after the first shock, progressively smaller ones kept coming for many days and weeks”.

von wârhait geschâhen grôzeu dinch von dem erpidem in Kârnden ze der stat Villach, dô man zalt von Christi gepürt dreuzehnhundert jâr; dar nâch in dem aht und vierzigistem jâr an sant Pauls tag als er bekêrt wart, wan gar vil lâut verdurben in der vorgeantent stat und vieln diu münster nider und diu häuser und etswâ ain perg auf den andern, wan der erpidem was umb vesperzeit und was sô stark und sô grôz, daz er sich raicht unz über die Tuonawe in Märhern und aufgên Paiern unz über Regenspurch und werte mê dann vierzig tag, alsô daz nâch dem êrsten ie ain klainr kom dar nâch über etswie vil tag oder wochen.

The earthquake was personally experienced at Strasbourg by Frietsche Closener, who declares in his *Chronik* (ed. Hegel, p.136):

"In the year 1348, on the day of the feast of St. Paul [25 January], as night approached there came an earthquake which was felt at Strasbourg, but did no damage. But we are told that it caused great damage in other towns".

Do man zalt 1348 jar, an sant Pauls dage noch winnahtenn, do kam ein erbidem der zu Strosburg merkelich waz und doch nüt schedelich. Aber doch in andern landen det er grossen schaden alfe man seite.

ITALY There are many references to the earthquake in Italian sources. Above all, there are the chronicles of Giovanni and Matteo Villani. Important detailed information is also preserved in reliable local chronicles, which we have grouped below according to their regions of provenance, which can be identified with the following present-day regions Friuli, Veneto, Trentino-Alto Adige, Lombardy and Emilia-Romagna.

In his *Nuova cronica* (ed. Porta, vol.3, pp.562-6), Giovanni Villani records important information which he had obtained, he tells us, from some merchants who had been travelling at the time of the earthquake between Sacile and Carinthian villages to the north of Villach. The long passage in his chronicle which deals with the earthquake must therefore be considered a very important piece of evidence for establishing the effects of the seismic events of 1348:

"Of the great earthquakes which occurred in Venice, Padua, Bologna and Pisa

In that year, on the night of Friday 25 January, there were numerous very severe earthquakes in Italy: in the cities of Pisa, Bologna, Padua, and especially in Venice, where a great many of its numerous beautiful chimneys collapsed; and church towers and other buildings in these cities split open, some of them collapsing. And these things brought damage and plague to these areas, as you will find if you read on. But the most dangerous shocks were felt that night in Friuli and in the city of Aquileia, as well as in parts of Germany. They were of such a kind and so destructive that they would seem incredible if described in spoken or written words; but to provide a true and accurate account in this treatise, we will set out a copy of a letter which certain reliable Florentine merchants sent from there, and we will explain the tenor of their letter, written as it was and dated at Udine in the month of February 1347 [Incarnation style 1348].

Of great earthquakes which occurred in Friuli and Bavaria

You will have heard of the various dangerous earthquakes which occurred in these countries, causing very severe damage. In the year of our Lord 1348 according to the church calendar, but still 1347 in our Annunciation calendar, on Wednesday 25 January, the feast of the Conversion of St. Paul, at eight and a quarter hours towards vespers, which is the fifth hour of the night, there was a tremendous earthquake lasting for more than two hours, unlike any known to living memory.

First of all in Sancille [Sacile] the gate towards Friuli collapsed completely. Part of the patriarch's palace in Udine collapsed, together with other houses. The castle of Santo Daniello in Frioli [San Daniele del Friuli] collapsed, and a number of men and

women were killed. Two towers of the castle of Ragogna collapsed and slid down to the river called the Tagliamento, and a number of people were killed. More than half the houses in Gelmona [Gemona del Friuli] collapsed in ruins, and the tower of the principal church cracked and broke open, and the stone figure of St. Christopher split from top to bottom. Spurred by these miraculous events and by fear, the moneylenders of the place repented and announced that everyone to whom they had lent money at interest should go to them to get it back; and they continued giving it back for more than a week. Half the town bell-tower at Vencione [Venzone] cracked, and a number of houses collapsed. The castle of Tornezzo [Tolmezzo] and those of Dorestagno [Arnoldstein] and Destrafitto [Stassfried] almost completely collapsed in ruins, and many people were killed there. The castle of Lemborgo [Wasserleonburg], which is in the mountains, was shaken. As it collapsed, it was moved ten miles from its original position by the earthquake, and was completely destroyed. A very large mountain, near the road leading to Lake Dorestagno [Arnoldstein], split open and half of it completely collapsed, blocking the road in question. And the two castles of Ragni [Rain] and Vedrone [Federaun], with more than fifty villages, situated by the *contado* of Gorizia, on either side of the river Gieglija [Gail], were reduced to ruins and buried under two mountains, and almost all the inhabitants perished. In the town of Villach in Friuli, all the houses collapsed, except for that of a virtuous and just man, full of Christian charity. And in the surrounding area, more than 60 castles and villages above the river Atri [Afriz] were similarly reduced to ruins and buried under two mountains, and the valley where the river ran for more than 10 miles was filled in; and the monastery of Orestano [Arnoldstein] was reduced to ruins and submerged, and many people died there. And since this river had lost its exit and usual course, a large new lake formed on top. Many strange things happened in the town of Villach. A cross-shaped crack appeared in the main square, and out of the crack there came first blood and then a great quantity of water. And in the town church of S. Jacopo 500 men who had taken refuge there were found dead, and there were many other victims in the town, amounting to more than three quarters of the inhabitants; but by a miracle, Latins, people from other parts and the poor escaped with their lives. In Carnia, more than 25,000 people were killed in the earthquake; and all the churches in Carnia collapsed, and the houses and the monastery of Osgalche [Ossiach] and Verchir [Feldkirchen] were all reduced to ruins.

In Bavaria, in the town of Trasborgo [Oberdrauburg], as well as at Paluzia [Paluzza], La Muda [Mauthen] and La Croce [Monte Croce Carnico] beyond the mountains, most houses collapsed, and many people were killed. And the reader should note that all the above earthquake damage and danger is a great sign and judgement from God. Its great cause lies in God and in the prediction provided by those miracles and signs which Jesus Christ, as he preached the gospel, gave to his disciples as due to appear at the end of time".

Di grandi tremuoti che furono in Vinegia, Padova e Bologna e Pisa

Nel detto anno, venerdì notte XXV di gennaio, furono diversi e grandissimi tremuoti in Italia nella città di Pisa, e di Bologna, e di Padova, maggiori nella città di Vinegia, nella quale ruvinarono infiniti fummatuoli, che ve ne avea assai e belli; e più campanili di chiese e altre case nelle dette città s'apersono, e tali ruvinarono. E significarono alle dette terre danni e pestilenze, come leggendo inanzi si potrà trovare. Ma i pericolosi furono la detta notte in Frioli, e inn-Aquilea, e in parte della Magna, sì fatti e per tale modo e con tanto danno, che dicendolo o scrivendolo parranno incredibili; ma per dirne il vero e non errare nel nostro trattato, si ci metteremo la copia della lettera che di là ne mandaro certi nostri Fiorentini mercatanti e degni di fede, il tinore delle quali diremo qui apresso, scritte e date inn-Udine del mese di febraio MCCCXLVII.

Di grandi tremuoti che furono in Friuli e in Baviera

Avrete udito di diversi e pericolosi tremuoti che sono stati in questi paesi, i quali hanno fatto grandissimo danno. Correndo gli anni del nostro Signore, secondo il corso della chiesa MCCCXLVIII, indizione prima, ma secondo il nostro corso dell'Anunziazione, ancora del MCCCXLVII, a dì XXV di gennaio, il dì di venerdì, il dì della conversione di san Paolo, ad ore VIII e quarta appresso vespro, che viene ore V infra la notte, fu grandissimo tremuoto, e durò per più ore, il quale non si ricorda per niuno vivente il simile.

In prima in Sancille la porta di verso Friole tutta cadde. Inn-Udine [sic] cadde parte del palazzo di meser lo patriarca, e più altre case; cadde il castello di Santo Daniello in Frioli, e morivì più uomini e femmine; caddono due torri del castello di Ragogna, ed iscorsono infino al Tagliamento, cioè uno fiume così nomato, e morivì più gente. In Gelmona la metà, e più delle case sono rovinate e cadute, e 'l campanile della maggiore chiesa è tutto fesso e aperto, e lla figura di san Cristofano intagliato in pietra viva si fesse tutta per lungo. Per li quali miracoli e paura i prestatori a usura della detta terra, convertiti a penitenzia, feciono bandire che ogni persona ch'avessono loro dato merito e usura andasse a lloro per essa; e più d'otto di continuarono di renderla. A Vencione il campanile della terra si fese per mezzo, e più case rovinarono. Il castello di Tornezzo e quello di Dorestagno e quello di Destrafitto caddono e rovinarono quasi tutti, ove morirono molte genti. Il castello di Lemborgo, ch'era in montagna, si scommosse; rovinando fu trasportato per lo tremuoto da X miglia del luogo dov'era in prima, tutto disfatto. Uno monte grandissimo, ov'era la via ch'andava al lago Dorestagno, si fesse e partissi per mezzo con grande rovina, rompendo il detto cammino. E Ragni e Vedrone, due castella, con più di L ville, che sono sotto il contado da Gurizia, intorno al fiume di Gieglija, sono rovinate e coperte da due monti, e quasi tutte le genti di quelle perite. La città di Villaco in Frioli vi rovinarono tutte le case, se non fu una d'un buono uomo, e giusto, e caritatevole per Dio. E poi del suo contado più di LX sue tra castella e ville sopra il fiume d'Atri per simile modo detto di sopra sono tutte rovinate e somerse da due montagne, e ripiena la valle onde corre il detto fiume per più di X miglia; e 'l monastero d'Orestano rovinato e somerso, e mortavi molta gente. E 'l detto fiume non avendo sua uscita e corso usato, al di sopra ha fatto uno nuovo e grande lago. Nella detta città di Villaco molte maraviglie v'apariro, che lla grande piazza di quella si fesse a modo di croce, della quale fessura prima uscì sangue e poi acqua in grande quantità. E nella chiesa di Santo Iacopo di quella città si trovarono morti D uomini che v'erano fuggiti, senza gli altri morti per la terra, più delle tre parti degli abitanti; iscamparono per divino miracolo i Latini e' forestieri e' poveri. Per Carnia più di XV M[ila] uomini sono trovati muorti per lo tremuoto; e tutte le chiese di Carnia sono cadute, e lle case e 'l monistero d'Osgalche e quello di Verchir tutti sobbissati.

In Baviera la città di Trasborgo, e Paluzia, e lla Muda; e lla Croce oltramonti, la maggior parte delle case cadute, e morta molta gente. E nota, lettore, che lle sopradette rovine e pericoli di tremuoti sono grandi segni e giudici di Dio, e non senza gran cagione e premessione divina, e di quelli miracoli e segni che Gesù Cristo vangelizzando predisse a' suoi discepoli che dovieno apparire alla fine del secolo.

The *Cronaca* of Matteo Villani (ed. Porta, vol. I, p. 88) supplements the information provided by his brother Giovanni in the *Nuova Cronica*:

"At this same time [1348], there was a town called Villacco [Villach] on the German border in a pass above a valley, with villages and castles having as many as 12,000 inhabitants. It is on the border with Slavonia, and this town with its villages and castles collapsed into the valley in the earth shocks, and many inhabitants were killed. And since the place is in the pass leading from Friuli to Slavonia, and is fertile country, and its dwellings are all made of wood, which is in great abundance there, it was quickly rebuilt and occupied again. And within a year of its being rebuilt, the whole place was

burned, which suggests that no small punishment was being meted out to its inhabitants. But because the place is fertile and useful for the pass, it was quickly rebuilt and made more handsome than before”.

In questo medesimo tempo, essendo a l'entrare della Magna sopra una valle una città ch'ha nome Villacco, in sul passo, con alquante villate e castello che tenieno bene XII miglia, a' confini della Schiavonia, questa terra colle sue ville e castella per li terremuoti s'atuffò nella valle, con grande danno di morte di suoi abitanti. E però che il luogo è sul passo del Frioli e Schiavonia, e pase ubertoso, e i suoi alberghi tutti si fanno di legname, che ve n'ha grande abondanza, fu tosto rifatto e adabitato. E inanzi che l'anno fosse compiuto dal suo rifacimento, per fuoco arse tutta la terra, che ffu a pensare non piccolo giudicio di suoi abitanti. Ma per lo fertile luogo e utole per lo passo, in brieve tempo fu redificata la terra più bella che prima.

An important source for the effects of the earthquake at Pordenone is the *Supplemento di Giovanni figlio di Odorico di Pordenone* in Bianchi (1844, pp.56-7). This 19th century scholar was a canon at Udine. In his *Documenti per la storia del Friuli* (1844) he published a *Memoriale di Odorico notajo e Maestro di Pordenone*, covering the years 1292-1332, together with a *Supplemento*, which is a continuation for the years 1347-1350. The *Supplemento* records:

“1348. On 25 January, the feast of the Conversion of St.Paul, after the ninth hour, an earthquake struck three times in succession. The first shock was weak, the second was very strong, and the third was dreadful. In fact, four large capitals on our bell-tower fell down, and a child was killed. Everybody was astonished and disturbed. Eight naves collapsed, and most were swallowed up. Its effects were felt from towns on the coast to towns near the mountains, and it affected the whole of Italy. The earthquake also struck Alemannia, but I say nothing of that because I know little about it”.

MCCCXLVIII. Die xxv. Januarii, in conversione Divi Pauli post Nonam. Regnavit subcessive terremotus tribus vicibus. Prius fuit debilis, secundo fuit multum magnum, horribilis tertius subsecutus. Nam quatuor capitella grandia nostri Campanilis fuerunt submissa, et mortuus fuit quidam pupillus. Omnes persone stupuerunt et conturbate fuerunt. Naves octo demisse, et majori parte ingulate fuerunt. Tantum in civitatibus sitis juxta mare regnavit, tandem in Civitatibus sitis juxta montes, et hoc fuit in tota Italia. In Alemania regnavit multum dictus terremotus, sed taceo quia non bene novi.

Detailed information appears in the *Cronaca Veneziana* attributed to Gasparo Zancaruol (Biblioteca Nazionale Marciana, Venice, class VII, codex 1275=9275/1-2), whose text may have been used and translated into Latin by Lorenzo Monaci, a Venetian citizen living in Crete in the late 14th century, who wrote a *Chronicon de rebus Venetiis ab urbe condita ad annum MCCCLIV* (ed. Corner 1758). In the chronicle attributed to Zancaruol, we read:

“at the hour of vespers a terrible earthquake shook the whole place very severely, so that men and women flung themselves to the ground, and it seemed intent on killing them. At that time the bells of S.Marco rang of their own accord. The north side and the middle part of the roof of the church of S.Basilio collapsed in ruins, as did the top of the bell-towers of S.Silvestro, S.Vitale and S.Giacomo dell'Orio. The bell-tower of S.Angelo leaned to one side and remained in that position. And from then on, the earth shook for many days and nights. [...] This experience demonstrated that earthquakes do less damage in Venice than in other cities.

a hora de vespáro uno teribile moto comosse senza exemplo tutta la terra, intanto che l'uno e l'altro sexo per paura putato a terra pareva che li volesse morir. allora le

campane de San Marcho per sé sonarono. Cascharono insulita rovina el sinistro lato et tuta la sumità del mezo della chiesa di S.Basilio et de la sumità di campanili de San Silvestro et de San Vitale et de S.Iacomo de l'Orio. El campanele de Sancto Anzolo se piegò incanto et cusi romase. Et da poi per molti dì et note la terra tremò. [...] La experientia demonstrò che li terremoti manco nocero in la città de Venexia che in le altre città.

The 14th century manuscript *Cronaca di Venezia* preserved in the Biblioteca del Museo Civico Correr in Venice (*Manoscritti Cicogna*, 1063) records:
"1347 [Venetian style; 1348 modern style]. When Andrea Dandolo was doge, on 25 January, there was a very great earthquake which lasted for approximately 15 days and almost all the pregnant women miscarried. In the same year a severe plague occurred"

1347. Dogando messer Andrea Dandolo adi 25 zenaro, fu uno terremoto grandissimo che durete per 15 zorni o pocho o assai et quasi tutte le donne si dispersero che erano gravide. Successe nel medesimo anno una crudel peste.

An interesting contemporary source is the *Chronicon Monasterii Sancti Salvatoris Venetianarum* (p.69) by Francesco de Grazia, who records earthquake effects at Venice in some detail:

"In January 1348, on the day of the feast of the Conversion of St.Paul, at the twenty-first hour, there was so great and terrible and incredible an earthquake that many houses and countless chimneys collapsed, bells rang of their own accord, and the earthquake travelled from south to north. The great dome of the church of S.Marco was cracked. The church of S.Silvestro collapsed, together with its bell-tower and bells. The bell-tower of S.Giovanni di Rialto collapsed, as did the new church of the Franciscans, the oculus of the church of the Carmelite friars, the pinnacle or small dome of the bell-tower of S.Angelo, S.Vitale, and two arches of the arsenal, and one of its walls was cracked. And the water in the Grand Canal and small canals was so amazingly disturbed that one could see the waterless bottom because the water flowed to each side. And the earthquake lasted for a good half hour. A certain town in Germany called Villach was completely destroyed, and now a great lake is to be found there. And at the same place a castle was taken from one mountain to another almost three miles away".

M.CCC.XLVIII. XXV. Jan. in die conversionis s.pauli, hora XXI. diei, fuit terremotus magnus et terribilis, et incredibilis, in tantum quod multe domus et camini innumerabiles corruerunt, campane a se ipsis sonaverunt, et ibat terremotus de austro versus tramontana. Chuva magna ecclesie s.marci scissa est. Ecclesia s.Silvestri cum campanille et campanis corruit. Campanile S.iohannis de rivoalto, ecclesia nova fratrum minorum, oculus ecclesie fratrum carmelitarum, pigna seu cava campanilis s.angeli, s.Vitalis, duo archi arsenatis [arsenalis?] corruerunt, et murus ipsius scissus est. Et aqua fuit ita mirabiliter exagitata in chanali magno et in rivis, quod visus fuit fundus in medio eorum sine aqua, quia aqua ibat modo ad unam partem. Et duravit terremotus bene per dimidiam horam. Quedam civitas alemanie que vocabatur vilach funditus est submersa, et modo est ibi lacus magnus. Ibi prope, unum castrum de uno monte fuit transportatum super alium montem qui distat fere per tria millaria.

Evidence of particular importance for the city of Padua is provided by the notary Antonio Zuvaro (or Zupario). Zuvaro was a cleric, a notary and, from 1343 onwards, a *mansionario* at the bishop's *curia* in Padua. As the editor of his work, Paolo Sambin (1959), suggests, his death was probably caused by the plague of 1348. The evidence he provides about Paduan affairs in the first half of the 14th century consists of a series

of notes found by his editor amongst the notarial deeds which he had drawn up. In other words, this is not a complete chronicle, but a number of scattered notes gathered together by Sambin. The importance of the text lies in its detailed description of the earthquake of 25 January 1348 and effects at Padua, and in the record it provides of the subsequent shocks. Zuvaro writes:

"In 1348, in the first indiction, on Friday 25 January, the feast of the Conversion of St. Paul, at the hour of vespers, while the psalm *O Lord, thou hast searched me and known me* was being sung in the church of Padua, at the line *Surely thou wilt slay the wicked, O God*, there came a tremendous earthquake which lasted so long that it would have been possible to recite the Lord's Prayer four times quite distinctly. It was more powerful than any other earthquake at any time and in human memory, and all the priests fled from the choir into the cloister, and the lord bishop of Padua and his family took refuge in his garden. After almost half an hour there was another minor shock, which many reliable witnesses claim to have felt and which lasted as long as a Hail Mary, but I did not feel it myself. During the earthquake, a piece of marble a cubit long and nearly as wide, situated at the top of the church of Padua above the roof, over the altar of S. Daniele, fell down and, because of its rounded shape, it rolled down the tiles and fell on to the upper roof of the principal sacristy, after which it rolled on to the lower roof of the same sacristy, breaking many tiles, and then fell and thrust itself into the ground on the threshold of the house of canon Venturino, which is opposite the said sacristy; and there it came to rest. Similarly, the lower part

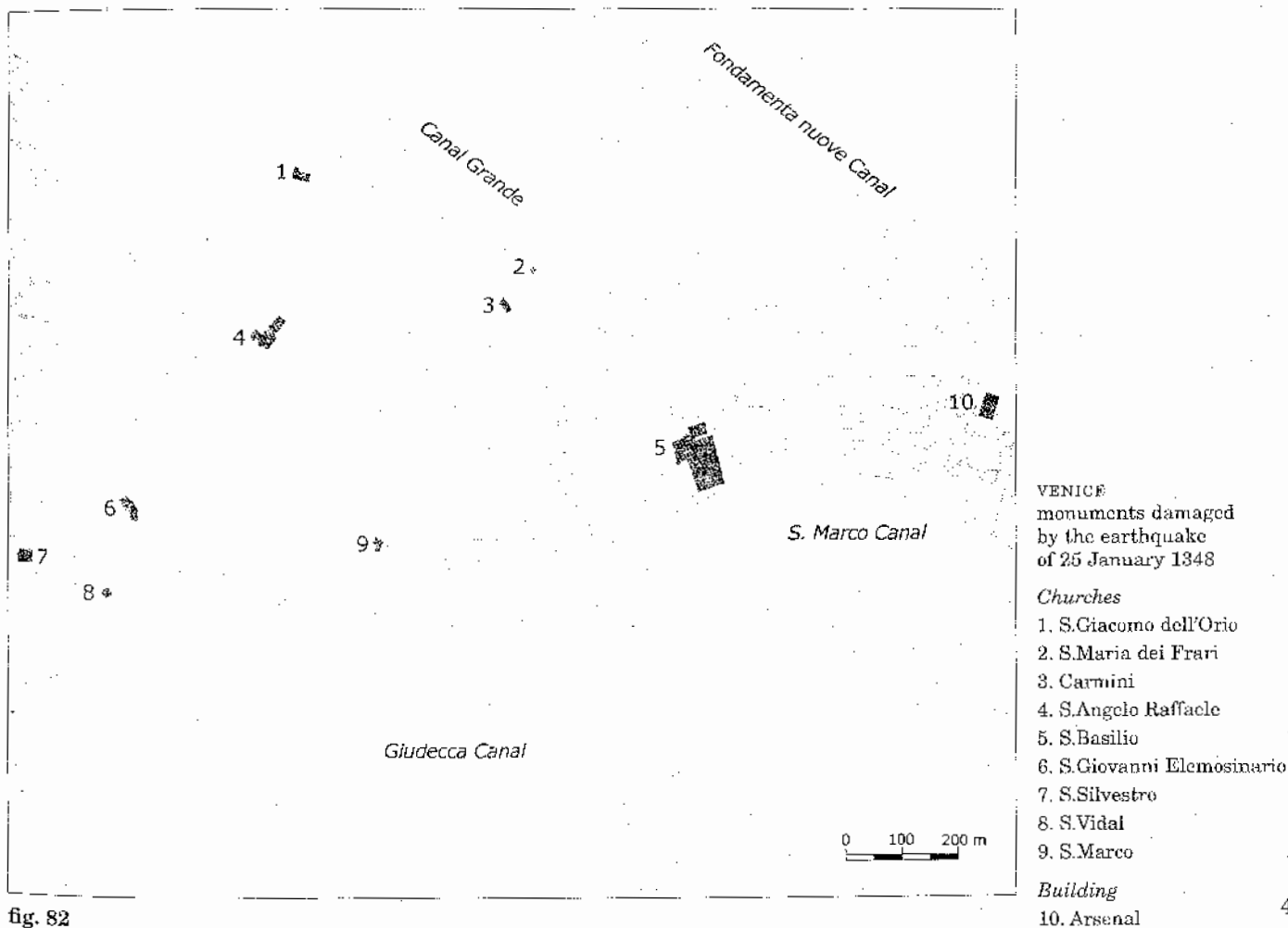


fig. 82

of the red tower of the commune of Padua [the tower of the *palazzo consiliare*] was severely damaged and left leaning heavily to one side, with the result that, on expert technical advice, it was demolished and arrangements made to rebuild it immediately. Similarly, the central part of the church of Ss. Ermagora e Fortunato in Aquileia collapsed and was destroyed. Likewise in Venice the tops of many church towers collapsed, as did a number of chimneys. In the city of Padua itself, some chimneys collapsed, as did also some old houses with poor foundations. May God be blessed for all these things, for he is mindful of the earth and makes it shake. In the same year, during the night between Thursday 7 February and Friday 7 [8?] of the same month, there was a strong but brief earthquake after the fifth hour, and at the same hour there was another long but weak earthquake, and again towards the sixth hour there was a brief and weak earthquake. The following night at about the ninth hour there was another weak and brief earthquake. On the following Saturday, therefore, a meeting of clergy was called, and the bishop of Padua ordered that prayers should be said during mass, such as [blank space]. Similarly, on Tuesday 12 of the same month, in the morning, towards the end of the thirteenth hour, there was another weak and brief earthquake. And so all peoples and kings were in fear of the glory of God, who alone is capable of producing wonders. In the same year, on Monday 2 May, at the end of the twenty-fourth hour, there was a brief earthquake lasting as long as it takes to recite half a *Hail Mary*".

MCCCXLVIII, indictione prima, die veneris XXV ianuarii in festo conversionis S. Pauli hora vesperarum, dum in ecclesia Paduana cantarentur vespere et in psalmo: Domine probasti me cantaretur versus: "Si occideris Deus peccatores", fuit maximus terremotus per tantum tempus, quo possent bene legi distincte quatuor "Pater noster", et fuit maior quam fuerint unquam temporibus, de quibus extat memoria. Fugeruntque omnes sacerdotes de coro in claustrum et dominus episcopus Paduanus cum familia fugit in ortum suum. Post mediam quasi horam fuit alius terremotus parvus, quae multi fidedigni dixerunt se sensisse, et duravit per unum "Ave Maria", quem ego non sensi. In quo terremotu quidam lapis marmoreus longus uno cubito et paulo minus latus, qui erat in capite ecclesie Paduane super tectum, super altare S. Danielis cecidit et propter sui rotunditatem descendit per tegulas et cecidit super superiorem tectum sacristie maioris deindeque super inferiorem tectum eiusdem sacristie et, fractis tegulis multis, cadens in terra intravit hostium domus domini Venturini canonici, que est ex opposito dicte sacristie, et ii quievit. Item scissa est turris rubea comunis Padue in parte inferiori et aliquantulum obliquata, ita quod consilio phisico destructa est, reparanda statim. Item ecclesia Aquilegensis Sanctorum Hermacore et Fortunati pro medietate corruit et destructa fuit.

Item in civitate Venetiarum multe summitates campaniliorum et plurima camina ceciderunt. In civitate quoque Paduana aliqua camina corruerunt et alique domus male fundate et vetuste ceciderunt. Per omnia benedictus Deus qui respicit terram et facit eam tremere. Eodem anno in nocte veniente post diem iouis 7 february et ante diem veneris 7 ipsius mensis post quintam horam fuit terremotus magnus et brevis et in eadem hora fuit alius terremotus longus et parvus fuit quoque infra eandem horam sextam tertius terremotus brevis et parvus. In nocte vero proxima sequenti circa nonam horam noctis fuit alius parvus brevisque terremotus.

Propter quod in die sabbati proxime sequenti per dominum episcopum Paduanum, convocato clero, ordinatum fuit, quod dicerentur orationes in missa, videlicet [blank space]. Item die martis 12 eiusdem mensis in mane, circa finem 13 hore fuit alius parvus et brevis terremotus. Et sic timebant gentes et omnes reges gloriam Dei, qui facit mirabilia solus.

Millesimo eodem, die lune 2 maii in fine vigesime quarte hore fuit terremotus brevis quantum diceretur medium "Ave Maria".

Zuvaro provides better details of damage effects, for they are only partly recorded in the *Liber regiminum Paduae* (in "Miscellanea di storia veneta", s.II, tomo 6, 1899, pp.88, 164) and not mentioned at all in the contemporary chronicle of Guglielmo Cortusi (*Historia de novitatibus Padue et Lombardie*, cols.926-7).

In the *Liber regiminum Padue* we read as follows:

"But the said tower of the commune, because of a very great earthquake at Padua and other places in 1248 [1348], on Friday 25 January during vespers, was so badly damaged that it had to be completely rebuilt. [...]

And in that year a terrible plague spread across the whole of the East, killing countless people, and neither Italy nor any of the West succeeded in avoiding this evil, and in the year 1348, on 25 January at the twenty-third hour there was a great earthquake which lasted for half an hour, after which a terrible plague came across the sea".

Sed dicta turris comunis propter maximum terremotum factum in Padua et aliis locis MCCXLVIII die veneris XXV ianuarii in vesperas adeo concussa fuit quod oportuit totam rehedificare. [...]

Cum in dicto anno pestis horrenda totum orientem invasisset cum innumerabili mortalium cede; et ne Italia, ac universum Occidens hoc malum fugeret, in annis MCCCXLVIII die XXV ianuarii hora XXIII fuit ingens terraemotus qui duravit per dimidium horae, post quem pestis inaudita mare transivit.

Conforto da Costoza (ed. Steiner, p.11) provides evidence of the earthquake having affected Vicenza:

"In the year 1376, as the night approached Wednesday 12 March, towards morning, there was such a great earthquake that everyone thought it no less powerful than the one on the feast of St.Paul in 1348".

MCCCLXXVI, nocte veniente ad diem mercurii 12 marcii, circa matutinum diei, increpuit tam admirabilis terremotus, quod ab omnibus creditus fuit non minor qui in die sancti Pauli 1348.

That the earthquake was felt in Verona is recorded by an exceptional witness, the humanist Francesco Petrarca (Letter to Guido Sette, archbishop of Genoa, ed. Bigi 1963, pp.960-3), who wrote as follows in a letter which, although dating to twenty years after the earthquake, displays his usual accurate memory:

"Twenty years have now gone by since 1348 (two scourges began in that single year) when, on 25 January, towards evening, our Alps, which Virgil says are not accustomed to shake, and the whole of Italy and much of Germany shook so violently that the inexperienced, for whom this was a completely new and unimagined experience, thought the end of the world had come.

At the time, I was sitting alone in my library in Verona, and although I was not entirely ignorant of such things, I was taken by surprise, and when the earth shook beneath my feet and then books came tumbling down and fell apart, I was amazed, and when I came out of my room I saw my servants and everybody else fleeing in panic, their faces deathly pale".

Vigesimus annus est nunc (unum enim mali utriusque principium fuit) ex quo Alpes nostre, quarum motus insolitos ait Maro, octavo die Kalendas Februarias tremuere, inclinata iam parumper ad occasum die, Italiaeque simul ac Germanie pars magna contremuit tam vehementer, ut adesse mundi finem inesperti quidam crederent, quibus insueta prorsus et numquam cogitata res erat. Verone tunc in bibliotheca mea solus sedens, quamquam non in totum rei nescius, repentina tamen et nova re percussus, solo tremente sub pedibus et undique concursantibus ac ruentibus libellis, obstupui, et egressus thalamo familiam moxque populum trepidissime fluctuantem vidi. Omnium in ore funereus pallor erat.

The effects of the earthquake at Verona are also recorded in the *Notae Veronenses* (ed. Cipolla 1890, p.475), though with a slight mistake in the month:

"1348. In the month of February in that year, on the day of the feast of St. Paul, there was a great earthquake at Verona and throughout the world, at the conjunction of the two planets Mars and Saturn".

M.CCC.XLVIII. Illo anno in mense februarij, in festo sancti Pauli, fuit terremotus magnus in civitate Veronense. Et per totum universum orbem, et fuit coniunctio duorum planetarum, scilicet Martis et Saturnj.

Trentino-Alto Adige There is a contemporary Tyrolean chronicle from Bolzano, the *Bozner Chronik* (in Schorn 1902, pp.117-8) which records earthquake effects in the worst affected area and describes damage at Bolzano:

"On the evening of Friday, 25 January, the feast of the Conversion of St. Paul, at the sunset hour, around vespers, there was an earthquake throughout the world, and in some towns it was so powerful that it cut both mountain and valley, and so great was it that I am unable to narrate or describe in writing one thousandth part of it. In particular, the earthquake reduced to ruins the town of Villach in Carinthia, destroying its surrounding walls and all its buildings and churches and killing five hundred people there, and in particular many people were killed as they listened to a friar's sermon; and the same earthquake which caused houses to collapse in Villach turned the water black in the wells and the water had such a bad taste that nobody could remain there, and a mountain collapsed near the town of Villach, falling into an expanse of water which overflowed and many people were drowned, and villages, people and property were submerged and people fled into the mountains, taking their possessions with them. The same earthquake caused the collapse of the walls of the fortress of the count of Ortnburg together with the mountain.

The same earthquake also caused the collapse of ten houses at Bolzano as well as the tower at Wagnergasse which opened up with a crack as wide as a Bolzano *braccio*, as hundreds of people saw, and after the earthquake the crack in the tower closed up so much that one could only insert two fingers into the space. And an unstable block of stone fell on to the church at Bolzano, which cracked from top to bottom, as far down as a string course. And the tower of my lord Conrad cracked on the tomb side. And the earthquake happened while vespers was being sung and as the bright sun was setting. In the year of Our Lord 1348, in January".

Item es kam ein epignn VII tag in den ianarii am freytag vom sannd pauls abent der pekerung umb vesper zeit über ale die welt unnd was an etlichen stettn also gross, das er perg unnd tal zu samem schnet das ich hie nicht den tausentn tail gesagn mag nach geschribn sunderlich warf denn erdpign nyder villach ain stat ist gelegen in Kärnder rinkhmaur und alles gemeur unnd alle Kichn unnd verfiellen V hundert menschen in der selben stat und besunderlich verfiel grose volkh zu dem parfüssern an einer predig unnd der selb erdpign der warff in der selben stat villach auff zwen hays prunen schwarzes waser und schmachten so fast das niemandt kain weil dapey möcht peleibn unnd fiel ain perg auch danider pey der stat fillach unnd fiel in ain wasser das die geyl unnd üswalt das wasser das ess hinter sych gie und ertrenkh vil leut unnd dörfer unnd etwan volck flach auff dy perg mit leib und mit guett der selb erpign der warff nider deun graffn von ortnburg ir festen etliche mit deu pergn etliche dem gemeur.

Item der selbig erpign warff nider zu Botzn X heuser unnd den turn in wagnergassn der erklab sych von ainer gueten potzner elln weit das sachn über hundert menschn und nach dem erpidn gieng der turn wider zusammen das man kem zween finger darein möcht legn und der wendl stain zu der pfar kirchn zu Botzn der klob sych von oben herab untzt auf das vierd gaden unnd hern Chunrats thurn auff dem graben klab sych an zwayen euden und geschach dy weil man vesper sanng und dy weyl es erpydnns da was es finster pey scheinnder sunen. Anno rev. dm. MCCCXLVIII jarn.

Damage caused by the earthquake at Trento is recorded in the reliable *Cronaca* of Giovanni da Parma (in Pezzana 1837, vol.1, appendix, p.50), who was in the city when the earthquake struck. He records:

"All those willing to listen should know that in the year of our Lord 1348, in the first indiction, on 25 January, which is the feast of the Conversion of St. Paul, at the hour of vespers, there was a minor earthquake, and almost immediately afterwards there was another so powerful that the tower of S. Maria [in Trento] leaned at such an angle that the bells at the top rang of their own accord; and the water in the baptismal fonts overflowed for a while. Many "episastors" [a corruption of the word *epicaustoria*, i.e. chimneys] in houses collapsed, as did many whole houses, and this earthquake lasted long enough for me to have recited carefully three Lord's Prayers and three Hail Marys.

In this connection some people from other parts have said that the palace in Udine of the patriarch of Aquileia half collapsed, and that a river in Alemannia flowed backwards because its course was obstructed by a mountain landslide, and that many people were killed in other places. All these things happened because of the earthquake, and it is said that many even more disastrous things occurred, but I am not in a position to write about them".

Notum sit omnibus, qui audire voluerint, quod anno Nativitatis Domini 1348 indictione prima, die 25 januarii, scilicet in die conversiones S. Pauli, hora vespertina fuit unus terraemotus parvus, et quasi sine intervallo aliquo, fuit alius tantae vehementiae, quod campanille de S. Maria hinc inde taliter plicatum fuit, quod campanae quae super ipso sunt a se ipsis pulsatae fuerunt; aquae quae erant in baptisterii pro certo fusae fuerunt. Multa Episastoria domorum ruerunt, sic et multae domus, et duravit iste terraemotus per tantum horae spacium, quod morose dixissem ter pater et ter Ave Maria.

Adhuc majora dicebantur ab illis, qui de extraneis partibus veniebant, quod palatium de Utino Domini Patriarchae Aquilejen. per medium ruit, et unus fluvius, qui est in Alemannia, retrogressus est propter impletionem cujusdam montis, qui in dicto fluvio ruit, et in aliis partibus multae personae mortuae fuerunt, et haec omnia propter terraemotum, et multa alia dicebantur multo majora, quae scribere non potui.

In relation to Mantua, Aliprandi Bonamente (p.132) records:

Lombardy

"Before going on, I must mention / that on the feast of St. Paul [25 January 1348] at the twenty-first hour there came / an earthquake, greater than any experienced since then".

Innanzi che più passi, voio dir aloe / lo di di san Polo a vintiuna ora vene / un terremoto, non fu mazor dopoe.

In the *Statuti di Mozzanica* (Mozzanica is in the present-day province of Bergamo) there is a verse composition by Giovanni di Leve which records the earthquake (Archivio di Stato, Milan, *Diplomatico*, Statuti, cartella II, fol.16v.):

"In the year of the Incarnation 1347 [1348, modern style], in the month of January on Friday 25 / at the hour of vespers the earth shook with great rage / and towers and buildings trembled throughout the world / and men prostrated themselves on the ground in great fear. I, Giovanni di Leve, from my own knowledge, when the earth / shook, composed these verses and wrote them in my own hand".

Ab incarnatione Anno M septem cum trecentum / quatragesimo de mense Ianuarii die veneris vigesimo quinto / In hora vespere terra tremuit cum furore pleno / Turres et casamenta tremuerunt In orbe toto / Homines In Terra cadebant expauriti de timore magno.

Ego Iohannes de Leve ex mea propria siencia quando terra / tremuit dictos carminos feci et ex mea propria manu scripsi.

Emilia-Romagna The *Chronicon Placentinum* by Giovanni Mussi (p.499) records:

"In 1348, during the night following Saturday 24 January, there was an earthquake at Piacenza".

Anno Christi MCCCCLVIII, die sabbati XXIV Ianuarii, nocte sequenti fuit terraemotus in Civitate Placentiae.

The chronicle *Polyhistoria* is traditionally but wrongly attributed to Bartolomeo da Ferrara (col.806): the text records earthquake effects at Ferrara. The author was in fact Nicolò da Ferrara (Andreolli *et al.* 1991, pp.183-4), who wrote:

"In that same year 1348 on 25 January at about the hour of vespers there was a very great earthquake in Ferrara. It was also felt at the same time and on the same day in many other areas, especially in Carinthia, where it completely destroyed the town of Villach".

Nel medesimo anno MCCCXLVIII a dì 25 gennaio circa l'ora di vespro fu in Ferrara un grandissimo tremuoto, che fu sentito a dì e ora suddetti in molte altre parti, e massimamente in quelle di Carentana, dove la città di Villach tutta fu pel detto tremuoto sommersa.

At Bologna, there is evidence for the earthquake in the contemporary chronicle of Pietro and Floriano Villola (vol.II, pp.583-4):

"In the said year [1348], on 25 January, the day of the feast of the Conversion of St. Paul, very near the hour of vespers, there occurred so great and fierce an earthquake that expressions of horror appeared on people's faces; at that same time the earthquake was very strong in Venice, where houses and the church of S.Marco were badly damaged".

In lo dito millesimo [1348], dì XXV de genaro lo dì de conversio' San Polo, e fo in vegniri su l'ora del vespro, vene [a Bologna] lo teramoto grande e fero; e plu che quaxe tute le persone se cambiano forte in volto, e grandiximo fo in quell'ora in Vinexia e grande nuvità gle fo in le loro caxe et in San Marcho.

The *Leggendario del Monastero di Santa Chiara* at Modena (Archivio di Stato, Modena, *Manoscritti della Biblioteca*, 162, fol.42v.) there is a manuscript compiled by different authors in the 14th-16th centuries, containing information about monastery property and certain events thought to be worth recording. In it the Poor Clares have left a slightly fanciful and generic record of the earthquake, no damage in their town being mentioned: "In the year of Our Lord 1348, in the month of January, on the day of the feast of the Conversion of St.Paul, at the hour of Vespers, in good weather, there came a very great earthquake and in many towns it caused the collapse of houses and palaces and towers, and similarly at various places in the mountains it moved castles from one position to another".

Anno Domini M.CCC.XL.VIII de mense Ianuarii in conversione sancti Pauli hora vespertina, sereno tempore venit quidam maximum terremotus et in multis civitatibus domos ac palatia et turres obruit similiter et castra in montibus in pluribus partibus de loco ad locum movit.

At Modena, there is evidence for the earthquake in the *Annales veteres Mutinenses* (col.82), but with a slight mistake in the date:

"In the year 1348, on Thursday 26 January, there was a great and general earthquake, and on Thursday 7 February, at night, there was another great earthquake. And there came the disease which they call "inguinal".

De anno MCCCXLVIII die XXVI Ianuarii die Jovis fuit magnus et generalis terraemotus et die VII februarii die Jovis de nocte fuit etiam magnus terraemotus. Et fuit morbus, quem inguinarium appellant.

The *Chronicon Regiense* (col.66), compiled by Sagacino Levalossi and Pietro Gazata, men-

tions the earthquake at Reggio Emilia, where there was evidently no damage:
"1348, 25 January, There was an exceptional earthquake throughout the world at
Vespers. [...] The earthquake destroyed many towns".

*MCCCXLVIII. die XXV. Januarii factus est terraemotus in Vesperis ultra modum per
totum Mundum. [...] Terraemotus multae Urbes deiecit.*

Inscriptions

There is evidence of this earthquake in four inscriptions, one of which is at Villach and AUSTRIA
the other three in Italy: at Venice, Costozza and Aquileia. Quite the most interesting
and detailed is the one in Venice, in which the record of the earthquake of 1348 is fol-
lowed by a description of the Plague.

■ 1 - Villach, church of James (published in Hoernes 1901, p.69). The inscription
refers to Villach and the city of Basel, but confuses two earthquakes (it was in 1356
that Basel was struck):

"I tell you that in 1348 there was an earthquake on the day of the Conversion of St. Paul
which damaged the city of Basel and the castles of Villach"

*Sub M. C. triplo quadraginta octo tibi dico
Tunc fuit terrae motus conversio Pauli
Subvertit urbes Basileanum castra Villaci*

■ 2 - Venice, lunette of an internal portal in the former Scuola Grande della Carità: ITALY
inscription in gold letters which was placed there in the years immediately following
the earthquake. It records both the earthquake itself and the serious outbreak of the
plague which came a few months later. The effects of the earthquake are recorded in
these terms:

"In the name of Almighty God and the Blessed Virgin Mary. In the year of the
Incarnation of our Lord Jesus Christ 1347 [Venetian style; 1348 modern style] on 25
January on the feast of the Conversion of St. Paul at about the hour of vespers there
was a great earthquake in Venice and almost throughout the world and the tops of
many bell-towers and houses and chimneys collapsed, as well as the church of
S. Basilio; and so great was the fear that almost everybody thought they were going to
die, and the earth continued to shake for about 40 days; and after this a great plague
began and people died of various diseases and from various causes; some spat blood
from their mouths and some had swellings under their armpits and ears, while the skin
of others became dark, and it seemed that these diseases passed from one person to
another, that is to say from the sick to the healthy. And people were so frightened that
fathers did not want to be with their sons, nor sons with their fathers; and these deaths
continued for about six months and it was commonly said that two thirds of the people
of Venice had died"

*In nome de Dio eterno e de la Biada Vergene Maria. In l'ano de la Incarnacion del nos-
tro signor miser Iesu Christo MCCCXLVII a dì XXV de çener lo dì de la conversion de
Sen Polo, cerca ora de bespero fo gran taramoto in Veniexia e quasi per tuto el mondo e
caçe molte cime de campanili e case e camini e la glesia de Sen Baseio, e fo sì gran
spavento che quaxi tuta la çente pensava de morir, e non stete, la tera de tremar cerca
dì XL; e può driedo questo començà una gran mortalitade e morì a la çente de diverse
malatie e rasion; alcuni spudava sangue per la boca e alcuni vegniva glanduxe soto li
scati e a le lençene, e alcuni vegniva lo mal de carbon per le carne, e pareva che questi
mali se pi'ase l'un da l'altro, çoè li sani da l'infermi. Et era la çente in tanto spavento,
che 'l pare no' voleva andar dal fio, né 'l fio dal pare; e durà questa mortalitade cerca
mexi VI, e si se diseva comunamente che li era morto ben le do parte de la çente de
Veniexia.*

■ 3 - Costozza (Vicenza), bell-tower at the church of S.Mauro. This inscription records the date of 1348 earthquake, as well of the earthquakes of 1117 and 1222. It is reasonable to suppose that the reference is to damage to the bell-tower itself, for it can be seen to have gone through various stages of construction (see fig. 18, p.106): "[...] 1348 Earthquakes".

[...] MCCCXLVIII Teremoti.

■ 4 - Aquileia, choir of the Basilica, inscription on the tomb of the patriarch Marquardo recording the rebuilding of the church.

"1381, 3 January, the patriarch Marquardo, an outstanding man, renowned throughout the world for justice, reputation, virtue and excellence of conduct, born of Randeck blood, lies in this splendid marble as used in the roof of the Aquileian building, towards whose construction he contributed beautiful Suabian things [Marquardo was Suabian]; he was count and vicar of Charles IV the former prince, and he was consul and justest of guardians of the empire, and the first thing this man did was to raise the needy church from its ruins, a work of the greatest piety; you, then, who read of the destiny of so great a man, weep with me and remember his great example".

M^oCCC^oLXXXI die III / ianuarii / notus ad extremos mundi vir maximus axes iustitia, fama, virtutum, culmi/ne morum, Marquardus Patriar/cha natus de sanguine Randeck hoc Aquileiensis inest generoso marmore tect/us, ortus cui iunxit dilecta su/evia primos, qui Caroli quarti comes atque vicarius olim principis / et consul fuit ac iustiss/imus omnis imperii tutor, vir primitus iste ruinis fundatam gravibus praesentem struxit egenam ecclesiam, sacratus opum moderamine nulla, haec igitur tanti d/omini qui fata legetis / mecum flete simul memoranda exempla tenete.

ITALY Earthquake's effects by locality based on historical sources

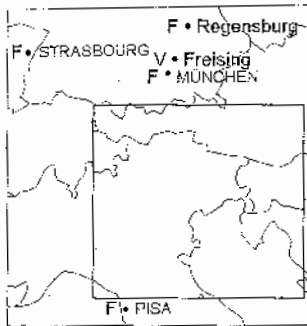
(in alphabetical order)

The table below provides a summary of effects, as recorded in primary sources, and confined to Italian localities (in alphabetical order) within the geographical limits of this catalogue.

Our survey shows that the area of major effects is in Austria: for an overall assessment, see the section entitled 'General effects of the earthquake' and the Austrian and German localities in the list on pp.433-4, as well as the comprehensive map of effects.

locality	effects	sources
Aquileia	Almost total collapse of the ancient basilica of Ss.Ermagora e Fortunato (which dated to a Romanesque reconstruction carried out in the first half of the 11th century). The bell-tower, whose small dome at the very top collapsed, was probably damaged almost in its entirety, for there is evidence of restoration work from the first string course upwards. There was other serious but unspecified damage.	Resolution, 1351; Innocent VI, Letter, 14 marzo 1354; Patriarch of Aquileia, Letter, 1362; Villani G., <i>Nuova Cron.</i> , pp.562-6; Aquileia, inscription on the tomb of the patriarch Marquardo
Bologna	The earthquake was so "great and fierce" that everybody was frightened.	Villola, <i>Cron.</i> , II, pp.583-4
Bolzano	Ten houses collapsed. In the Wagnergasse tower, longitudinal damage split it into two. In an otherwise unidentified church, a piece of stone became detached from the roof and the upper part of the bell-tower was damaged. The tower belonging to a certain "dominus Conrad" was damaged.	<i>Bozner Chronik</i> , pp.117-118

Costozza	An inscription reports the dates of three earthquakes, including that of 1348. It seems likely that this refers to damage suffered by the bell-tower itself.	Costozza, inscription on the bell-tower of the church of S.Mauro
Ferrara	The earthquake was "very great"; no damage is mentioned.	<i>Chron. Est.</i> , p.68; Nic. Ferr., <i>Polys.</i> , col.806
Gemona del Friuli	More than half its houses collapsed. The cathedral bell-tower was badly damaged and in danger of collapse; the stone statue of St.Christopher on the façade cracked from top to bottom.	Villani G., <i>N. Cron.</i> , pp.562-6
Mantua	The earthquake was felt; no damage is mentioned.	Alipr. Bonam., <i>Alipr.</i> , p.132
Mestre	Damaged probably occurred. A document of 8 May 1348 records repairs to a loophole.	ASVe, <i>Senato</i> , Misti, reg.24, fol.74r.
Modena	The earthquake was very strong here. No damage is mentioned.	ASMo, <i>Ms. Bibl.</i> , 162, <i>Legg.</i> , fol.42v.; <i>Ann. Vet. Mut.</i> , col.82
Mozzanica	The earthquake was strongly felt. No damage is mentioned.	ASMi, <i>Diplomatico</i> , Statuti, cartella II, fol.16v.
Noale	Damage probably occurred: a document of 8 May 1348 records the need for defensive works to be repaired.	ASVe, <i>Senato</i> , Misti, reg.24, fol.74r.
Padua	Some old houses with poor foundations collapsed; some chimneys fell down. In the cathedral, a large marble slab from the roof became detached and damaged the roof of the sacristy. The lower part of the tower of the <i>palazzo consiliare</i> , known as the Torre Rossa, was badly damaged and leaned at an angle; on technical advice it was subsequently demolished and rebuilt.	Zuvaro, <i>Note</i> , pp.109-111; <i>Liber regim. Padue</i> , pp.88,164; Cortusi, <i>Hist.</i> , cols.926-7
Paluzza	The inhabited area almost completely collapsed, and there were many victims.	Villani G., <i>N. Cron.</i> , pp.562-6
Monte Croce	Most of its houses collapsed.	Villani G., <i>N. Cron.</i> , pp.562-6
Piacenza	The earthquake was felt; no damage is mentioned.	Mussi, <i>Chron.</i> , col.499
Pisa	The earthquake was felt.	Villani G., <i>N. Cron.</i> , pp.562-6
Pordenone	Four large capitals fell from a bell-tower, probably that of the cathedral.	Giov. Pord., <i>Suppl.</i> , pp.56-7
Ragogna	Two of the castle towers collapsed into the river Tagliamento. There were many victims.	Villani G., <i>N. Cron.</i> , pp.562-6
Sacile	The north-east town gate collapsed.	Villani G., <i>N. Cron.</i> , pp.562-6
S.Daniele Fr.	Widespread collapses and many victims.	Villani G., <i>N. Cron.</i> , pp.562-6
Tolmezzo	Widespread collapses and many victims.	Villani G., <i>N. Cron.</i> , pp.562-6
Trento	Many houses and chimneys collapsed; the bell-tower of the church of S.Maria swayed and caused the bells to ring; water overflowed from the baptismal fonts.	Giov. Parma, <i>Cron.</i> , p.50
Troviso	Damage probably occurred. Repairs to some mills.	ASVe, <i>Senato</i> , Misti, reg.24, fol.71r.
Udine	A number of houses collapsed. Part, or half, of the patriarch's palace collapsed.	Villani G., <i>N. Cron.</i> , pp.562-6; Giov. Parma, <i>Cron.</i> , p.50



1348
January 25

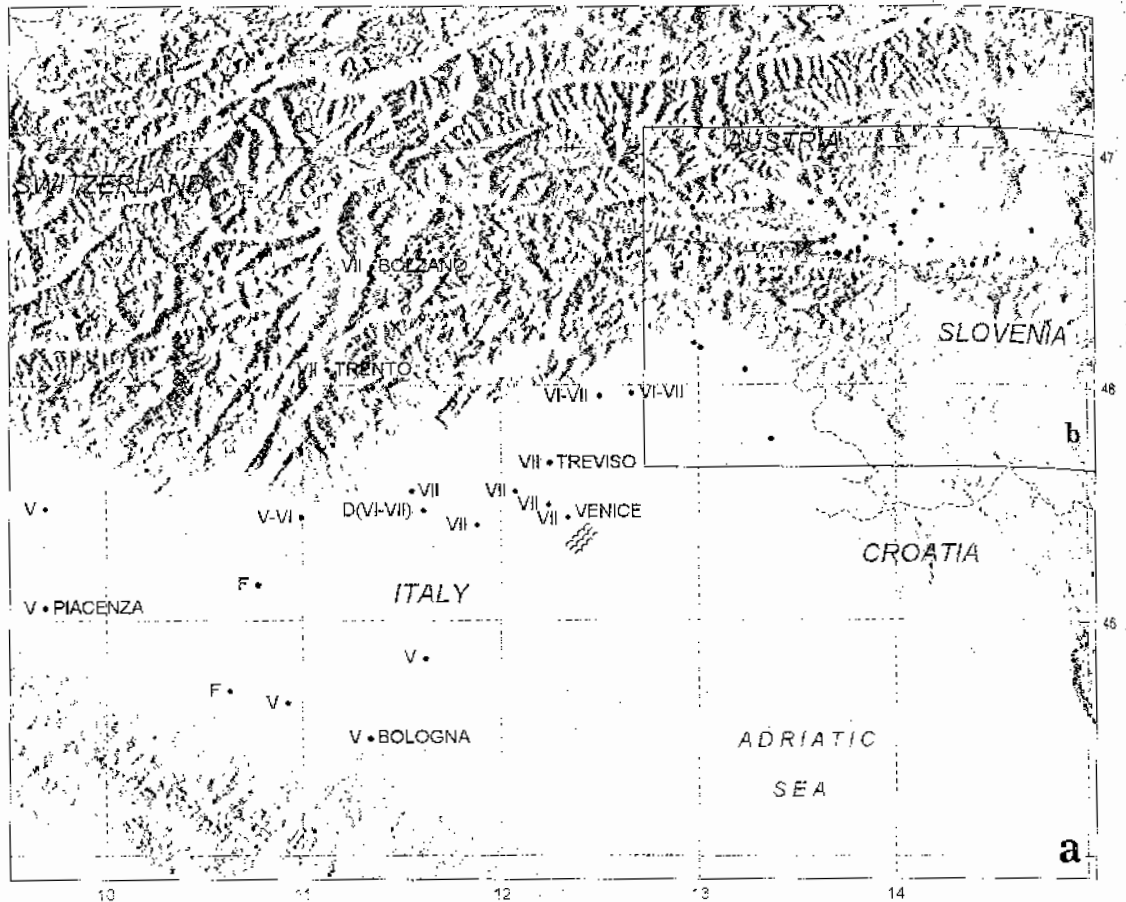


fig. 83a



- Venice Houses, the tops of some bell-towers, and chimneys collapsed. The dome of the basilica of S.Marco was damaged; the adjacent bell-tower swayed so much that the bells rang of their own accord. The left-hand side and the top of the church of S.Basilio collapsed. There were collapses and damage at the church of S.Maria dei Frari, described as the "new church of the Franciscans" (construction had in fact begun in 1340) as well as at the church of S.Vidal and S.Silvestro, the tops of whose respective bell-towers collapsed. There were collapses and damage to the bell-tower of S.Giovanni di Rialto (now S.Giovanni Elemosinario). Collapse of the bell-tower at the church of S.Angelo Raffaele as well as of the top of the church; collapse of the top of the bell-tower of S.Giacomo dell'Orio. At the Carmine church (S.Maria del Carmelo), collapse of the oculus above the church door; a segment still survives in the facade. Two arches collapsed at the Arsenal, and a wall was damaged.
- Venezona Many houses collapsed; damage to the cathedral, whose bell-tower was badly affected.
- Verona The earthquake was strongly felt; objects fell from shelves; people fled into the open. No damage is mentioned.
- Vicenza The earthquake was strongly felt; no damage is mentioned.

Venice, lunette of an internal portal in the former Scuola della Carità; De Grazia, *Chron.*, p.69; Zuvaro, *Note*, pp.109-11; BN Marciana Ve, Mss. It. Classe VII, 1275, Zancaruol, *Cron.*; Villani G., *N. Cron.*, pp.562-6

Villani G., *N. Cron.*; pp.562-6

Petrarca F., *Letter*, 1368; *Letter*, 1350; *Notae Ver.*, p.475
Conf. Costozza, *Framm.*, p.11

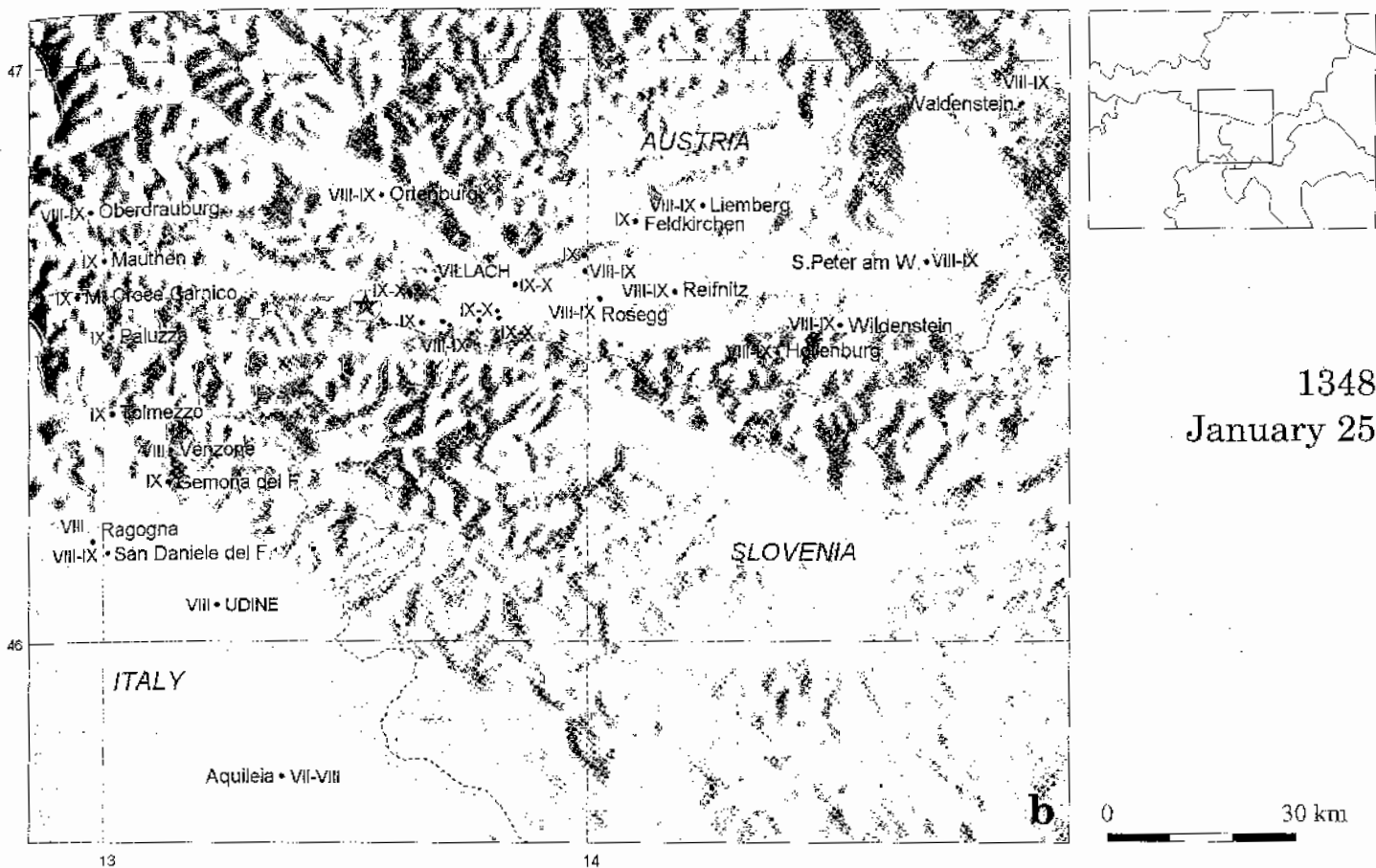


fig. 83b The identification of the epicentre is at present considerably hampered by the lack of data for the Slovenia area.

▲ 1348 01 25 15:00-16:00 UT ★ = 46 35 13 32 I₀ = IX-X Me = 7.3 Sites: 56 EE: 6 Ts?

location	lat.	long.	I	location	lat.	long.	I
Federaun A	46 34	13 49	IX-X EE	Oberdrauburg A	46 45	12 58	VIII-IX
Rain A	46 33	13 49	IX-X EE	Ortenburg A	46 46	13 34	VIII-IX
Villach A	46 37	13 51	IX-X EE	Reifnitz A	46 36	14 11	VIII-IX
Wasserleonburg A	46 36	13 38	IX-X EE	Rosegg A	46 36	14 01	VIII-IX
Arnoldstein A	46 33	13 43	IX EE	San Daniele del Fr. I	46 09	13 01	VIII-IX
Feldkirchen A	46 44	14 06	IX	S.Peter am Wallersb. A	46 39	14 42	VIII-IX
Gemona del Friuli I	46 17	13 08	IX	Waldenstein A	46 56	14 54	VIII-IX
Mauthen A	46 40	13 00	IX	Wildenstein A	46 38	14 31	VIII-IX
Ossiach A	46 40	13 60	IX	Ragogna I	46 11	12 59	VIII
Paluzza I	46 32	13 01	IX	Udine I	46 04	13 14	VIII
Monte Croce Carnico I	46 36	12 57	IX	Venezzone I	46 20	13 08	VIII
Strassfried A	46 33	13 39	IX	Aquileia I	45 46	13 22	VII-VIII
Tolmezzo I	46 24	13 01	IX	Bolzano I	46 30	11 21	VII
Bad Bleiberg A	46 38	13 41	VIII-IX	Mestre I	45 30	12 14	VII
Gallitz A	46 33	13 42	VIII-IX	Noale I	45 33	12 04	VII
Hochwart A	46 38	13 60	VIII-IX	Padua I	45 24	11 53	VII
Hollenburg A	46 30	14 24	VIII-IX	Trento I	46 04	11 07	VII
Krainberg A	46 32	13 46	VIII-IX	Treviso I	45 40	12 15	VII
Lienberg A	46 45	14 14	VIII-IX	Venice I	45 26	12 20	VII Ts?
Neuhaus an der Gail A	46 33	13 47	VIII-IX	Vicenza I	45 38	11 33	VII

location	lat.	long.	I	location	lat.	long.	I
Pordenone I	45 58	12 40	VI-VII	Piacenza I	45 03	09 42	V
Sacile I	45 57	12 30	VI-VII	Verona I	45 26	11 00	V
Costozza I	45 28	11 36	D (VI-VII)	Mantua I	45 09	10 47	F
Bologna I	44 30	11 20	V	Munich D	48 08	11 34	F
Ferrara I	44 50	11 37	V	Pisa I	43 43	10 24	F
Freising D	48 24	11 45	V EE	Regensburg D	49 01	12 07	F
Modena I	44 39	10 56	V	Reggio nell'Emilia I	44 42	10 38	F
Mozzanica I	45 29	09 42	V	Strasbourg F	48 34	07 45	F

< 191 > **1348 September shortly before 13 Subiaco [central Italy]**

source BMN Subiaco, arca XXIII, parchment 7, drawn up by the notary Paolo di Cervara
 historiography Mirzio (ed. 1885); Egidi (1904); Cignitti and Caronti (1956)
 literature Guidoboni *et al.* [1985]; Guidoboni and Mariotti (1997); Molin *et al.* (2000);
 Mariotti *et al.* (2000); Molin *et al.* (2002)

This earthquake is unknown to the seismic catalogue tradition, but not to scientific literature. In 1985 a parchment was brought to light which Guidoboni *et al.* [1985] think bears witness to this event, but there are legitimate doubts, which we attempt to clear up here.

Shortly before 13 September 1348 (that is to say, about a year before the great earthquake of September 1349 – see below), an earthquake caused damage to the *Rocca Abbaziale* at Subiaco (in the province of Rome). This building, also known as the “palace of the abbots” (*palazzo degli abati*), was occupied by the abbots of the local Benedictine monastery, one of the oldest in Italy. The only known report of the earthquake is a notarial deed concerning a donation made by a certain Giacomo di Santo Vito to his nephew Giovanni. The document was drawn up on 13 September 1348 by Paolo di Cervara, a notary. What is of interest to us is the date of the document itself, for it is declared that the deed was drawn up in the garden of the convent of S.Francesco, because Abbot Pietro had taken refuge there, as the *Rocca Abbaziale* had been damaged. That means that the earthquake mentioned in the deed had almost certainly taken place shortly before. The reference to the earthquake in the deed is as follows:

“In the name of Our Lord, amen. In the year of Our Lord 1348, in the seventh year of the pontificate of Clement VI, in the first indiction, on the thirteenth day of the month of September. [...].

Drawn up in the garden of S.Francesco of Subiaco of the order of Friars Minor, where the said abbot had taken up personal residence because of the very great earthquake which seriously damaged the castle of Subiaco”.

In nomine Domini, amen. Anno Domini millesimo .CCC^o xxxvij^o, pontificatus Domini Clementis pape .VI., anno eius .VII., indictione prima, mense septembris, die .XIII.^o. [...]

Actum in orto Sancti Francisci de Subiaco de ordine minorum ubi prefatus dominus abbas personaliter resiedebat propter terremotus maximum, ex quo dirupta erat rocca Subiaci.

The abbots' residence at the Benedictine monastery complex was separate from the monastic buildings themselves. The latter consisted of the monastery of S.Scolastica (founded in the 6th century) and the monastery of the Sacro Speco or of S.Benedetto (founded around the 11th century). The convent of S.Francesco was also just outside the inhabited area of Subiaco (see fig. 84). About a year later, this area, like much of

central Italy, was struck by the great earthquake of September 1349, for which there are a great many reliable sources. There are legitimate reasons for casting doubt on the accuracy of the above deed, as do Molin *et al.* (2000; 2002).

It was first made known in 1985 in studies carried out on behalf of ENEL (Guidoboni *et al.* 1985), and subsequently reconsidered both in Guidoboni and Mariotti (1997) and in Mariotti *et al.* (2000).

It has to be pointed out, however, that from the point of view of the diplomatics the dating given in the deed is unquestionable, since all its elements fit together perfectly: 13 September 1348 was indeed in the seventh year of the pontificate of Clement VI (May 1348 – May 1349), and in the first indiction (25 December 1347 – 24 December 1348).

The indiction calculation used in this document is based on what is known as the “Roman” or “pontifical” system, according to which the indiction begins on 25 December (or 1 January). A careful examination of the parchments dating to those years in the Subiaco archives shows that the “Roman” indiction system was used by all the notaries working in that area.

The only chronological element which appears to clash with the above is the reference to Abbot Pietro. He was in fact not officially appointed head of the Subiaco abbey by Clement VI until 30 March 1349 (Archivio Segreto Vaticano, *Registra Vaticana*, 187, fol.125r.). But there is an explanation for this apparent clash in the fact that when his predecessor Giovanni died of the plague in 1348, Pietro was immediately designated abbot by the monks of Santa Scolastica, between 31 May and 13 September 1348: it was only later (March 1349) that this was confirmed by the pope. This explanation is confirmed by a study of Benedictine customs in the 13th and 14th centuries as regards the appointment of abbots at Subiaco (Cignitti and Caronti 1956), as well as of clashes with the papal see and the fact that there are other notarial deeds which mention abbot Pietro before 1349.

We therefore think that there are no intrinsic or extrinsic factors to justify doubts

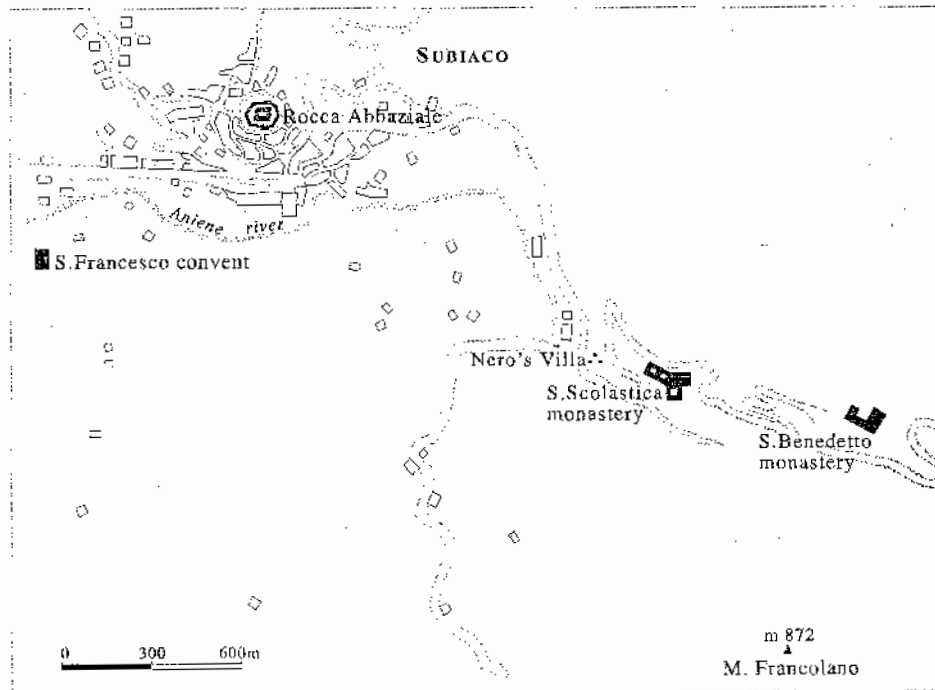


fig. 84 Subiaco: location of the *Rocca Abbaziale* damaged in the 1348 earthquake, and of the ecclesiastical buildings in existence in the mid-14th century.

about the dating of the document. But we also have to ask ourselves whether an authentic notarial deed may contain — for reasons unknown to us — a falsehood: could the date, for example, have been tampered with, and the deed backdated by one year? Or could the document be referring to the earthquake of 1349? We do not think such a view is tenable, for if the notary wrote the document in 1349 and wished to backdate it, why on earth did he include such specific references to the great earthquake? For the seismic crisis of 1349 was very famous, and so no-one at that time and in that region could have had any doubt about dating it to that year.

These two considerations lead us to set aside the hypothesis put forward by Molin *et al.* (2000), according to whom the date of the notarial deed in question is simply “wrong”, and hence the reference to an earthquake in that year is to be rejected. But by its very nature, a notarial deed cannot be rejected as “false” or “wrong” without proof. The only possibility which we can entertain as to this aspect of the deed is that, for unknown reasons, the notary allowed a year to pass by between a first draft of the deed (with the date of the earthquake) and its final form (with the date of the document itself). But there is no element of textual criticism which would allow us to opt for that hypothesis.

Molin *et al.* (2000) prefer to accept what the *Chronicon Sublacense* has to say, having compared the two texts and decided that only one of them can be right. The *Chronicon* is the only text close to the time of the 1349 earthquake which mentions effects at Subiaco: it was written between 1370 and 1377, i.e. about thirty years later. However, the chronological inaccuracies of this chronicle are well known to historical criticism: the anonymous chronicler backdates the famous plague epidemic of 1348 by a year, in spite of the fact that there are a great many wills drawn up in 1348 which bear witness to the plague at Subiaco. He also places the death of Abbot Giovanni in 1347, though he was in fact still alive in May 1348; and he goes on to state that Abbot Pietro died in 1349 (shortly after the great earthquake) when in fact he was still active in September 1350 (BMN Subiaco, arca VIII, pergamena 81; Egidi 1904, p.215). Set out below is the text of the *Chronicon*:

“In the year of Our Lord 1349, the abbot after Giovanni was Pietro of Perugia, in whose time an earthquake almost completely destroyed the monastery and *Rocca* of Subiaco and other fortified abbey buildings. The abbot himself was in his room in the castle when the destruction occurred, and he was so frightened that he lived for only a short while after [the earthquake]”.

Anno domini MCCCXLIX post Iohannem fuit Petrus abbas nacione perusinus cuius tempore terremotus monasterium et roccam Sublaci et nonnullas alias roccas abacie ad solum pene prostravit in qua ruina cum esset idem abbas in camera sua apud roccam sublacensem territus parvo tempore supervixit.

In our view, it is reasonable to suggest that when the anonymous compiler of the *Chronicon* was writing almost thirty years after the great earthquake of 1349, he absorbed into it the 1348 earthquake at Subiaco, the one having become superimposed on the other, perhaps, in his memory. One building which both sources mention is the *Rocca Abbaziale*. According to the notarial deed it was badly damaged in 1348; whereas the *Chronicon Sublacense* states that it completely collapsed in 1349.

Even if, as we think, these were two different earthquakes, the two reports about the castle do not appear to be completely contradictory, and they even allow for an on-going deterioration in the *Rocca*'s condition (always assuming that the building had not yet been completely restored).

▲ 1348 09 shortly before 13

location	lat.	long.	I
Subiaco	41 55	13 06	VIII

- < 192 > 1349 January 22 Isernia Central Italy
- < 193 > 1349 September 9 Northern Latium ▷ clouding of springs <
- < 194 > 1349 September 9 L'Aquila and Cicolano areas
- < 195 > 1349 September 9 Sulmona area ▷ landslide <
- < 196 > 1349 September 9 Southern Latium-Northern Molise
▷ landslides, fissures, appearance and disappearance of springs <

sources I Documents

[manuscript] ASVat, *Registra Avenionensia*, vol.159, Urban V (pope), Letter, 20 March 1365; *Registra Vaticana*, vol.143, Clement VI (pope), Order, 13 November 1349; Order, 20 Februar 1350; two Orders, 12 May 1350; vol.198, Clement VI (pope), Letter, 1 April 1350; vol.145 Clement VI (pope), Grant, 1 July 1351; Letter, 7 July 1351; vol.222, Innocent VI (pope), two Letters, 21 April 1353; vol.125, Innocent VI (pope), Letter, 2 June 1353; vol.236, Innocent VI (pope), Letter, 5 May 1354; vol.226, Innocent VI (pope), two Letters, 26 August 1354; vol.287, Gregory XI (pope), Letter, 19 Februar 1376; ASTr, Sez. Orvieto, *Riformagioni*, vol.136, five *Riformagioni*: 12 September 1349, 6 October 1349, 20 October 1349, 3 Novembre 1349, 25 November 1349; *Riformagioni*, vol.137, one *Riformagione*, 5 September 1350; ASAg, Sez. Sulmona, *Opera pia Casa Santa dell'Annunziata*, no.242, cass.II, doc.324, 28 January 1362; doc.329, 3 July 1362; doc.336, 19 May 1362; doc.340, 18 September 1363; doc.420, 30 January 1368; doc.452, 23 January 1370; doc.467, 5 August 1370; doc.535, 2 July 1375; doc.551, 2 March 1376; doc.593, 7 July 1378; ACapVeroli, *Veroli*, Parch. 307, Deed of sale, 8 June 1356; Parch. 351, Deed of sale, 15 October 1365; Parch. 380, Deed of sale, 13 December 1364; ADiocVt, *Sant'Angelo de Spata*, cart.1, fasc.34, Nota, September-October 1349; BAVat, *Sant'Erasmo di Veroli*, cart.21, Parchment 7, Deed of sale, 8 October 1352; cart.33, Pergamena 3, Authority of a Legate, 24 September 1360; BBAngelico, Rome, Pergamene di Santa Maria a Gradi, Will, 15 July 1350; BNNaples, *Mss.*, X.C.77, Valla, *Storia*, fol.80, Atto, 1423 Charles III of Durazzo, Diploma, 31 December 1382, in *Cod. Dipl. Sulmon.* (ed. Faraglia 1888, p.208); Louis (king) and Joanna I of Anjou (queen), Privilege, 28 June 1352, in Bonito (1691, pp.570-1); Louis (king) and Joanna I of Anjou (queen), Privilege, 4 March 1354, in *Cod. Dipl. Sulmon.* (ed. Faraglia 1888, pp.212-3); Deed of sale of a piece of land belonging to the Collemaggio monastery, 1 June 1374, in Pansa (1900, p.260); Tax payment account, in Inguarez *et al.* (1942, pp.54-5); Urban V (pope), Letter, 28 May 1363, in Leccisotti (1952, pp.54-5); Urban V (pope), Letter, 23 September 1365, in Leccisotti (1952, p.67); Urban V (pope), Letter, 10 maggio 1370, in Gattula (1733, II, pp.520-2); Pietro Amcil (archbishop of Naples), Petition, 5 June [1365], in Leccisotti (1952, pp.59-60); Raimondo (bishop of Palestrina), Order, 1 October 1371, in Gattula (1733, II, p.522); Letter from the bishop of Alatri, 3 April 1350, in Floridi (1967, pp.161-2)

Annals, chronicles, *Notulae*, letters

Villani M., *Cron.*, I, pp.86-7; Petrarca F., Letter to Luigi Santo, 11 June 1351 (ed. Rossi 1933, vol.11, pp.337-40); Letter to Angelo di Pietro Stefano dei Tosetti, 1353, (ed. Rossi 1933, vol.12, pp.157-63); Letter to Guido Sette, Venice 1368 (ed. Bigi 1963, pp.962-3); Buccio Ran., *Cron.*, pp.188-190; Quatrario, *Carmina*, pp.305-6; *Chron. brev. Atin. eccl.*, col.910; *Disc. hist.*, p.29; *Notulae* in Cassino codex 47 (in Caravita 1870, vol.2, pp.121, 123-4); *Append. alla chron.*, p.75; *Secun. vita Clem. VI*, col.567; *Chron. Sublac.*, p.44; Giov. Bazz., *Chron.*, p.247; *Ann. Reat.*, p.267; Heinr. Taube, *Chron.*, p.99; Villola, II, p.597; BNCFlorence, *Mss. Capponi*, 127, 6, Nicola della Tuccia, *Cont.*, fols.95r.-96v.; *Record of the earthquake of 9 September 1349*, in Viti (1972, p.384)

- inscriptions 1. on the door of Alvito castle, in Tauleri (1702, p.116); 2. in the cathedral of Ariano Irpino, in Pantosti and Valensise (1989, p.547)
- sources 2 BRiccMor, Florence, *Mss. Moreniani*, 277, *Priorista*, fol.83v.; *Mss. Riccardiani*, 1941, *Cron.*, fol.128r.; *Mss. Capponi*, 127, 2, *Suppl.*, fol.105; *Manoscritti*, III.241, S.Ammirato, *Istorie*, fols.106v.-107r.; BAVat, *Vat. Lat.*, 7934, *Chron. ascul.*, fols.4r., 7v.; BProvTommasi, LAquila, ms.325, Cirillo, *Appunti...*; Archivio Parr. S.Maria di Civita di Arpino, Ms. 1, fol.37v, *Notula*; BGiovVeroli, ms.42.4 1, Vecchi, *Hist.*, IV, fol.114; Franc. di Andrea, *Le cron.*, p.333; *Tertia vita Clem. VI*, p.586; *Sexta vita Clem. VI*, col.588; *Secun. vita Innoc. VI*, col.634; *Cronachetta anon.*, p.4; *Cron. Aquil.*, pp.24-5; Mar. Moro, *Memor.*, p.101; *Cron. Ramp.*, II, p.596; *Cron. città Perugia*, p.151; *Cron. ascul.*, pp.4, 8; Bernard. Fossa, *Cron.*, p.55; *Prima vita Urbani V*, cols.624, 625-6; *Vita Urbani IV*, col.644; Manente Cipr., *Hist.*, vol.1, pp.248-9; Pellini, *Dell'Hist.*, pp.891-2
- historiography Cirillo (1570); Collenuccio *et al.* (1591); Ciarlanti (1644); Goutoulas (1665); Febonio Muzio (1678); Ughelli (1717); Muratori (1762-64); Antinori (ed. 1971); Moroni (1840-79); Vittori (1896); Egidi (1904); Pierleoni (1911); Perrella (1913); D'Angelo (1915); Lanciani (1918); Gregorovius (1943); Spagnesi and Properzi (1972); Pantoni (1973); Mattiocco (1978); Grohmann (1981); Orsini (1982); D'Achille *et al.* (1984); Carocci (1988); Nicosia (1999)
- literature Spadea *et al.* (1985); Guidoboni *et al.* [1986]; Molin and Guidoboni (1989); Guidoboni and Molin (1995); Esposito *et al.* (1996); Molin *et al.* (1999)
- catalogues d. Pacca [1563-1580]; Ligorio [1570]; Filippo da Secinara (1652); Bonito (1691); Abbati (1703); Perrey (1848); Mallet (1853); Capocci (1861-63); Mercalli (1883); Baratta (1893); Taramelli (1896); Baratta (1898); Baratta (1901); Milne (1911); Costantini (1915); Gavini (1915); Passaro (1980); Conversini *et al.* (1990); Boschi *et al.* (1995, 1997, 2000)
- catalogues p. Giorgetti and Iaccarino (1971); Carrozzo *et al.* (1973); Postpischl (1985); CPTI (1999)

History of the earthquake's interpretation

The study of this great seismic event has its own history, which merits a brief survey. The earthquake was recorded in a vast number of medieval sources and documents, entered the erudite historiography of modern times, then took its place in the earliest historical earthquake catalogues (from Pirro Ligorio 1570-71 to Bonito 1691 and on to Baratta 1901), and passed from there into the first parametric catalogues. Baratta (1901) identified its location as being in the Abruzzo and Sannio regions, and traced its effects as far as Apulia.

When Italians first looked at it again in the 1970s, an urgent need was felt to provide it with numerical parameters, so that it would fit into the first parametric catalogues of historical earthquakes, its location then being given as the Abruzzo - Sannio region (Giorgetti and Iaccarino 1971), and specifically Sant'Elia Fiumerapido.

As one of central Italy's largest earthquakes, it underwent radical reinvestigation in 1983-85, in connection with macroseismic studies for the nuclear sites in Italy. On that occasion, massive and systematic research was carried out into documentary, annalistic and epigraphic sources, in order to establish an accurate picture of the event. It is thus only since new research was carried out in the 1980s that we have had a reliable macroseismic picture of effects, and also a more accurate analysis of the problems and limitations of information dating back to the time of the event (Guidoboni *et al.* 1986, Report for ENEL).

One problem involved in studying the earthquake is the difficulty of distinguishing between the effects of four earthquakes, and establishing their location. After the research of the 1980s, the earthquake again became the subject of attention in the period 1992-94. During this fresh phase of research, new documentary evidence was uncovered, but establishing the location of the four earthquakes remains an almost

insurmountable problem, especially since it is not clearly indicated in the sources. The *Catalogo dei forti terremoti* (Boschi *et al.* 1997, 2000) has nevertheless attempted to establish an overall picture of effects based on the geographical "congruence" of damage. At this stage in particular, specific research into the Perugia area was carried out, the only sources previously available being non-local and unofficial. As far as the location of effects and local intensities are concerned, the scenario we offer here is based on the sources which are closest in time to the event.

Problems of chronology

Most chronicles date the earthquake to 9 September, but Matteo Villani and Giovanni da Bazzano give 10 and 1 September respectively. There is telling evidence of uncertainty about the exact date even amongst contemporaries in a document compiled in September – October 1349 (Archivio Diocesano, Viterbo, S. Angelo de Spata, cart. 1, fasc. 34, fol. 3r.), where the *canonico camerario* of Viterbo left a blank instead of writing in the day in September when the earthquake occurred.

Few sources give a time for the earthquake. Amongst those dating it to 9 September, the two most detailed agree on 8:15 UT (before or half way through the third hour). Another source provides a more descriptive suggestion: shortly before sunrise (which, at that time of year and at the latitude of Montecassino, would be 4:45-5:00 UT). Giovanni da Bazzano, who dates the earthquake to 1 September, nevertheless suggests a similar if not identical time to that of the above two sources: roughly between 7:00 and 8:00 UT (near the second hour and before the third). This similarity of time suggests that Giovanni da Bazzano may have mistaken the date.

There had been a strong earthquake at Isernia during the night of 22 January 1349, though no damage is reported; and from that night onwards, there was a more or less uninterrupted series of weak shocks almost every month until 8 September.

General effects of the earthquakes: the four areas of damage on September

The 1349 earthquake struck a vast area of central Italy, and proved to be one of Italy's most extensive and destructive seismic events. The destructive shocks were preceded by an earthquake at Isernia during the night of 22 January 1349. It did not cause any damage. The strongest shocks occurred during the first ten days of September 1349; but uncertainties remain as to the exact chronology of the seismic sequence (see below). Overall, we have information about damage at 47 localities, and in 25 of these the damage was severe. On the basis of the distribution of effects, four separate epicentral areas have been suggested, but their outlines are blurred and partially overlap.

1. the first includes the Viterbo area and Umbria. The worst affected towns were Viterbo, where there were some collapses and serious damage to the churches of S. Angelo in Spata and S. Stefano as well as to the Gatteschi and Marcuccio towers, and Toscanella (present-day Tuscania) in the province of Viterbo), where the castle was badly affected. There was also substantial damage to the castle at Onano (in the province of Frosinone). At Orvieto, the town hall was damaged, as well as various private buildings. There was probably damage at Terni, and perhaps at Perugia as well. The earthquake was felt as far away as Bologna and Modena.

NORTHERN LATIUM

2. the second area includes the city of L'Aquila and the Cicolano area (corresponding to the upper and central valley of the river Salto, in the area of the eastern Latium Apennines, in the present-day province of Rieti). The most destructive effects were widespread collapses and serious damage to buildings at ten localities in the Cicolano area, which were partly abandoned by their inhabitants after the earthquake, namely Colle Sambuco, Gamagna, Girgenti, Marcri, Petrella Salto, Poggio Poponesco, Radicaro, Santa Maria, Staffoli and Vallebona. In addition to widespread damage in the city of L'Aquila, the cathedral and the church of S. Maria di Collemaggio collapsed, as well as many bell-towers, towers and palaces. The sources also record very serious damage at Bazzano and

L'AQUILA AND CICOLANO AREAS

Santa Maria della Vittoria, both of which are now in the province of L'Aquila. The church, monastery of S.Scolastica and castle collapsed at Subiaco. There were also substantial effects in Rome: the basilica of S.Pietro was damaged, as well as the churches of Dodici Apostoli, S.Giovanni in Laterano, S.Maria in Aracoeli and S.Paolo fuori le Mura, and also the Milizie and Conti towers. Part of the castle collapsed at Tarano (in the present-day province of Rieti). There was probably damage at Ascoli Piceno.

SULMONA AREA

3. the third area includes four localities in ancient Abruzzo Citra (in the present-day province of L'Aquila). The most serious effects were probably at Pacile and Rocca Gilberti, for there are substantial grounds for thinking that they were abandoned after the earthquake. Serious damage at Sulmona included the collapse of the town walls and the convent of S.Domenico; and at Pacentro two churches were damaged.

SOUTHERN LATIUM
AND NORTHERN MOLISE

4. the fourth area includes the Sora and Cassino areas as well as that of Isernia. There is evidence of more or less serious damage at 20 localities: Atina (in the province of Frosinone) and Venafro (in the province of Isernia) were almost completely destroyed; in the town of Isernia many buildings collapsed or were seriously damaged, including the cathedral. There were also collapses and serious damage at Cerasuolo (in the province of Isernia), and at Cardito, Alvito and San Germano (present-day Cassino) and Sant'Elia Fiumerapido (in the province of Frosinone). There were substantial collapses in the abbey church at Montecassino, and the adjacent monastery was also damaged. The abbeys of S.Vincenzo al Volturno and S.Domenico were also destroyed. The earthquake also caused serious damage at Sora, Veroli, Balsorano Vecchio, Sant'Agnello, Aversa, San Vittore del Lazio and Le Fratte (present-day Ausonia), all of which are in the present-day province of Frosinone. There was also substantial damage at Ariano Irpino and Naples, where the façade and bell-tower of the cathedral collapsed.

Environmental effects

Many of the earthquake's environmental effects are recorded in general terms: fissures occurred at unspecified places; many springs, at unidentified places, dried up or suddenly appeared. However, the sources indicate the location of these effects only in a few cases. We set these out below, arranged according to the damage areas already established.

At Orvieto, which lies within epicentral area 1, a spring became cloudy for 12 days and then grew muddy.

Within epicentral area 3, a large landslide on the rock spurs of the La Maiella massif, between Pacentro and Campo di Giove, probably swept away the village of Rocca Gilberti. A landslide was also probably responsible for the collapse of the castle at Balsorano, in epicentral area 4.

Evidence of social and economic effects

This period of seismic activity involved extremely diverse human environments, from densely populated cities (such as Orvieto, Viterbo and Rome), to small isolated military settlements, such as the castles in the Abruzzo, and the great medieval monasteries of Montecassino, San Domenico, Sant'Agnello (in province of Frosinone) and San Vincenzo al Volturno (province of Caserta). Within the general picture of effects, therefore, we find substantial differences both as to the types of building affected (built-up areas in villages and towns, fortresses, isolated houses, towers, churches etc.), and different population densities. These substantial differences from one place to another make an assessment of effects very difficult, and it can often only be arrived at by indirect means. The earthquake occurred not long after the whole of Europe was struck by the famous Black Death of 1348 (see entry (190)). 1349 was also a black year for Europe because of the persecution of the Jews, whom Catholic fanatics held responsible for the spread of the plague epidemic. It was also the year in which Giovanni Boccaccio began writing the *Decameron*, a collection of 100 stories in a narrative setting which takes as its point of departure the tragic need to flee from the plague: a cheerful group of people take refuge

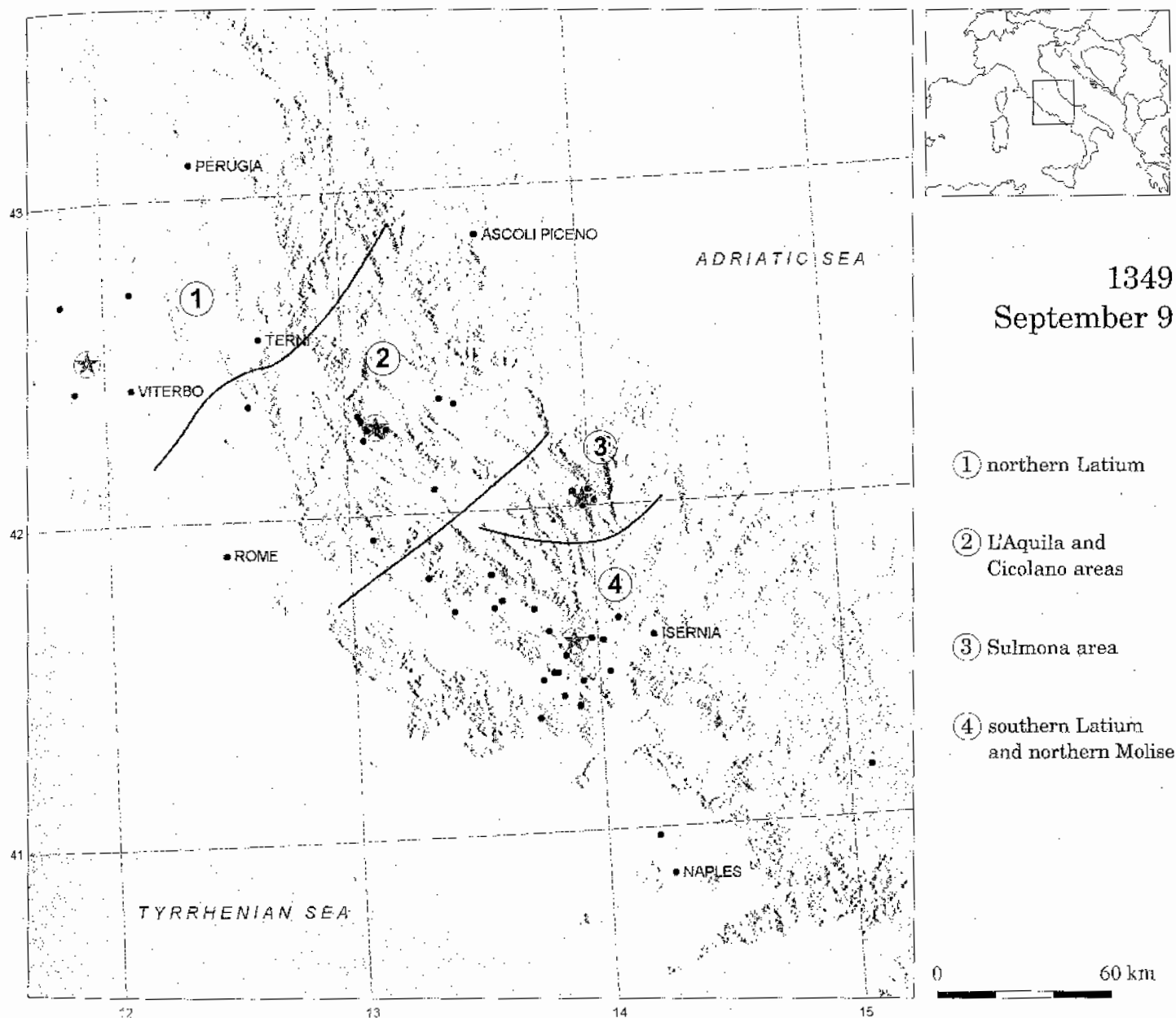


fig. 85 On the basis of the damage pattern four epicentres have been hypothesized. For further details, see the maps on pp.447, 451, 463, 467.

in the country and listen to carefree stories, thereby representing metaphorically the flight from and reaction to a particularly troubled and uncertain moment in history. In addition to the damage caused by the earthquake itself, there was that caused by contemporary warfare. At an early stage, a demographic and economic crisis caused appreciable impoverishment in some areas, as for instance in the diocese of Montecassino, which was still unable to pay its tithes in 1361. At L'Aquila and Orvieto, the earthquake brought production to a temporary halt; and at Orvieto the local authorities took it upon themselves to introduce emergency measures for repairing the most serious damage to public buildings. In the Abruzzo, where the administration was more strongly feudal, it was the local lords who organised reconstruction: the Cantelmo family for the fortresses of Alvito and Atina, and the counts Caponeschi for L'Aquila. The papal

chancery used a series of concessions of a religious nature (especially indulgences) to promote the collection of funds for the reconstruction of damaged buildings (this went on until 1376). Contemporary sources record a total of more than 2,500 victims, though the figures are not always reliable, since official documents of the time are not concerned with information of that kind. 800 victims are recorded for the city of L'Aquila; 700 for the Venafro area, and almost 1,000 for that of Montecassino. Deaths are also recorded for Atina and Balsorano, but without any number being specified. Isolated cases of depopulation and partial abandonment are also recorded for minor localities such as Venafro (province of Isernia) and all the localities struck in the Cicolano area. There is no record of towns being abandoned, though in the case of L'Aquila, count Caponeschi prevented the populace from leaving by having a new palisade immediately erected at those places where the city walls had collapsed. The peasants from around L'Aquila were also made to clear the city streets of obstructing rubble. In the late historiographical tradition, this earthquake is identified as the reason for the abandonment of numerous villages both in the Montecassino area (Giuntura, Mortula, Piumarola, San Pietro della Foresta and San Paolo della Foresta, Teramo), and that of Sulmona (Pacile and Rocca Gilberti).

Historical sources: an overall view

There is evidence for this earthquake in numerous contemporary sources: 60 documents, of which 39 are unpublished, and 20 other records, including chronicles, *Notulae*, letters, and lives of popes. The wealth of available contemporary sources is probably due to the earthquake's substantial destructive effects and the fact that they were widely spread across central Italy. These circumstances led to reports of the earthquake spreading widely and over a long period, as we can tell from the very large number of local and non-local chronicles which record it, as well as the historiographical works of later centuries. There are more than twenty 15th and 16th century records of the earthquake from the affected area, providing greater or lesser degrees of analysis. There are two inscriptions, one at Alvito and the other at Ariano Irpino, which record earthquake damage to two buildings.

ARCHIVAL DOCUMENTS

Very extensive archive research has been carried out, leading to the discovery of strikingly important documents, and providing evidence of measures taken at various administrative levels for repairing earthquake damage, granting indulgences and other benefits, or drawing up wills and notarial deeds.

The corpus of archive documents in which the earthquake is recorded consists of public, private and church collections. The documents concerned are:

- (i) 21 papal and episcopal letters, some of which are in the Archivio Segreto Vaticano, while others have been published;
- (ii) 6 *Riformagioni* (official local authority documents) from the commune of Orvieto;
- (iii) 3 documents from the chancery of the Kingdom of Sicily;
- (iv) 19 notarial deeds.

In particular, there are:

- (i) papal letters from Clement VI (1342-1352), Innocent VI (1352-1362), Urban V (1362-1370) and Gregory XI (1370-1378), mostly still unpublished and now in the Archivio Segreto Vaticano, as well as some episcopal letters which illustrate the various measures taken by the Church for the repair of earthquake damage to various properties owned by ecclesiastical and papal institutions. These documents provide evidence of direct financing in the case of churches in Rome and fortresses in the Papal States (at Tarano, Onano and Toscanella, now Tuscania); the granting of indulgences in exchange for offerings for the restoration of monastic and episcopal property, such as churches at Montecassino, Veroli, L'Aquila and Sulmona; requests for tax exemption made to pub-

lic authorities; public appeals for alms; the exceptional application of monastic income to ecclesiastical property of great importance (the abbey of Montecassino).

(ii) *Riformagioni* of the commune of Orvieto, which are public documents of administrative and institutional importance recording measures taken by the city council for damage repair.

(iii) archive documents belonging to the Kingdom of Sicily and relating to the regions of Campania and the Abruzzo, where most of the stricken towns were situated; but they have suffered substantial losses over the centuries. Hence complete files are missing, and the only available documents are records (registri of a sort) describing measures taken by the court at Naples on behalf of castellans in the Abruzzo, the people of Sulmona and religious bodies.

(iv) the following public deeds drawn up by private individuals (notarial deeds) and containing explicit references to the earthquake: a will from Viterbo; 4 deeds of sale made by monks from Veroli (in the province of Frosinone) in order to pay for restoration work; a sale document drawn up by the abbot of the monastery of Collemaggio at L'Aquila; a deed concerning the reconstruction of the church at Venafro; and a list of expenses for the repair of the church of S. Angelo in Spata at Viterbo.

CHRONICLES

There is a very rich and varied group of contemporary chronicles containing original and independent reports of the earthquake: chronicles, *Notulae*, letters, and lives of popes. The chief chronicle, in terms of the diffusion it enjoyed in subsequent centuries, is that of Matteo Villani, a contemporary Florentine. The earthquake is also referred to a number of times in the letters of the poet and humanist Francesco Petrarca, who provides evidence of its effects in Rome; and there are also numerous local chronicles which record the earthquake in relation to individual regions or localities.

INSCRIPTIONS

Two inscriptions recording this earthquake have been found.

■ 1 – on the castle door at Alvito. This inscription is contemporary, and records the reconstruction of the building by Rostaino Cantelmo (Tauleri 1702).

■ 2 – in the cathedral at Ariano Irpino. This inscription was made in the year 1736, and records a series of earthquakes which struck the cathedral between 848 and 1732, including that of 1349. Although this is a late inscription, we have taken it into account as an official collective commemoration of the history of a church building (Pantosti and Valensise 1989).

Historiography

Because the damage was so great and the badly affected area so large, the earthquake appears in numerous historiographical texts of various kinds, ranging from erudite 17th century works to late 20th century historiographical research.

These texts deal with various subjects in which the earthquake is more or less directly referred to. They may be histories of towns or specific areas, works of town planning or architecture perhaps including items devoted to individual buildings, or archaeological works. We know of more than 60 such works, but for present purposes we have selected those which are most significant and authoritative.

Earthquakes effects by localities, based only on primary sources

(for each damage zone, the localities are arranged in descending order of severity of effects)

Set out below is a description of earthquake effects at the localities in question, together with the reactions of the authorities, arranged in a double hierarchy: (i) according to the four epicentral areas referred to above, and (ii) in decreasing order of severity of effects within each of these areas, with sources referring to the damage concerned.

AREA ① **Viterbo**

There is a record of damage to the arches, gutters and principal wall at the church of S. Angelo in Spata. The houses and arcade opposite the façade of the church of S. Stefano (no longer in existence) collapsed, as did the Torre dei Gatteschi and the Torre di Marcuccio in the S. Chirico district. There were many victims. The church of S. Angelo in Spata was restored. In a will of 1350, the proceeds from the sale of a vineyard were left for repairing the bell-tower and roof of the church of S. Maria in Gradi. Documentary sources consist of a note of 1349 concerning the cost of restoring the church of S. Angelo in Spata, and a notarial deed of 1350. Narrative sources consist of the 15th century chronicles of Nicola della Tuccia and Francesco di Andrea.

A note written in September or October 1349 by the *canonico camerario* Gerardo, sets out the cost of repairing the church of S. Angelo in Spata (Archivio Diocesano, Viterbo, *S. Angelo de Spata*, cart. 1, fasc. 34, fol. 3r.). It is interesting to note that, although the document was written only a few weeks after the event, the date of the earthquake has been left blank. This is clear evidence of uncertainty about the exact chronology of the shocks even amongst contemporaries.

"In the name of God, amen. The following costs are those incurred in repairing the arches and gutter and putting right the great wall of the church [of S. Angelo in Spata] opposite the house of Arcius Tucci de Sanctolcleo, the damage having been caused by earthquakes which occurred in the year of Our Lord 1349, during the pontificate of Clement VI, in the second indiction, on the [blank space] of the month of September. These earthquakes also destroyed the towers opposite the door of the church of S. Stefano, and the Torre di Marcuccio belonging to signor Paolo [which stood] in the S. Quirico district by our mill. [There follows the list of costs]"

In nomine Domini amen. Infra scripte sunt expense facte in arcubus, in gronaria, pro adiutorio parietis magni ecclesie versus domum Arcii Tucii de Sanctolcleo propter terremotus qui fuerunt anno Domini .M.CCC.XLVIII., tempore domini Clementis pape .VI., indictione secunda, die [...] mensis septembris propter quos etiam in ruina fuerunt turres que erant in opposito hostii ecclesie Sancti Stephani verum et ipsa ecclesia et turris Marcucii domini Pauli que in contrata Sancti Quirici super molendinum nostrum.

A notarial deed of 15 July 1350, containing the will of an inhabitant of Viterbo, records the sale of some property, the proceeds of which were to go towards the repair of the bell-tower and roof of S. Maria in Gradi (Biblioteca del "Beato Angelico" at the Dominican convent of Santa Maria della Minerva, Rome, *Pergamene di Santa Maria in Gradi*):

"In the year 1350, during the pontificate of Clement VI, in the third indiction, on 15 of the month of July [...] [using the proceeds of the sale of a vineyard] a contribution to be made to the repair of the bell-tower of the church of S. Maria in Gradi in Viterbo [...] [a house in Viterbo and a meadow in the surrounding country] to be sold and the whole proceeds to be devoted to paying for repairs to the roof of the church of S. Maria in Gradi".

Anno millesimo trecentesimo quinquagesimo, tempore domini Clementis pape VI, indictione tertia, die XV mensis iulii [...]. fiat auxilium sive adiutorium ad campanile ecclesie Sancte Marie ad Gradus de Viterbio [...]. vendantur et pretium totum dictarum rerum integre distribuatur in opere tecti dicte ecclesie Sancte Marie ad Gradus.

Further details are provided by two 15th century chroniclers from Viterbo: Francesco di Andrea and Nicola della Tuccia (in his continuation to 1473 of the chronicle by Ansillotto Viterbese, in the Biblioteca Nazionale Centrale, Florence, *G. Capponi*, 127, 6, fols. 95r.-96v.). Both chroniclers provide very similar information, and both derive it from the 14th century chronicle of Girolamo and Cola di Covelluzzo, which is now lost. Nicola della Tuccia is the more detailed of the two:

In nomine domini Amen. Infra scripte sunt expense facte et percipiuntur
ad reparandum praedictam magis ecclesiam infra domum de qua supra dicto
tremotus qui fuerit anno domini .M. CCC. XLV. in die mensis
septembris .O. mensis septembris .O. quos et tributa fuerit
tunc quod erat a oppono hosti ecclesie de sancto stephani usque ad ipsam ecclesiam
et tunc ad domum domini panni que erat de qua supra dicto
anno . In pace.
In iustitia meo sonam in meo de domo statum a meo . p .m .
et iustitia meo a meo quatuordecim . p .m .

fig. 86 Viterbo, cost account for repair work to the church of S. Angelo in Spata, which was damaged in the earthquakes of September 1349. The account was compiled in September or October of that year by the *canonico camerario* of the diocese of Viterbo. The red circle shows the space left by the person who drew up the document at the point where the date of the earthquake should have been written. It is likely that the sequence of shocks made it difficult to determine the exact day (Archivio Diocesano, Viterbo, *S. Angelo de Spata*, cart. 1, fasc. 34, fol. 3r.).

"In the year of Our Lord 1349, there was a great earthquake at Viterbo. It caused a tower opposite S. Stefano to collapse on to some Gatteschi family houses and on to houses [opposite] the façade of S. Stefano, and it brought down the loggia in front of that church and killed a great many people who had come to see the body of Christ that Sunday morning. The only survivor was a man called Boccapane, who was buried in the ruins for three days and nights, and was fed through a narrow channel; and another tower collapsed in the S. Chirico district, destroying a number of houses, and the new shops were rebuilt later. And this tower was beside a small gate which led to the ditch of Sonza, where there was a fulling mill, and [the tower] crashed into a street opposite S. Chirico and killed many people, great and small.

Anno domini 1349 fu in Viterbo gran tremuoto, e fece cascare una torre, che stava dirimpetto a S. Stefano nelle case de' Gatteschi, e case nella facciata di S. Stefano, e fece cascare la loggia avanti detta chiesa e uccise gran quantità di gente, che stavano a vedere il corpo di Cristo la domenica mattina, che solo uno campò, chiamato Boccapane, e stette sotterrato fra li sassi tre di e tre notti, e governato per un poco di pertuso, e similmente cascò un'altra torre nella contrada di S. Chirico, che fece cascare tante case che poi furono rifatte le nuove botteghe, e stava detta torre, accanto ad una porticella, che andava al fossato da Sonva, ove era una valchiera, e scaricò insino ad una strada dirimpetto a S. Chirico, et uccise assai persone grandi e piccole.

Tuscania [formerly **Toscanello**] (province of Viterbo)

The castle was badly damaged. Two months after the earthquake, pope Clement VI allocated 500 gold florins towards the cost of repairs (see the following location).

Onano (province of Frosinone)

The castle tower completely collapsed, as did most of the other castle buildings. Two months after the earthquake, pope Clement VI allocated 400 florins for repair work.

The source for both Tuscania and Onano is an order dated 13 November 1349 from

Clement VI to his treasurer, requesting him to provide the necessary funds for repair work (Archivio Segreto Vaticano, *Registra Vaticana*, vol.143, fol.101):

"To our beloved son, the treasurer of the Patrimony of St.Peter in *Tuscia* on our behalf and that of the Roman Church. A reliable report has informed us of the collapse [...] of the tower of Onano castle in its entirety [...] and most of the castle buildings, and says that the castle of the town of Tuscanella has split open because of the earthquake which has violently shaken those places, and that [...] the tower and buildings of Onano castle require four hundred [gold florins] and the castle of the said town of Tuscanella five hundred gold florins in order to pay for adequate repairs.[...] Given at Avignon on the Ides of November [13 November 1349] in the eighth year [of the pontificate of Clement VI]".

Dilecto filio thesaurario Patrimoni beati Petri in Tuscia pro nobis et ecclesia Romana. Ad audienciam nostram insinuacio fidedigna perduxit quod [...] turris roche Onani [...] totaliter cum magna parte edificiorum ipsius roche corruerunt et quod rocha Onani civitatis Tuscanelle fissa est propter terremotum, qui partes illas graviter conquassit, [...] et turris cum edificiis ipsius roche Onani castrorum pro quadrigentis, et rocha civitatis Tuscanelle predictae pro quingentis florenis auri, possent commode reparari. [...] Datum Avinionis idibus novembris anno octavo.

Orvieto (province of Terni)

There was damage to the roof of the town hall, rendering it unusable, and also to the prison. The *podestà* and his staff, abandoned the *palazzo*, and took up residence in a nearby house. The damage to buildings, towers and palaces was so serious that the commune was obliged to issue a *riformagione* ordering the demolition of houses and other buildings which had been reduced to a dangerous state by the earthquake.

A column and the walls of the church of S.Andrea were also probably damaged. The water in a fountain became cloudy for more than 12 days.

The continued functioning of the judicial system was ensured by means of an enactment of the council authorising the *podestà* to continue trials outside the town hall. On 20 October and 3 November 1349, the town council allocated a total of 250 *lire* for repair work. Another enactment, on 25 November, gave permission for the demolition of houses which had been badly damaged in the earthquake. On 5 September 1350, the council allocated 15 florins for repairs to the column and walls of the church of S.Andrea, which stood next to the town hall; but there is no specific mention of the earthquake in the enactment.

The sources are public documents of great administrative and institutional importance, namely communal *riformagioni* containing enactments made by the city council for the repair of earthquake damage. There are five of these enactments made immediately after the earthquake (between 12 September and 25 November 1349), and one later enactment, made in September 1350. Further details about earthquake effects can be found in the *Ephemerides urbevetanae*. In the *riformagione* of 12 September 1349, the city council laid down that city officials could carry on their activities outside the town hall, which had been rendered unusable by the earthquake (Archivio di Stato, Terni, Sezione di Orvieto, *Riformagioni*, vol.136, fol.65v.):

"On 12 of the said month of September [1349] [...] That the *podestà* and *capitano*, because of the earthquakes, may carry out their duties outside the town hall. [...] The said council and its councillors [of the city of Orvieto] meeting in the said buildings and gathered together as set out above, bearing in mind that, because of the terrible earthquakes which struck the city and surrounding area a short while ago, the *podestà* and the *capitano* of the city of Orvieto, with their staff and household have left the *palazzi* of the commune and are living in guest houses and other places, [...] order, establish and decree that the *podestà*, the *capitano* and their staff shall be enti-

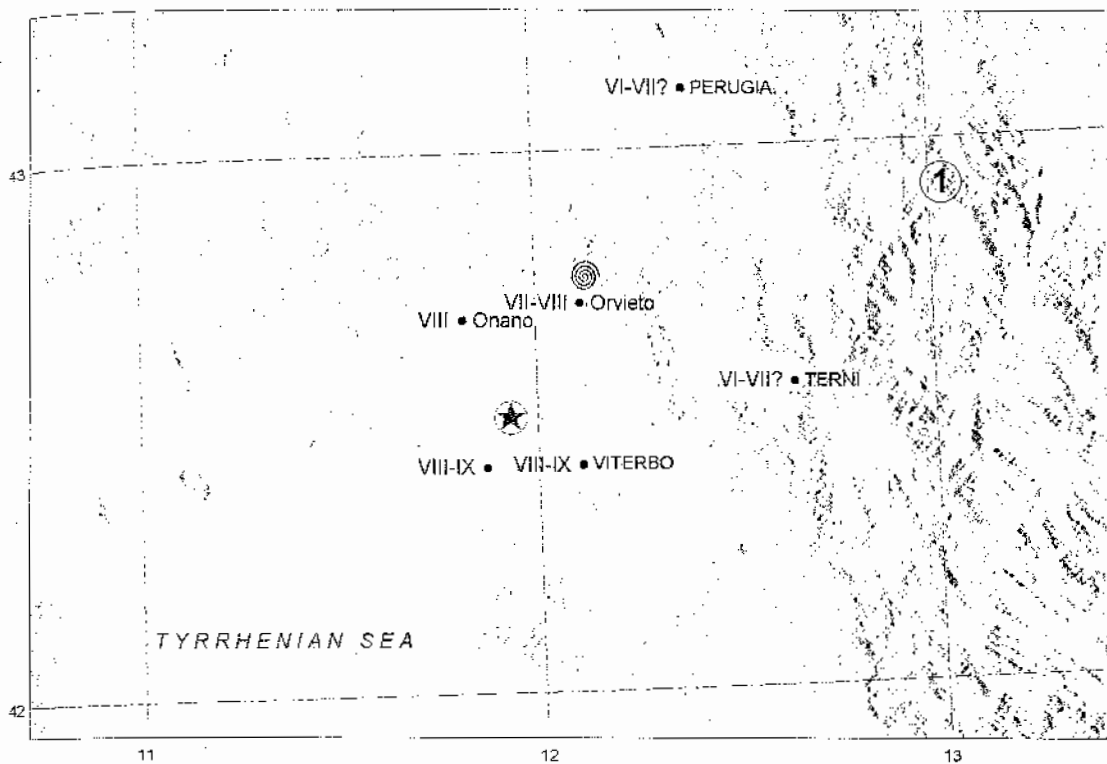


fig. 87

tled to exercise judicial activities, both civil and criminal, within the gates of the city”.

Die XII dicti mensis septembris [...] Quod potestas et capitaneus, occasione terremotus, possint eorum officia extra palatia exercere. [...] Dictum consilium et consilarii eius in dictis domibus congregati et adunati ut supra considerantes quod propter novitates magni et orribilis terremotus pridem in dicta civitate et aliis partibus circumquamque occursi presentes domini potestas et capitaneus civitatis Urbisveteris et quilibet eorum, cum eorum officialibus et familia, palatia communis et populi inhabitata dimiserunt et in hospitibus et locis aliis commorentur [...] ordinarunt, statuerunt, firmaverunt et decreverunt quod ipsi domini potestas et capitaneus et quilibet eorum [...] poterint et possint eorum officia in civilibus et criminalibus, dampnis datis et distractis exercuisse in preteritum et exercere imposterum intus ianuas civitatis.

By means of a *riformazione* dated 6 October 1349, the town council decided to pay the rent for the 15 days which the *podestà* and his staff had spent in a guest house, since the town hall was damaged (Archivio di Stato, Terni, Sezione di Orvieto, *Riformazioni*, vol.136, fol.72v):

“[The town councillors] having regard to the fact that the noble Giovanni di Tommaso, *podestà* of Orvieto, being afraid to continue living in the town hall because it was damaged in the recent earthquakes which struck the city so violently, at the request of the *priori del popolo* and city officials took residence with his staff at the guest house of Giovanni di Piero Vasconis for 15 days, [...], have laid down, ordered and decreed that the town finance office can and should undertake to pay twenty-two *librae* and ten *soldi* of council money for the said 15 days to the aforesaid Giovanni di Piero for rent at the said guest house”.

Item considerantes ed advertentes quod vir nobilis et potens Iohannes domini Tomassi presens honorabilis potestas civitatis Urbisveteris, timens et merito in palatio communis morari ob ruinam quam evidenter ipsum palatium minabatur occasione

1349
September 9

0 30 km

terremotus pridem in dicta civitate vehementer occursi, de voluntate dominorum priorum populi cum suis officialibus, equis et familia ivit et stetit in hospitio Iohannis Perii Vasconis diebus quindecim [...], statuerunt, ordinauerunt et decreuerunt quod camera communis Urbis veteris de ipsius communis pecunia possit et teneatur et debeat cum effectu dare et solvere pro pensione et nomine pensionis dicti hospitii prefato Iohannis Perii pro dictis XV diebus viginti duas libras et decem soldos denariurum curie.

The *riformagioni* of 20 October and 3 November 1349 show that sums of 50 and 200 *lire* were allocated to pay for damage to the prison and the roof of the town hall, where the headquarters of the *podestà* was also situated.

The *riformagione* of 20 October (Archivio di Stato, Terni, Sezione di Orvieto, *Riformagioni*, vol.136) states:

“*maestro Gianni, son of maestro Damiano, blacksmith and one of the said councillors [...] said that the prison in the palace of podestà needed repairs and reconstruction work [...] and that the cost of this work and of repairing the roof of the same palazzo would be fifty librae denariorum*”.

Magister Iannis magistri Damiani faber, unus ex dictis consiliariis, [...] dixit [...] quod cum carcere palatii domini potestatis indigeat reparatione et acconcimine [...] liceat absque sui preiudicio, expendere usque ad quantitatem quinquaginta librarum denariorum in dictis acconcime et reparatione et acconcimine tecti palatii supradicti.

The *riformagione* of 3 November 1349 (Archivio di Stato, Terni, Sezione di Orvieto, *Riformagioni*, vol.136) states:

“In the year of Our Lord 1349 [...] on 3 November. The council of the *priori del popolo* of Orvieto [...], having in mind that the town hall of Orvieto obviously requires repairs and restoration work to the roof, the prison area and various other places, [...] orders [...] that a total sum of up to two hundred *librae denariorum* shall be spent on this work”.

Anno Domini millesimo CCCXLVIII [...]. die tertia mensis novembris. Consilio prudentum virorum dominorum priorum urbeveterani populi [...], considerantes [...] quod palatium communis Urbis veteris indiget reparatione et acconcimine, tam circa tectum, quam etiam circa carcerem ipsius palatii et circa loca et in locis aliis dicti palatii, prout evidenter patere potest, [...] statuerunt [...] quod in accocimine et reparatione predictis et pro actatione dicti palatii [...] liceat [...] expendere usque ad quantitatem ducentarum librarum denariorum.

By means of a *riformagione* dated 25 November 1349, the town council authorised the total or partial demolition of buildings in a dangerous state (Archivio di Stato, Terni, Sezione di Orvieto, *Riformagioni*, vol.136, fols.77v.-78r):

“[...] houses and other buildings damaged by the earthquake or some other unforeseen cause may be demolished, wholly or in part, in order that they may be better rebuilt, without incurring any penalty”.

[...] domus vero et hedificia que quamlibet ruina minarentur occasione terremotus vel alterius casus inopinati vel devastanda pro rehedificando ipsa cum melioramento pro parte vel in totum scarvari et dirrui possint sine pena.

By means of a *riformagione* dated 5 September 1350, the town council decided to allocate 15 florins for repairs to the church of S.Andrea (Archivio di Stato, Terni, Sezione di Orvieto, *Riformagioni*, vol.137):

“5 September [1350]. [...] The council of the *priori del popolo* of Orvieto and the *otto sapienti* meeting as above [...] ordered that the finance office of Orvieto should pay to the canons of the church of S.Andrea the sum of fifteen gold florins for repairs to the

column and walls of the said church situated by the town hall, for the latter might otherwise be in danger of serious damage [...]”.

Die V. mensis septembris [...] Consilio dominorum priorum populi urbevetani et octo sapientum predicto adunato et congregato ut supra [...] ordinaverunt quod camera communis urbevetani que qualibet ipsius communi pecunia det et solvat et dare et solvere possit et teneatur et debeat cum effectu ad requisitionem canonicorum sive presbiterorum ecclesie Sancti Andree pro accoñcimine et reparatione columne et muritii ecclesie Sancti Andree predicti faciendi subter palatium communis urbevetani quindecim florenos de auro, cum nisi dicta reparetur columna, palatium ipsum pro maiori parte minetur ruinam quod in dicti communis dampnum redundaret et periculum et iacturam.

A contemporary local chronicle, the *Discorso storico* (p.29), reports that one of the effects of the earthquake was the clouding of the water in a fountain for more than 12 days:

“On Wednesday, less than half way through the third hour, that is to say on 9 September in the year 1349, there was a very great earthquake, which brought down many walls and large buildings, towers and palaces; and the running water which comes to the fountain in Orvieto became so cloudy that it looked like milk or liquid mud. And the water remained very cloudy for more than twelve days. And it was the same in many other towns and villages, so that people were very frightened and workmen spent more than six days in idleness. And every day processions and penances were held”.

Mercordi, innanzi menza terza, cioè fu a dì nove di settembre, anno mille e trecento quaranta nove, fu sì grandissimo terremoto, che caddero molte muraglie et grandi edefici et torri et palazzi; et l'acqua viva, che viene in Orvieto alla fontana, intorbidò sì, che pareva che fosse latte et creta stemperata. Et durò questa acqua così torbida più di dodici giorni. Et così comè fu in Orvieto, così fu in molte altre città e castella, onde che la gente impauriro molto et stettero più di sei giorni che li artefici non lavoravano. Et ogni dì si facevano processioni et discipline.

Perugia

Giovanni da Bazzano was a notary from Modena who wrote at the time of the earthquakes, but he was a long way from the major effects areas. He records very serious damage to towers and other buildings in Perugia. Archive research into the collection of documents produced by local officials and religious bodies did not lead to the discovery of any documents which recorded the earthquake, but it must be pointed out that the registers of the *Consigli e riformanze*, containing decisions made by local councils, are missing for the years 1327-1350 and 1352-1375.

However, there are certain factors which lead us to believe that damage cannot have been serious. In the first place, the local judicial authorities (*Capitano del Popolo* and *Podestà*) continued to work normally; and in addition, there is no trace of an earthquake in the documents of the authorities responsible either for the city's finances (*Annona*, *Conservatori della moneta* and *Gabelle*) or for public works, or in the archive collections of religious bodies. It therefore seems appropriate to scale down the effects described by Giovanni da Bazzano. In any case, his text pays no particular attention to Perugia, simply attributing very serious damage to three towns (L'Aquila, Perugia and Ascoli Piceno) which were far from where he was living. What he wrote was (p.147):

“In the said year [1349], on 1 September, almost at the second hour and before the third, the world was struck by an earthquake [...]. In Apulia and those parts several towns collapsed with most of their buildings [...] and the town of Perugia, too, was damaged in the said earthquake, for many towers and other buildings collapsed there”.

Dicto millesimo primo septembris quasi in hora secunda et ante terciam fuit

terraemotus in orbe [...]. In Apulea [et] in partibus illis plures terrae et edificia ibi existentes pro parte maxima corruerunt, [...] et etiam civitas Perusina [propter] dictum terraemotum cum damno quia ibi multae turres et edificia corruerunt.

In the lato local historiographical tradition, this earthquake is held responsible for damage to the fontana maggiore, also known as the fontana di Piazza.

Terni

Between September and mid-November 1349 there were many earthquakes.

Although this information is generic and indirect, it seems to be reliable. It appears in a history of the town of Terni written by a scholar named Angeloni (1646), who lived in the second half of the 16th and the first half of the 17th century. He gives as his source a passage from the chronicles of Merlino di Filippo, a 14th century writer.

Bologna

The shock of 9 September 1349 was felt there.

The source is the contemporary local chronicle by Pietro Villola (vol.2, p.597):

“In that same year [1349], on 9 September, there was an earthquake; it happened in the morning, before the third hour”.

In lo dicto millesimo di viiii^o de setembre vene lo teramoto; fo la doman innanzi terza.

The same information is repeated in the *Cronaca Rampona*, another local chronicle.

Modena

The shock was felt by some people, but far fewer than those who were unaware of it.

The source is the contemporary *Chronicon Mutinense* by Giovanni da Bazzano (p.147), who dates the earthquake to 1 September 1349 (for the chronological uncertainties pertaining to this source, see the paragraph “problems of chronology”). The text is as follows:

“In that year [1349], on the first of September, at about the second hour and before the third, there was an earthquake in the world, and it was stronger in the East than in the West; some people felt the earthquake in the city of Modena, but few compared with those who did not feel it”.

Dicto millesimo primo septembris quasi in hora secunda et ante terciam fuit terraemotus in orbe, scilicet fortior fuit in partibus Orientis quam Occidentis: quem terraemotum aliqui senserunt in civitate Mutinae, pauci respectu aliorum qui non senserunt.

Pisa

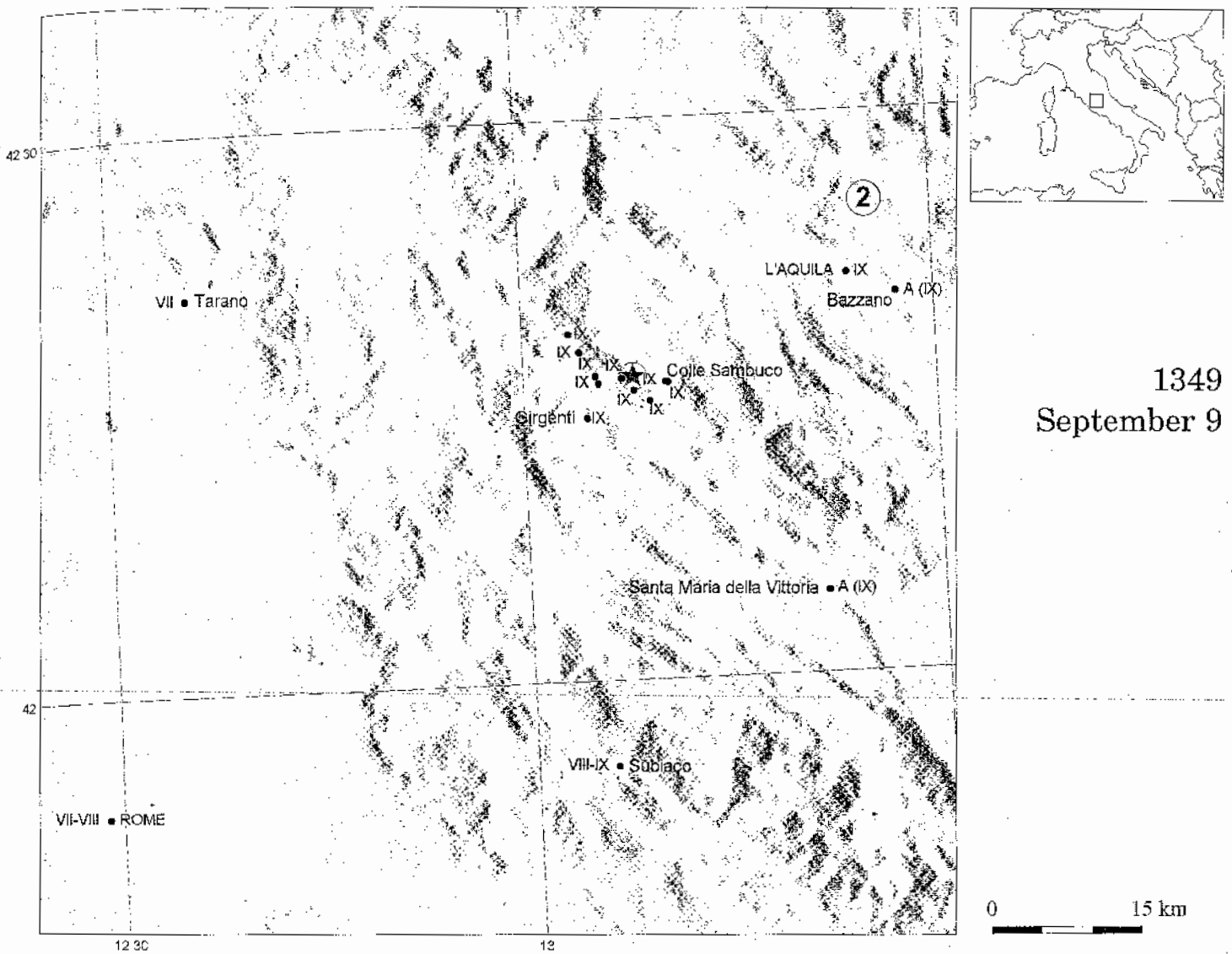
The shock was not felt: the *Secunda vita Clementis VI* excludes Pisa from the felt area.

“In that same year [1349] and during the same pontificate [that of Clement VI, 1342-1352] already mentioned, namely on 9 September at about the first hour, there were very great earthquakes in the Kingdom of Sicily, in Rome, and in neighbouring areas up to but not including the city of Pisa”.

Eodem anno et Pontificatu supradictis, IX. videlicet die Septembris circa primam horam, terraemotus maximi fuerunt in Regno Siciliae, in Urbe, ac partibus convicinis usque ad Civitatem Pisanam exclusive.

AREA ② Colle Sambuco, Gamagna, Girgenti, Mareri, Petrella Salto, Poggio Poponesco, Radicaro, Santa Maria, Staffoli, Vallebona (province of Rieti)

The above ten localities (in the present-day province of Rieti) suffered major effects: there were widespread collapses, and buildings were so badly damaged that some local people abandoned their homes. There is evidence for this in a document drawn up by the royal authorities in Naples, in which their state of need is recognised, and in order to prevent depopulation they are granted exemption from half their taxes.



1349
September 9

fig. 88

The source in question is a privilege issued in Naples on 28 June 1352 in favour of some communities in Abruzzo Ulteriore (in the present-day province of Rieti) by king Louis of Anjou and queen Joanna, reducing by half the tax burden payable to the Royal Court. The original document was formerly preserved in the Archivio della Regia Zecca, that is to say the Archivio della Cancelleria Angioina, but is now lost. We know its contents, however, from the transcription by Bonito (1691, pp.570-1). The fact that the indiction is given as the second when it should be the fifth, may be a transcription error by Bonito:

"To the *giustiziere* [governor] of Abruzzo beyond the river Pescara etc., We have recently read at our audience in the presence of our faithful servants Nicola and Lippo di Mario, the petition of the lords of the fortified settlements of [Colle] Sambuco, Poggio [Santa] Maria, Radicaro, Gamagna, Poggio Pecunisco [Poponescol], Mareri, Girgenti, Vallebona, Petrella and Staffoli, situated in *Abruzzo Ultra*, to the effect that the said settlements, partly as a result of the recent violent earthquake, which caused their buildings to collapse or suffer damage, partly because of the intolerable tax burden, and no less because of divisions in the past and the fresh wars which have disturbed

the kingdom owing to their proximity to the territories of the Empire, are reduced to a state of extreme penury and have been abandoned by their usual inhabitants, with the result that their economic prospects are reduced, since those few who have remained in residence are quite unable to bear the burden of the taxes and contributions which have been imposed on them in the past and will be imposed in the future, and rather than do so they think it preferable to give up living in these settlements and go elsewhere. On investigation, these claims have proved to be true. Therefore, they are exempted from half of the general taxes and contributions etc. Given on 28 June, in the second indiction, in the year 1352. By king Louis and queen Joanna etc.”

Iustituario Aprutii ultra flumen Piscariae, etc. lecta dudum in Auditorio nostro Nicolai, et Lippi de Mario, fidelium nostrorum, Dominorum Castri Sambugi, Podii Marii, Castri Radicarii, Castri Germaniae, Castri Podii Pecunischi, Castri Marerii, Castri Grigenti, Castri Vallisbonae, Castri Petrellae, et Castri Staffilium sitorum in Apr. ult. oblata petitio continebat, quod praedicta Castra, tum propter impetum generalis Terraemotus praeteriti proximo, eorum aedificia data sunt in praecipitem, in ruinam, tum propter etiam intolerabilia onera fiscalium collectarum, nec minus praeteritorum discrimina temporum, et guerrarum etiam novitates, quae fremuerunt in Regno, et propter vicinitatem terrarum Imperii ad extremam paupertatis inopiam sunt reducta, et a suis Incolis solitis derelicta, adeo nunc est facultatibus diminuta, quod illi pauci, qui remanserunt ibidem nullo modo supportare possunt onera ipsarum Collectarum, et subventionum, quae pro tempore impositae sunt, et imponentur eis in posterum, potius cogentur ipsorum Castrorum deserere incolatum, et alibi se transferre; Unde facta Inquisitione, vera inventa sunt exposita. Propterea relaxatur eis medietas generalium Collectarum, et subventionum, etc. sub datum die 28. Iunii secundae Indictionis anno 1352. Per Ludovicum, et Ioannam Reges, etc.

Bazzano (province of L'Aquila)

The church of S.Giusta was badly damaged. A notarial deed dated 11 January 1367 shows that the canons and provost asked the bishop's permission to sell a vineyard in order to pay for repairs to the church (Biblioteca Provinciale "S.Tommasi", L'Aquila, 582, E.Mariani, *Memorie istoriche della città di Aquila*, 19th c.).

Santa Maria della Vittoria (province of L'Aquila)

The convent was so badly damaged that it had to be rebuilt. A notarial deed of 1350, quoted in Mattiocco (1976, p.140), shows that the friars sold a house in Sulmona in order to be able to rebuild the convent.

L'Aquila

A large part of the town suffered serious damage. The cathedral collapsed, as well as many bell-towers, towers and large buildings. The church of S.Maria di Collemaggio suffered collapses and other serious damage. There were 800 victims, out of an estimated total population of several thousand. The populace was obliged to abandon the town, and spent 9 weeks living in the country. Count Camponeschi, the lord of the town, had some palisades erected at places where the town walls had collapsed, in order to prevent the inhabitants from fleeing. In 1353, pope Innocent VI granted indulgences of one year and forty days to those who contributed to funds for the restoration of the cathedral.

Sources for this earthquake are the contemporary chronicles of Buccio di Ranallo and Matteo Villani, a letter dated 2 June 1353 from pope Innocent VI, and a deed of sale dated 1 June 1374.

Buccio di Ranallo's *Cronaca Aquilana* is a verse composition in medieval Italian, in which we read (pp.188-90):

"Just when we thought we were in a safer place, there suddenly came a greater earthquake than any seen since the birth of Christ; it was difficult to find anyone who was not dazed by it. It was reckoned that eight hundred people died in the earthquake ruins. Some were seen wailing piteously, some wept over their sons, wives or brothers. Some wept over their mothers, father or sisters; some beat their breasts and others their jaws. And they went clearing every street and alley with words of misery as they sought for bodies. That was a time when we had much more cold than warmth; and we little repented for our sins! It was in the year of Our Lord 1349, believe me for I do not lie, when this earthquake and destruction occurred; and may God save those who died. For L'Aquila was reduced to such a state, deprived of so many churches and other buildings, and no longer surrounded by walls, that many thought it was no longer inhabited. And indeed many began to flee, for they wanted to go and live outside [the town], thinking that L'Aquila would never be rebuilt. When the count heard about this, he began to ponder what was to be done. Then the count saw how desolate and reduced to ruins the place was as a result of the earthquake; the walls were down and had not been repaired; so he immediately decided to erect a palisade. On his orders palisades were made of good strong wood, and placed close together; they surrounded the town along many districts and were very useful, because they provided us with protection. When houses collapsed, there was so much dust that people could not see one another that morning; many were killed [by the earthquake] quite apart from the collapses. They must have become well acquainted with the power of God! Now what wrecked buildings and houses could be seen! All the churches were razed to the ground, and, if the truth be known, that was the worst damage suffered by the town, apart from the victims. The streets were full of rubble and wood; it would be a lengthy matter for L'Aquila to clear up the ruins! There was great distress; our peasants came

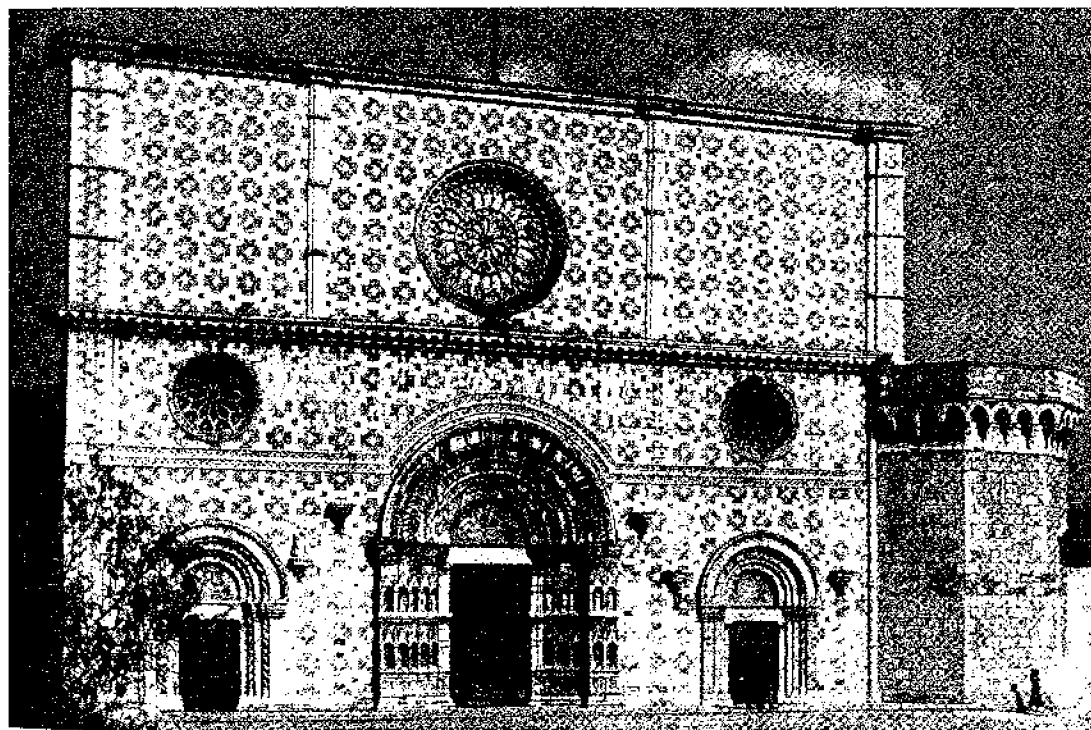


fig. 89 L'Aquila, church of S. Maria di Collemaggio, founded in 1287. According to a document drawn up by the prior and monks of the Collemaggio monastery, the church suffered serious damage in the 1349 earthquake. In 1374 the monks sold a piece of land in order to acquire enough money to pay the master builders who had carried out the restoration work.

from the countryside to clear the streets. We did not stay at home, but erected tents; we were away from our homes for more than nine weeks”.

Quando credevamo stare in loco più tuto, / Subitamente venne sì gran terremoto, / Dalla morte de Christo non fo mayure veduto; / Appena homo trovòsenci che non gesse storduto. / De persone ottocento d'Aquila fo stimate / Che per lo terremoto foro morte et sotterrate. / Chi se vedeva strillare et fare pietate, / Chi plangea lo filio, chi mollie et chi lo frate. / Chi plangeva la matre, chi patre et chi sorella, / Chi se grattava lo petto, et chi la mascella; / Et geano scommorando omne strada et ruella, / Per ritrovare li corpi, con amara favella. / Più frido assai che calla in quillo tempo abembo; / Et de nostri peccati poco ne penetembo! / Correa li anni Domini mille et trecento / Et plu quaranta nove, credate ca non mento, / Quando fo lo terremoto et quisto desertamento; / Et quilli che moreronci, Dio ly agia ad salvamento! / Però che era l'Aquila così male adrivata, / De ecclesie et edifitia cotanto desertata, / Et anchi delle mura non era circondata, / Multi homini credevano non foxe habitata. / Et anchi comensaro parichi ad scommorare, / Ché nne voleano gire de fore ad abitare; / Credeanose che Aquila non se degia refare. / Lo conte sappe questo, abese ad conselliare. / Vedendo poi lo conte la terra desolata / Per granni terremuti così male adobata; / Le mura erano ad terra, non era reparata; / Pensò subitamente de fare la sticconata. / Como illo comandò, foro facti li sticcati / De bono lename grosso, multo ben chiovati; / Sticcavano la terra per multi vicinati, / Et forone grandi utili, ca stavamo inserrati. / Quando le case cadero, tanta era polverina, / Non vedea l'uno l'altro in quella matina; / Multi ne abe ad occidere senza male de ruina. / Ben se lli dé ad cognoscere la potentia divina! / Or chi vedesse edefitia et case derupate! / Tuctequante le ecclesie erano atterrate, / Che fo lo majure danno che avesse la citate, / Salvo la morte delli homini, ad dire la veritate. / Le strade erano incomorate de prete et de legname; / Forria forte ad Abruczo scommorare lo marrame! / Assay fo granne affanno; vinneroce tuctotame / Li nostri contadini ad scomborare le strade. / Non jaceamo in casa, ma le logie fecemmo; / Più che nove semane pur de fore jacquembo.

Buccio di Ranallo only gives the year of the earthquake; but the early 15th century *Cronachetta anonima delle cose dell'Aquila dell'anno 1055-1414*, published in Pansa (1902, p.4) gives the date as 9 September:

“and there were great earthquakes on 9 September”.

e furono li Terramuti grandi adì 9 settembre.

Matteo Villani's *Cronaca* (ed. Porta 1995, I, pp.87-7), on the other hand, gives the date as 10 September:

“On the earthquakes which occurred in Italy.

In this year [1349], on 10 September, extraordinary and amazing earthquakes began in Italy, and in many parts of the world they lasted for a number of days [...] The city of L'Aquila was almost destroyed as a result, for all the churches and large buildings in the city collapsed, killing many men and women; and since these earthquakes lasted for a number of days, all the inhabitants, and strangers as well, began to spend all day and all night in the squares and out in the fields, as long as the movement of the earth continued, and it lasted for eight days or more. And they [the earthquakes] were so great that it was difficult for a man to stand up on level ground”.

Di tremuoti furono in Italia.

In questo anno, a di X di settembre, si cominciarono in Italia tremuoti disusati e maravigliosi, i quali i[n] molte parti del mondo durarono più di [...] La città dell'Aquila ne fu quasi distrutta, che tutte le chiese e' grandi difici della città caddono, con grande mortalità d'uomini e di femine; e durando per più di i detti tremuoti, tutti i cittadini, ed eziandio i forestieri, si missono a stare il dì e lla notte su per le piazze e di fuori a campo, mentre che quello movimento della terra fu, che durò otto dì e più. Ed erano sì grandi,

che in piana terra avea l'uomo fatica di potersi tenere in piede.

In a letter dated 2 June 1353, pope Innocent VI granted an indulgence to those who contributed to the restoration of the cathedral (Archivio Segreto Vaticano, *Registra Vaticana*, vol.125, fol.180v.):

"To all the faithful in Christ who receive this letter, greetings etc. [...] Since we have learned from petitions recently presented by our venerable brother Isaia, bishop of L'Aquila, that of the old cathedral church of L'Aquila built outside the town and the later one built inside, the old church outside the town, containing the bodies of the blessed Massimo martyr and Raniero the Confessor, was suddenly razed to the ground not long ago in the extraordinary earthquake which occurred in the area, together with episcopal houses and many others belonging to the church, together with turrets, towers and large buildings. And since we have also learned that the income and earnings of the said church have become so modest and slight that they are insufficient for the maintenance of the bishop and the reconstruction of the church, unless they are subsidised by the Church and the charitable alms of the faithful, we therefore beg your community and exhort you in the name of God for the remission of sins that you arrange for the reconstruction of the said church with part of the goods which God has committed to you, and to give your alms and charitable contributions so that thanks to your support [...] the said church may be repaired [...]. We therefore [...] grant one year and forty days' indulgence to all those who truly repent and make confession and who contribute [...]. Given at Villeneuve in the diocese of Avignon on the fourth day before the Nones of June [2 June 1353], in the first year [of the pontificate of Innocent VI]".

Universis Christi fidelibus presentes litteras inspecturis salutem etc. [...]. Cum itaque sicut ex petitionis serie venerabilis fratris nostri Ysah episcopi Aquilensis nobis nuper exhibite precepimus ecclesiam Aquilensem tam extra ubi antiquitas quam intra civitatem Aquilensem in qua postmodum constructa extitit in qua ecclesia extra antiqua beatorum Maximi martiris et Ranerii confessoris corpora requiescunt cum episcopalibus domibus et multis aliis earumdem ecclesie et civitatibus pinnaculis turribus et magnis edificiis usque ad fundamentum ex nimio terremotu qui in illis partibus et precipue in civitate praedicta a modicis retro temporibus repente corruerit ac redditus et proventus ecclesie eiusdem adeo modici exiles ac tenues sint effici quod ad sustentationem episcopi et reparacionem ecclesie predictorum nequeunt sufficere nisi per favorem sedis apostolice et pias fidelium elemosinas succurratur eisdem universitatem vestram rogamus et hortamur in domino vobis in remissionem peccaminum iniungentes quatenus ad reparacionem dicte ecclesie de bonis a deo vobis collatis vestras elemosinas et pia caritatis subsidia erogetis ut per subvencionem vestram [...] dictam ecclesiam valeat reparari [...]. Nos enim [...] omnibus vere penitentibus et confessis qui manus ad hoc porrexerint adiutrices unum annum et quadraginta dies de iniunctis eis penitentiis [...]. Datum apud Villanovam Avinionensis diocesis IIII none junii anno primo.

A deed of sale dated 1 June 1374 (published in Pansa 1900, p.260) provides evidence of damage suffered by the church of S.Maria di Collemaggio:

"1374. First of June. At the monastery of Collemaggio. Brother Petrus De Anglone, the prior, and sixteen friars of the said monastery who are in need of money to pay the master builders of the said church of Collemaggio which was destroyed by the force of the great earthquake [of 1349] which occurred some time ago at L'Aquila etc., with the approval of brother Ioannes abbot of S.Spirito etc., have sold to Petrus Iacobi Vincenti of Santa Maria in Furfona, a picce of land in the territory of Bagno, at the place called Campu, for 32 gold ducats".

1374. Primo Iunij. In Monasterio Collismadij - F. Petrus de Anglone Prior, et fratres

sexdecim conventuales dicti Mon.rij indingentes pecunijs pro Magistris fabricatoribus in dicta Ecclesia Collismadij diruta impetu magni terraemotus iam contingentis in Aquila, etc., cum licentia F.Ioannis Abbatis S.ti Spiritus etc., vendiderunt Petro Iacobi Vincentij de Sancta Maria in Furfona, petiam terrae in territorio Balnei, ubi dicitur Campu, pro praetio ducatorum auri 32.

Subiaco (province of Rome)

According to the monastery chronicle, the church of S.Scolastica was destroyed, together with the monastery and castle.

Our source is the contemporary *Chronicon Sublacense* (p.44):

"In the year of Our Lord 1349, the abbot after Giovanni was Pietro of Perugia, in whose time an earthquake almost completely destroyed the monastery and *Rocca* of Subiaco and other fortified abbey buildings. The abbot himself was in his room in the castle when the destruction occurred, and he was so frightened that he lived for only a short while after [the earthquake]".

Anno domini MCCCXLIX post Iohannem fuit Petrus abbas nacione perusinus cuius tempore terremotus monasterium et roccam Sublaci et nonnullas alias roccas abacie ad solum pene prostravit in qua ruina cum esset idem abbas in camera sua apud roccam sublacensem territus parvo tempore supervixit.

Rome

There was widespread damage affecting many important monuments.

Basilicas and churches:

- Dodici Apostoli: damaged; no other details are available;
- S.Giovanni in Laterano: the roof collapsed;
- S.Maria in Aracoeli: badly shaken; this is probably the church which Petrarch calls "Virginis domus";
- S.Paolo fuori le Mura: badly damaged; the bell-tower collapsed, as well as part of the loggia; the building was already in a precarious state before the earthquake because of its age;
- S.Pietro: it suffered unspecified damage, which was repaired on the orders of pope Clement VI;

Towers:

- delle Milizie (built in the 13th c.): partly collapsed;
- dei Conti (built in the early 13th c. by pope Innocent III, 1198-1216): large cracks appeared, and the upper part collapsed.

There is evidence of damage in Rome in many documentary and chronicle sources. Papal orders and letters written by Clement VI between 1350 and 1351 pay particular attention to damage to the principal basilicas (partly because 1350 was the year of the second jubilee). The picture of effects on the principal monuments in Rome is enlarged and enriched by the contemporary chronicles of Matteo Villani, Giovanni da Bazzano and Henricus Surdus de Selbach, and especially by three letters from Francesco Petrarca.

Pope Clement VI sent three orders to Ponzio, bishop of Orvieto and vicar of Rome.

The order dated 20 February 1350 concerns the basilica of S.Pietro (Archivio Segreto Vaticano, *Registra Vaticana*, vol.143, fol.163v.):

"The disquiet caused by the news that an earthquake has damaged the basilica of the Prince of the Apostles [S.Pietro in Rome] has filled our mind with bitterness and aroused great compassion towards the church. Therefore, since we anxiously desire that it should be repaired, [...] we have decided that you should choose on our authority an honest man [...] belonging to the secular clergy, or a regular of any religious order, as *altararius* [...] of the said basilica [...] Given at Avignon on the tenth day

before the Calends of March [20 February 1350], in the eighth year [of the pontificate of Clemente VI].”

venerande Basilice [Principis Apostolorum] de urbe qua eam terremotus fertur quassasse commocio animum nostrum multo saciavit absinchio multaque ad illam compassione commovit. Propter quod de reparatione illius solicite cogitantes [...] mandamus [...] aliquem probum virum [...] secularem vel et regularem cuiscumque professionis religiosi et ordinis sicut altararium auctoritate nostro in Basilica deputed predicta [...] Datum Avinionis X Kalendas martii anno octavo.

The order dated 12 May 1350 concerns the basilica of S. Paolo fuori le Mura (Archivio Segreto Vaticano, *Registra Vaticana*, vol.143, fol.211r.):

“considering how much the venerable basilica of S. Paolo the Apostle in Rome has been troubled and shaken by old age and earthquakes and is in need of repair, in our desire to find suitable remedies, we have decided that from now on offerings already made or which will be made in the said basilica in this fiftieth jubilee year shall be devoted to its restoration”.

attendentes quantum venerabilis basilica Beati Pauli apostoli de Urbe vetustate quassata et fatigata terremotibus indiget reparari super hiis oportuna remedia prospicem cupientes omnes oblationes factas iam et facendas de cetero in basilica memorata hoc instanti anno quinquagesimo iubileo operi fabrice basilice deputavimus memorate.



ROME
monuments damaged
in the earthquakes
of September 1349

Churches
S. Pietro
Dodici Apostoli
S. Giovanni in Laterano
S. Paolo fuori le Mura
S. Maria in Aracoeli
Towers
delle Milizie
dei Conti

fig. 90 14th century map of Rome showing the most important buildings in the city (Biblioteca Nazionale Marciana, *Mss. Latini*, Z. 399 (=1610), Paulinus, *Chronologia Magna*, fol.982).

Another order, also dated 12 May 1350, concerns the basilica of S. Giovanni in Laterano (Archivio Segreto Vaticano, *Registra Vaticana*, vol.143, fol.212v.):

"[...] since we desire that repairs and all other necessities for the Lateran church shall be undertaken, we have disposed that offerings which the church receives in this fiftieth jubilee year shall be devoted to that purpose."

[...] reparationibus et aliis oportunitatibus ecclesie Lateranensis prospicere cupientes, oblationes factas et faciendas in eadem ecclesia hoc presenti anno quinquagesimo iubileo reparationi et aliis oportunitatibus huiusmodi duximus deputandas.

In a letter dated 7 July 1351, Clement VI exhorted the faithful to contribute to the restoration of the basilica of S. Paolo fuori le Mura (Archivio Segreto Vaticano, *Registra Vaticana*, vol.145, fol.22):

"To all the faithful in Christ who shall see this letter, good health and [apostolic blessing]. The fact that the venerable basilica of the city [of Rome] dedicated to S. Paolo the Apostle, *doctor gentium*, in recent days was shaken in many parts and partly demolished by the earthquake [of 1349], urges us all the more to have it repaired because the outstanding merits of the apostle make the matter one of urgency, and because it is clear that the structure of this very ancient church is another reason why it needs the benefits of fresh repairs. [...] Avignon, on the Nones of July [7 July 1351], in the tenth year [of the pontificate of Clement VI]".

Universis Christi fidelibus presentes litteras inspecturis, salutem et cetera ... [Apostolicam benedictionem]. Doctoris gentium beati Pauli apostoli veneranda Basilica de urbe quam diebus preteritis tremotus in plerisque suis partibus conquassavit et in quibusdam diruens deformavit eandem ad reparationem suam tanto ferventius nos inducit quanto eiusdem apostoli preclaris meritis convenit amplius ut ad eam sollicitius intendatur quantoque ipsius structum basilice multis antiqua temporibus nove reparationis beneficia etiam alias noscitur indigere [...]. [Avinioni nonis iulii anno decimo].

On 1 July 1351, Clement VI gave authority for transporting the timber needed to repair the basilicas of S. Pietro and S. Paolo fuori le Mura (Archivio Segreto Vaticano, *Registra Vaticana*, vol.145, fol.53r.):

"Since our venerable brother Ponzio, bishop of Orvieto and our vicar in Rome for spiritual matters, has made arrangements for finding, transporting and delivering a certain quantity of timber from Calabria and other places by certain merchants, for repairs to the basilicas of S. Pietro and S. Paolo in Rome, we request your community [...]"

Cum venerabilis frater noster Poncius episcopus Urbevetanensis noster in spiritualibus in urbe vicarius certam quantitatem lignaminum de Calabria et certis aliis partibus pro reparatione beatorum Petri et Pauli Basilicarum de urbe per certos mercatores haberi deferri et conduci ordinaverit ad Basilicas memoratas universitatem vostram rogamus [...].

Matteo Villani's *Cronaca* (I, pp.86-7) also records damage to the Torre delle Milizie and the Torre dei Conti:

"On the earthquakes which occurred in Italy.

In this year [1349], on 10 September, extraordinary and amazing earthquakes began in Italy, and in many parts of the world they lasted for a number of days, and in Rome they caused the collapse of the bell-tower of the great church of S. Paolo, as well as part of the church loggia, and part of the noble Torre delle Milizie and the Torre del Conte, leaving a reminder of its disastrous effect in many other parts of Rome.

Di tremuoti furono in Italia.

In questo anno, a dì X di settembre, si cominciarono in Italia tremuoti disusati e

maravigliosi, i quali i[n] molte parti del mondo durarono più di, e a Roma feciono cadere il campanile della chiesa grande di San Paolo, con parte delle loggi di quella chiesa, e una parte della nobile torre delle Milizie, e la torre del Conte, lasciando i[n] molte altri parti di Roma memoria delle sue rovine.

The contemporary *Chronicon Mutinense* by Giovanni da Bazzano (p.147) dates the earthquake to 1 September, and records further details about the basilica of S.Paolo: "In the said year [1349], on 1 September, almost at the second hour and before the third, the world was struck by an earthquake which was stronger in the East than in the West; [...] In Rome, indeed, a marble column supporting the church of S.Paolo collapsed, together with about a third of the church loggia, and many more churches and other buildings in the city collapsed in an amazing way".

Dicto millesimo primo septembris quasi in hora secunda et ante terciam fuit terraemotus in orbe, scilicet fortior fuit in partibus Orientis quam Occidentis: [...] In Urbe vero cecidit quaedam colupna de marmore quae sustinebat ecclesiam Sancti Pauli cum tertia parte vel circa cooperti ipsius ecclesiae et multae aliae ecclesiae ibi et edificia mirabiliter ceciderunt.

The humanist and poet Francesco Petrarca records this earthquake in three letters, dating to 1351, 1353 and 1368.

The first of these is to Luigi Santo di Campinia (*ad Socratem*), and was written at Piacenza on 11 June 1351 (*Familiarum Rerum*, 11, 7, vol.11, p.338):

"To his Socrates, the earthquake at the city of Rome and the sad omen to be derived from it. [...] here is something you perhaps do not know: that Rome has been more seriously shaken by an unusual earthquake than at any time since its foundation more than two thousand years ago. Ancient buildings which were neglected by the local people but admired by pilgrims, collapsed; that unique tower called the 'tower of the count' has been split open with great cracks, and now, in its mutilation, sees its own head, the pride of its noble summit, lying scattered on the ground; furthermore, lest evidence of heavenly wrath should be lacking, a considerable part of many

fig. 91 Rome, the column of Marcus Aurelius, also known as the Antonine column (2nd century A.D.). Adjacent drums (cylindrical stone blocks) slipped, very probably as a result of seismic effects. These effects may well have been those of the 1349 earthquake, one of the most serious in Rome before the second half of the 16th century, when the column was restored. Drawings and written evidence in fact show that this movement of the drums (now fairly well concealed but still visible) was very obvious, and the work of 16th century restorers, which is described in detail in the site account book, included repairs and restoring the displaced drums to their original position (Martines 1983).



churches, and especially that dedicated to the apostle Paul, has collapsed, and the top of the Lateran church has fallen, all of which throws a pall of cold gloom over the joy of the Jubilee [...]. On the third day before the Ides of June [11 June], at Piacenza”.

Ad Socratem suum, terremotus urbis Rome et mestum inde presagium. [...] ecce, quod adhuc forsitan ignoras, Roma ipsa insolito tremore concussa est tam graviter ut ab eadem urbe condita, supra duo annorum milia, tale ibi nichil acciderit. Cecidit edificiorum veterum neglecta civibus stupenda peregrinis moles; turris illa toto orbe unica que Comitibus dicebatur, ingentibus rimis laxata dissiluit et nunc velut trunca caput, superbi verticis honorem, solo effusum despicit; denique ut ire celestis argumenta non desint, multorum species templorum, atque in promissis Paulo Apostolo dicata edis bona pars humi collapsa et Lateranensis ecclesie deiectus apex, Iubilei ardorem gelido horrore contristant; [...] III Idus Iunias, Placentie.

The second letter is addressed to Angelo di Pietro Stefano dei Tosetti (*ad Lelium*), and was written in 1353 (*Familiarum Rerum*, 15, 9, vol.12, p.162):

“To the same Lelio [...] This is the fourth year [1353] since the church of the apostle Paul was almost completely destroyed in a terrible earthquake, and the church of the Virgin which stands on top of a hill [Ara coeli] was badly shaken; surely no-one could claim that earthquakes are not as clear a sign of divine wrath as lightning [...]”.

Ad eundem Lelium [...] Quartus annus agitur ex quo terremotu terribili et apostoli Pauli templum pene funditus ruit et Virginis domus supremo colle consistens graviter concussa est; nisi forte dicat quispiam non tam clarum celestis iracundie indicium terremotum esse quam fulmen [...] [1353].

The third letter, addressed to Guido Sette, archbishop of Genova, was written in Venice in 1368 (*Rerum Senilium Libri*, 15, 2, pp.962-3):

“In the next year [1349], there was an earthquake in Rome (and towers and churches collapsed as a result) and it extended as far as nearby Etruria, as I recall having written to my Socrates [Venice 1368]”.

Qui hunc proxime secutus est anno, Roma tremuit usque ad ruinam turrium ac templorum; simul et partes Etrurie tremuerunt, de quo tunc sollicitus ad Socratem nostrum scripsi.

In the contemporary chronicle of Henricus Surdus de Selbach (p.99), who was chancellor at the bishopric of Eichstatt, there is a reference to the basilica of the Dodici Apostoli, not mentioned in any other source of the time:

“In the same month [September 1349], on the feast of the Blessed Gorgonius [9 September], both in the city of Rome and its surroundings and in the kingdom of Apulia, there was a very great earthquake, even greater than that of the previous year in Germany.

It caused so much of the church of S.Paolo in Laterano to collapse that barely a third was left. The basilica of the Dodici Apostoli, towers and many other buildings in Rome were destroyed, [...] And the Romans were so terror-stricken by this that they would not live in their houses, but slept in tents and buildings away from their homes”.

Eodem mense ac in die beati Gorgonii in urbe Romana et locis vicinis ac in regno Apulie maximus terre motus fuit, eciam maior quam de quo supra anno precedenti in Almania. Unde ex hoc ecclesia sancti Pauli in Laterano corruit, ita quod vix tertia pars eiusdem remansit. Basilica XII apostolorum, turres et multa alia edificia in Urbe corruerunt [...] Et ex eo territi Romani non audebant inhabitare domos suas, set in tentoriis et extra domorum tecta dormiebant.

Tarano (province of Rieti)

The castle partially collapsed. Two months after the earthquake, pope Clement VI allocated 400 gold florins for repair work.

Our source is an order dated 13 November 1349 in which Clement VI ordered his treasurer to allocate the necessary funds for repairs (Archivio Segreto Vaticano, *Registra Vaticana*, vol.143, fol.101):

"To our beloved son who is treasurer of the Patrimony of St.Peter in *Tuscia* on our behalf and that of the Roman Church. A trustworthy report has informed us that part of the castle of Tarano has collapsed [...] in an earthquake which violently shook that area, and that the castle of Tarano can be suitably repaired at a cost of three hundred [gold florins]. [...] Given at Avignon on the Ides of November [13 November 1349] in the eighth year [of the pontificate of Clement VI]".

Dilecto filio thesaurario Patrimoni beati Petri in Tuscia pro nobis et ecclesia Romana. Ad audienciam nostram insinuacio fidedigna perduxit quod roche Tarani in parte [...] propter terremotum qui partes illas graviter conquassit quodque rocha Tarani pro trecentis [...] possent commode reparari. [...] Datum Avinioni idibus novembris anno octavo.

Ascoli Piceno

Giovanni da Bazzano was a notary from Modena who wrote at the time of the earthquakes, but he was a long way from the major effects areas. He records very serious damage to towers and other buildings at Ascoli Piceno. In view of that fact, and because Ascoli Piceno is fairly distant from the major effects areas, it seems appropriate to re-evaluate the picture of effects described by Giovanni da Bazzano for that town. In any case, his text pays no particular attention to Ascoli, simply attributing very serious damage to three towns (L'Aquila, Perugia and Ascoli Piceno) which were far from where he was living.

He wrote as follows (p.147):

"In the said year [1349], on 1 September, almost at the second hour and before the third, the world was struck by an earthquake [...] In Apulia and those parts, several towns collapsed with most of their buildings, and the towns of L'Aquila and Ascoli and that of Perugia, too, were damaged in the said earthquake, for many towers and other buildings collapsed there".

Dicto millesimo primo septembris quasi in hora secunda et ante terciam fuit terraemotus in orbe, scilicet fortior fuit in partibus Orientis quam Occidentis: [...] In Apulea [et] in partibus illis plures terrae et edificia ibi existentes pro parte maxima corruerunt, ut civitas Aquilae, civitas Esculana et etiam civitas Perusina [propter] dictum terraemotum cum damno quia ibi multae turres et edificia corruerunt.

There are two passages in the *Cronaca ascolana dal 1345 al 1523* (pp.4, 8) which record the earthquake. In the second, we have corrected the date 1352 to 1349, because 9 September was a Wednesday in that year:

"In the year of Our Lord 1349, on 9 of the said month of September, there was a very great earthquake, [...] and later on in that year, there were such very great earthquakes that bells rang of their own accord".

"In the year of Our Lord 1352 [1349], on Wednesday 9 September, a little before half way through the third hour, there was so great an earthquake that the bell in the *palazzo* in the main square rang of its own accord and so did many other bells in the town [of Ascoli] because of the tremendous shaking of the towers; and many buildings and towns were reduced to ruins".

Anno Domini 1349, die nono dicti mensis septembris, fuit terremotus maximus, [...] et post de dicto anno maximi terremotus fuere adeo ut campane ex semetipsis pulsarent. [...] Anno Domini 1352, die mercuri et nona mensis septembris, parum ante horam medie

tertie, fuit tam maximus terremotus, quod campana palatii de platea superiori per se sonavit et multe alie per civitatem propter maximam turrium concussionem et multa edificia et urbes ruinate sunt.

AREA ③ **Sulmona** (province of L'Aquila)

There was severe earthquake damage. The town walls collapsed and the church of the convent of S.Domenico was badly damaged. An annual subsidy of 12 *unciae* was granted towards the work of reconstruction. In 1354, the commune of Sulmona was granted a tax exemption privilege.

There are some documents in the Archivio di Stato at L'Aquila (Sezione di Sulmona, *Opera pia Casa Santa dell'Annunziata*, no.242) — especially wills — which mention legacies for rebuilding or restoring ecclesiastical buildings in the town. These legacies were made not only for private buildings, but also for numerous church buildings: S.Maria Annunziata, S.Panfilo, S.Francesco, S.Domenico, S.Croce, S.Maria de Tumba, S.Agostino; and S.Andrea. There are also two legacies for repairs to bridges near Sulmona and to a mill at Mola dei Martelli. But the damage mentioned is never explicitly related to 1349 earthquake effects.

The sources consist of a verse autobiography by the Sulmona poet Giovanni Quatrario, and two documents from the Angevin chancery dated 1354 and 1382.

At the time of the earthquake, Giovanni Quatrario was living in the town with his family, so his evidence is based on personal experience (ed. Pansa 1912, pp.305-6):

“Sulmona is lying in a heap of rubble, overlaid with tall clouds of dust. Shouts are heard, and the ground is about to be swallowed up. With difficulty we make our way out of doors and amid dark clouds of dust we seek a way through the ruins of houses. In the wretched darkness of these clouds you count your children; you are distraught to find some of your beautiful daughters missing. You seek calm as the earth trembles, but you cannot find any, and you seem to be cast down towards the waters of Styx. While all around the encircling town walls shake and collapse, the terror-stricken crowd wanders through open spaces. You look towards the spot where your home is normally to be seen, and you see it reduced to a pile of stones, rubble and broken beams. Then your strength of mind is weighed down by these disasters and prostrated by so many troubles, so that it is almost overcome and cries out in lamentation. You cried out about that spot, that hole which was perhaps the tomb of your dying daughter, and you peered into dark corners as you searched, calling out or falling silent as you listened in case some faint cry reached you in reply”.

Obruta Sulmo iacet. nebulis contextitur altis. / Exoritur stridor. terra subire parat. / Exilimus timidi. spatio pellente neblaque / Nubiferas. versas cernimus ante domos. / Pulverulenta tuos numeras ingloria natos. / Obruta de numero filia pulera vacat; / Accessi dum terra tremit reperire quietem / Nescit. et in Stigios credimus ire lacus; / Dum circum cadidant concussis menia limbis. / In vacuum volitat territa turba locum; / Prospicis unde domus solita est se ostendere. versa / In calcem et lapides. tignaue rupta coit; / Tunc virtus onerata malis. tantisque procellis / Obruta. mugitus dat prope victa suos; / Clamabas si forte locus. si forte caverna / Seminecem natam conderet ulla tuam; / Inque caput latebras infora, clamando. silendo. / Auribus an aliquid murmur habere queas.

On 4 March 1354, Louis and Joanna I of Anjou issued a privilege in Naples in favour of the town of Sulmona (in Faraglia 1888, pp.212-3):

“In view of the fact that your aforesaid fellow citizens have been troubled by earthquake damage and many deaths in the past, as well as by the subsequent turbulence of the said war [...]. Given in Naples in our Chamber in the year of Our Lord 1354, on 4 March, in the seventh indiction, in the sixth year of our reigns and the twelfth year of our queen”.

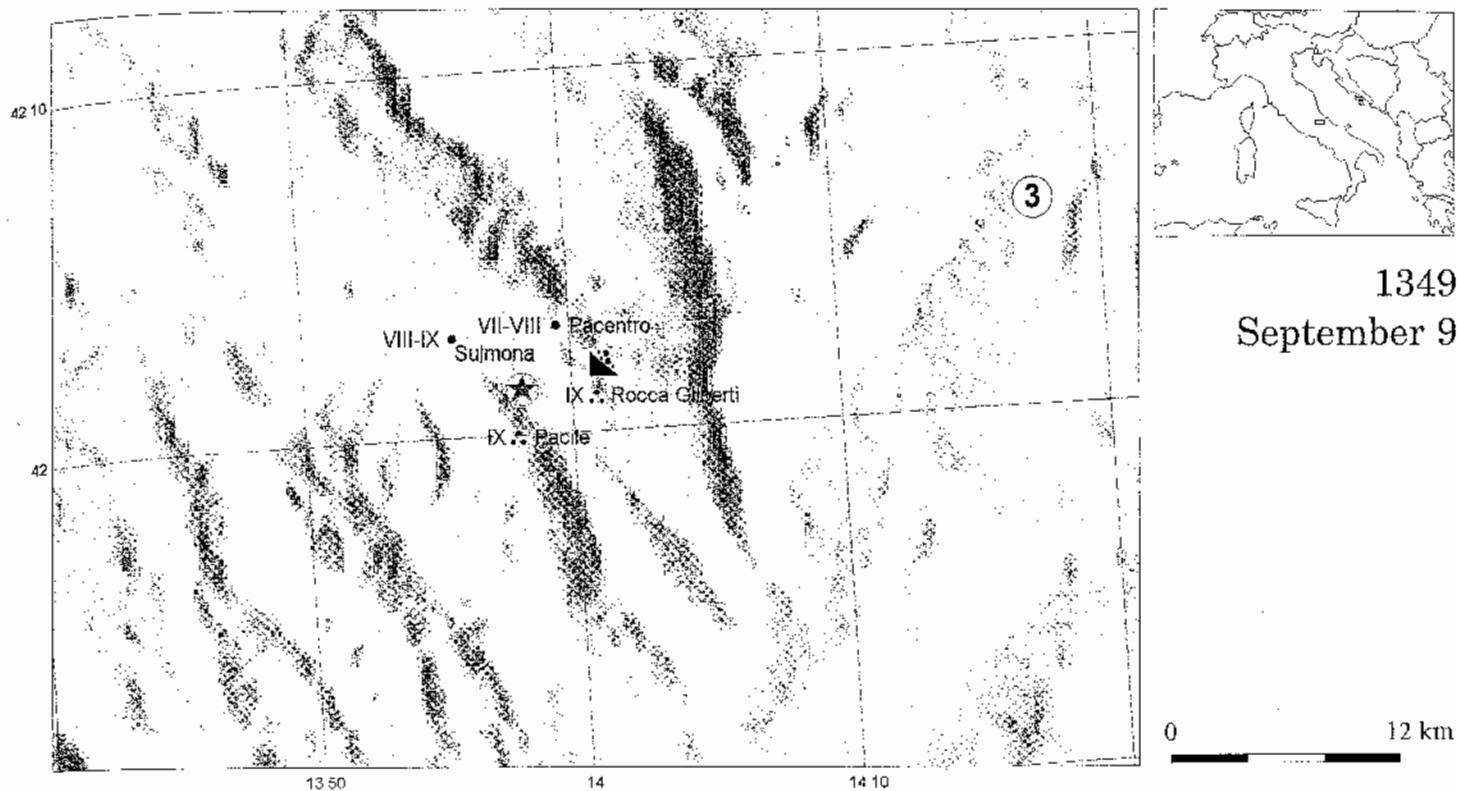


fig. 92

Pro relevamine quoque vestrum prefatorum hominum gravatorum tum ex invalentia Terremotus, tum ex mortalitate preteriti temporis imminente, tum etiam ex subsequuto fremitu guerre predictae [...].

Datum Neapoli in Camera nostra Anno Dominj Millesimo Trecentesimo quinquagesimo quarto die quarto Martij septime Ind. Regnorum nostri Regio Anno sexto, nostri vero Regine anno duodecimo.

In a diploma dated 31 December 1382, king Charles III of Durazzo confirmed the privileges previously granted by Louis and Joanna I of Anjou to the Franciscan friars of Sulmona for the restoration of the convent church, which had been destroyed in the earthquake, establishing an annual grant of twelve *unciae* (in Faraglia 1888, p.208).

Pacentro (province of L'Aquila)

There was damage to the churches of S. Antonio and S. Marcello and to the spring at Pacentro castle. These effects are recorded in a will dated 3 July 1362 now in the Archivio di Stato at Sulmona (*Opera pia Casa Santa dell'Annunziata*, no.242, cass.II, doc.329), but the document does not specify the cause of the damage, so its relationship to the 1349 earthquake is hypothetical.

Pacile and Rocca Gilberti (province of L'Aquila)

That the earthquakes of 1349 had destructive effects at these two places, both of which are now abandoned, was suggested by the local historian Mattiocco (1978). This suggestion is based on substantial documentary evidence, and we are inclined to accept it, though the primary sources do not refer to these two localities explicitly.

The ruins of Pacile can be made out to the south of Colle Mitra, between the territory of Cansano and that of Pettorano.

Rocca Gilberti was situated on the slopes of La Maiella, along the old road from Pacentro to Campo di Giove. Little of the village remains, and Mattiocco (1978) thinks it was swept away in a landslide, probably started by the earthquake.

AREA ④ **Atina** (province of Frosinone)

Atina was completely destroyed and there were a great many victims.

Our source is the contemporary *Chronicon breve Atinensis ecclesiae* (col.910):

"In the year of Our Lord 1349, on 9 September, there was a great and terrible earthquake, with the result that no stone was left upon another, and it killed men and women in great numbers".

Anno Domini MCCCXLIX nono septemb. fuit magnus et terribilis terraemotus, ita ut non remanserit lapis super lapidem, et percussit viros et mulieres sine numero.

Venafro (province of Isernia)

There is evidence of widespread destruction in the inhabited area, with almost 700 victims. The ancient cathedral collapsed in the earthquake and was rebuilt by Abbot Antonio Savina in 1423.

The sources for the earthquake are a contemporary document from the *Archivio Capitolare* at Isernia and a notarial deed of 1423.

The contemporary document is reproduced in its entirety in the work of the scholar Ciarlanti (1644, p.398):

"On 9 September in the said year [1349], the day following the feast of the Nativity of the glorious Virgin Mary, there was so great and hugely powerful an earthquake half way through the third hour that no-one has recorded a similar since the time of the Creation. [...] In particular, it completely destroyed the town of Venafro, and everywhere else around, and almost seven hundred people were killed in it [...]".

Die vero 9. mensis septembris anni predicti sequenti post festum gloriosae nativitatis S.Mariae in hora mediae tertiae terremotus tam magnus, et tam ingentissimae potentiae, quod nemo recordatur similem terremotum a tempore creationis. [...] Insuper destruxit Civitatem Venafri totaliter, et per totum, in qua mortui fuerunt fere homines septingenti [...].

The notarial deed of 1423 is recorded in an 18th century text, namely the *Storia della città di Venafro* by L.Valla (Biblioteca Nazionale, Naples, *Manuscripts*, X.C.77, fol.80):

"For this purpose [we declare] that the principal church of Venafro and the said chapel were reduced to ruins and completely destroyed in the earthquake, and that Abbot Antonio Savina, their father [i.e. of those who claimed *jus patronati*], rebuilt the foundations of the chapel and the whole dome [...]".

Pro eo quod dicta major ecclesia Venafra et dicta Cappella tempore Magni terremotus passa fuit ruinam, et ruinata fuit usque ad fundamentum, et quondam Abbas Antonius Savina eorum pater fundamenta ipsius cappellae, et totam cupulam reaedificavit [...].

Isernia

The earthquake of 9 September was preceded by a strong earthquake during the night of 22 January 1349, but no damage is recorded on that occasion. From that night onwards, there was an almost uninterrupted series of weak shocks nearly every month until 8 September. Our source is a contemporary memory from the *Archivio Capitolare* at Isernia (in Viti 1972, p.384):

"In the year 1349, in the month of January, during the night of the feast of St.Vincent [22 January], there was a very great earthquake after dinner, and from that night onwards there was an almost uninterrupted series of weak shocks nearly every month until the feast of the Nativity of the glorious Virgin Mary [8 September]".

Anno Domini 1349. de Mense Ianuarij in nocte S.Vincentij post cenam fuit unus terremotus multum magnum, et ab illa fere continue fuerunt quasi omni mense terremotus parvi usque ad Festum Nativitatis gloriosae Virginis Mariae.

As a result of the earthquakes of 9 September, most buildings, including the cathedral, were destroyed or seriously damaged, as the document referred to above tells us at a later stage:

"On 9 September in the said year, on the day after the feast of the Nativity of the glorious Virgin Mary there was so great and hugely powerful an earthquake half way through the third hour that no-one has recorded a similar since the time of the Creation. It destroyed and brought down the principal church of Isernia, the house of Signor Andrea, that of Signor Alferio, and generally speaking all the buildings in the town of Isernia from the smallest to the largest, so that there was no building left which was not completely destroyed or badly damaged".

Die vero 9. mensis septembris anni praedicti sequenti post festum à gloriosae nativitatis S.Mariae in hora mediae tertie terremotus tam magnus, et tam ingentissimae potentiae, quod nemo recordatur similem terremotum à tempore creationis. Diruit, et subvertit Ecclesiam Iserniensem, domus Domini Andreae, Domini Alferij, et generaliter omnia aedificia Civitatis Iserniae a minori usque ad maius; itaque nullum omnino remansit, vel quod non esset totaliter destructum, vel pro maiori parte dirutum.

San Domenico (province of Frosinone)

The monastery was completely destroyed. In 1350 Clement VI granted an indulgence to those offering alms for its reconstruction. Our source is a letter dated 1 April 1350 from pope Clement VI granting an indulgence of 100 days to those who contributed to the repair work (Archivio Segreto Vaticano, *Registra Vaticana*, vol.198, fol.157v.):

"To all the faithful in Christ [...] since we have been informed by the abbot and the Cistercian monastery of Casamari, in the diocese of Veroli, that its subject priory of S.Domenico Eremita in the diocese of Sora, in which the remains of the said saint rest, has been completely destroyed in the earthquake which struck that area this year [...], we grant 100 days' indulgence to all those who repent and contribute to its repair [...] Given at Avignon on the Calends of April [1 April 1350], in the eighth year [of the pontificate of Clement VI]".

Universis Christi fidelibus [...] sane pro parte dilectorum filiorum [...] abbatis et conventus monasterii Cesemari cystericiensis ordinis, Verulane dyocesis, nobis extitit intimatum quod prioratus conventualis Sancti Dominii heremite eidem monasterio immediate subiectus dicti ordinis, Sorane dyocesis, in quo ipsius sancti corpus venerabile requiescit, adeo propter terremotum, qui de presenti anno fuit in illis partibus, est destructus funditus et eversus [...] Nos itaque [...] omnibus vere penitentibus et confessis, qui ad hoc manus porrexit adiutore, centum dies de iniunctis eis penitentiis relaxamus [...] Datum Avinioni kalendas aprilis anno octavo.

San Vincenzo al Volturno (province of Isernia)

The abbey and church were seriously damaged, and two monks were killed.

Our source is a contemporary memory from the Archivio Capitolare at Isernia, which is edited in Viti (1972, p.384):

"On 9 September in the said year [1349], the day following the feast of the Nativity of the glorious Virgin Mary, there was so great and hugely powerful an earthquake half way through the third hour that no-one has recorded a similar since the time of the Creation. [...] It nonetheless destroyed the whole province of Comino [...], the church of S.Vincenzo al Volturno, the monastery, and all the fortified villages belonging to the above-mentioned church, where venerable monks who were blood brothers of the abbot of the said monastery were killed".

Die vero 9. mensis septembris anni praedicti sequenti post festum à gloriosae nativitatís S. Mariae in hora mediae tertie terremotus tam magnus, et tam ingentissimae potentiae, quod nemo recordatur similem terremotum à tempore creationis. [...] Destruxit nihilominus totam Provinciam cominus [...] Ecclesiam S. Vincentij de Volturno, Monasterium, et omnia Castra Ecclesiae supradictae, in quibus mortui fuerunt venerabiles Monachi frates carnales Abbatís Monasterii praelibati.

Alvito (province of Frosinone)

The castle walls were in poor condition from old age, and the earthquake knocked them down. The castle was rebuilt in 1350 by the Cantelmo family, with an appreciable enlargement of the village.

Our source is a contemporary inscription on the castle gate at Alvito:

"During an earthquake and general danger in various parts of the kingdom, these walls [of Alvito castle], being old, completely collapsed in ruins. However, the nobleman Rostaino Cantelmo restored and improved them in the illustrious name of his ancient ancestors, and he built a new castle and new walls [...]. The king and queen gave this castle to him for his great merits, it being vacant at that time, through the death of Adenolfo. If you seek to know when, you will apply the date 1350, when the Jubilee opened its gates to all Christians. If you wish to know who carried out the work, his name is Landolfo".

Dum tremor in terris fuit, et generale periculum per varias Regni partes, haec moenia prorsus sunt aequata solo, dederunt annosa ruinam. Rostainus tamen in melius vir nobilis ille Cantelmus egregio priscorum nomine patrum restituit, castrumque novum, nova moenia fecit [...]. Huic pro tot meritis Rex et Regina dederunt hoc castrum, quod tunc Adenulfi morte vacabat. Tempora si quaeris, millenos atque tricenos quinquaginta dabis, coeli dum libera cunctis ostia Christicoelis annus Iubilaeus habebat. Si petis artificem, Landulfus sit tibi nomen.

Cardito (province of Frosinone) and **Cerasuolo** (province of Isernia)

Both their fortresses were destroyed.

Our source is a contemporary document from the Archivio Capitolare at Isernia, which is reproduced in its entirety in Viti (1972, p.384):

"On 9 September in the said year [1349], the day following the feast of the Nativity of the glorious Virgin Mary, there was so great and hugely powerful an earthquake half way through the third hour that no-one has recorded a similar since the time of the Creation. [...] It nevertheless destroyed the whole Comino province, the fortresses of Cardito and Cerasuolo[...]"

Die vero 9. mensis septembris anni praedicti sequenti post festum à gloriosae nativitatís S. Mariae in hora mediae tertie terremotus tam magnus, et tam ingentissimae potentiae, quod nemo recordatur similem terremotum à tempore creationis. [...] Destruxit nihilominus totam Provinciam cominus, Fortilitia Cardeti, Cerasoli [...].

Cassino [formerly San Germano] (province of Frosinone)

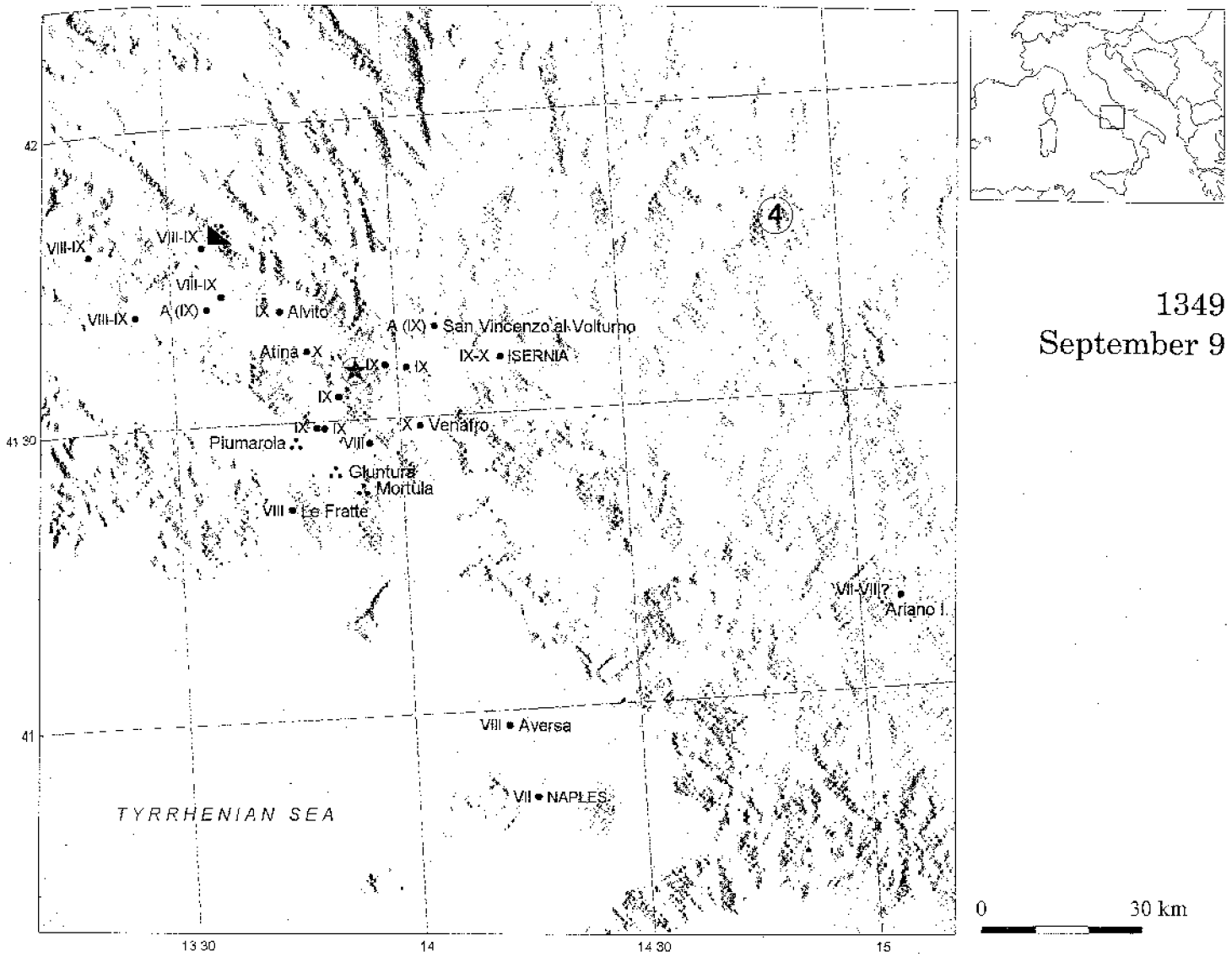
Half the town collapsed. Particularly affected were the areas in the plain or towards the marshes. There were nearly a thousand victims.

Contemporary sources consist of two chronicles, a note in the margin of a codex, and a document from the archivio capitolare at Isernia.

The contemporary *Cronaca* by Matteo Villani (I, pp.86-7) records:

"On the earthquakes which occurred in Italy.

In this year [1349], on 10 September, extraordinary and amazing earthquakes began in Italy, and in many parts of the world they lasted for a number of days [...] At San Germano and Montecassino it caused incredible damage to large buildings, to the



1349
September 9

fig. 93

ancient monastery of S. Benedetto on the mountain, and it knocked down a good part of the hill itself, which appears to be of solid rock”.

Di tremuoti furono in Italia.

In questo anno, a dì X di settembre, si cominciarono in Italia tremuoti disusati e maravigliosi, i quali in molte parti del mondo durarono più di, [...] A San Germano e a Montecasino fece incredibili ruine di grandi edifici, e dello antico monistero di san Benedetto sopra il monte e del poggio medesimo, che pare tutto sasso, abbatté buona parte.

A contemporary memory from the Archivio Capitolare at Isernia, which is reproduced in its entirety in Viti (1972, p.384) records:

“On 9 September in the said year [1349], the day following the feast of the Nativity of the glorious Virgin Mary, there was so great and hugely powerful an earthquake half way through the third hour that no-one has recorded a similar since the time of the Creation. [...] It also destroyed and reduced to ruins the monastery at Cassino and the whole town of S. Germano, where almost a thousand people were killed, and it destroyed other villages belonging to the said monastery”.

Die vero 9. mensis septembris anni praedicti sequenti post festum à gloriosae nativitatis S.Mariae in hora mediae tertie terremotus tam magnus, et tam ingentissimae potentiae, quod nemo recordatur similem terremotum à tempore creationis. [...] Destruxit praterea, et subvertit Monasterium Cassinense cum tota Terra S.Germani, in qua mortui fuerunt homines fere mille, destruxit alias Terras Monasterii supradicti.

In an appendix to the year 1349 in Muratori's edition of the chronicle of the *Anonymus Monachus Casinensis* (p.75), we read:

"On 9 September in the year of Our Lord 1349, in the third indiction, there was a great earthquake throughout the kingdom of Sicily, such as there had never been since the world began, except at the death of Christ [...] It happened when mass was being celebrated. [...].

So half the town of San Germano collapsed, especially the part in the plain or in the marshy area, and countless men and women were killed there".

Anno domini 1349 tertia indictione die nono septembris, fuit magnus terramotus in toto Regno Siciliae, qualis non fuit ab initio mundi, nisi in morte Christi [...] Id fuit hora missae. [...].

Civitas ergo sancti Germani media corruit, praecipue illa pars, quae erat in plano, seu paludibus, et in ea innumera multitudo hominum ac mulierum mortua est.

A contemporary note in the margin of a Cassino codex containing the *Regula S.Benedicti*, published in Caravita (1870, vol.2, pp.123-4), records:

"In the year of Our Lord 1349, in the third indiction, on 9 September, there was a great earthquake throughout the kingdom of Sicily, such as had not occurred since the world began, except at the death of Christ [...]. Half the town of San Germano collapsed as well, especially the part in the plain or in the marshes, and a very large number of men, women, children and monks were killed".

Anno domini M.CCC.XLVIII. III. Indictionis. die nono Septembris fuit magnus terremotus in toto Regno sicilie qualis non fuit ab initio mundi nisi in morte christi [...]. Civitas quoque Sancti Germani media corruit precipue illa pars que erat in plano seu paludibus et innumera multitudo hominum et mulierum et parvulorum et religiosorum mortua est.

Montecassino - Abbey (province of Frosinone)

The earthquake reduced the church to ruins and severely damaged the monastery and adjoining buildings. A number of the clergy and congregation who had gathered for a church service were killed. Recent studies have identified damage to the upper parts of the basilica, including the collapse of the naves, whereas the outer walls remained standing.

The popes made provisions to facilitate reconstruction. In 1353, Innocent VI granted an indulgence of 5 years and 200 days in exchange for contributions to reconstruction; and in 1354 he asked the king of Sicily to grant the diocese tax exemption. The earthquake damage, together with the effects of war, so impoverished the diocesan territory that in 1361 it was unable to pay its tithes. In 1363, Urban V granted another indulgence in exchange for contributions to the monastery. In a petition of 1365, the church, cloister and refectory are described as still in need of repair, and in the same year Urban V wrote a letter to the bishop of Bojano, ordering the income from episcopal property to be used to pay for restoration work. In 1370, Urban V ordered the abbot of the monastery to devote one sixtieth of all the monastery's income to complete repair work on the church and monastery. And as late as 1371, the bishop of Palestrina was urging the archbishop of Nicosia to take steps to collect the income which had been allocated the previous year.

Montecassino is one of the best documented places affected by the earthquake, for we have a number of contemporary narrative sources in the form of chronicles and notes in the margin of codices, as well as letters from popes Innocent VI and Urban V, and petitions and orders issued by bishops over a period as long as that from 1353 to 1371. In a letter dated 21 April 1353, pope Innocent VI granted an indulgence of 5 years and 200 days to those who contributed to the restoration of the Montecassino church (Archivio Segreto Vaticano, *Registra Vaticana*, vol.222, fol.341r.):

"To all the faithful in Christ [...] since we have learned that the church of Montecassino has been largely reduced to ruins by earthquakes which have severely struck that area, and its movable possessions have been stolen by invaders, enemies and local tyrants, we grant 5 years' and 200 days' indulgence to those who, with true repentance, contribute to the restoration of the said church [...].

Given at Avignon on the eleventh day before the Calends of May [21 April 1353], in the first year [of the pontificate of Innocent VI]".

Universis Christi fidelibus [...] cum itaque sicut accepimus ecclesia Casinensis propter terremotus, qui dudum in partibus illis loca non modica subverterunt, pro maiori parte subversa funditus et destructa omnibusque bonis suis mobilibus per invasores, emulos et tyrannos dictarum partium spoliata extiterit [...] omnibus vere penitentibus et confessis qui reparationem dicte ecclesie manus porrexerint adiutrices quinque annos et quinque quadragenas de iniunctis eis penitentiis misericorditer relaxamus [...]. Datum Avinionis XI kalendas maii anno primo.

In a letter dated 5 May 1354 and written at Villeneuve (Avignon), Innocent VI asked king Louis of Sicily to grant tax exemption to the church at Montecassino (Archivio Segreto Vaticano, *Registra Vaticana*, vol.236, fol.90):

"[...] because it is clear that the church has been reduced to ruins by the disturbance and shaking of the earthquake and hence has the greater need of your help and that of the other princes [...]."

[...] quanto ecclesia ipse terremotibus fatigata et conquassata ruinis tuo et aliorum principum auxilio noscitur amplius indigere [...].

In a letter dated 28 May 1363 and written at Avignon, pope Urban V granted an indulgence to those who contributed to the completion of restoration work at the church of Montecassino (in Leccisotti 1952, doc. no.3, pp.54-5):

"Since, therefore [...] her church at Cassino [...] has been completely demolished and destroyed by old age and earthquakes, and since the very expensive repairs are already in progress but cannot be completed without the help of the faithful, it is our wish that these repairs, under the patronage of God, should be successfully completed".

Cum itaque [...] sua ecclesia Casinensis [...] propter ipsius vetustatem et terremotus totaliter dirupta et destructa existat eiusque reparatio iam inchoata opere non modico sumptuoso sine fidelium auxilio perfici et consummari non possit, nos cupientes quod reparatio ipsa, auctore Domino, feliciter consumetur.

A petition to pope Urban V, dated 5 June 1365 and written at Benevento by Pietro Ameil, archbishop of Naples, contains information about some buildings which were still unusable (in Leccisotti 1952, doc. no.7, pp.59-60):

"Some monks of Cassino have come here to see me [...] to describe the wretched state of their church [...] the church, refectory, cloister and other places, without which monastery life can scarcely flourish or be observed, have been in such a wretched state since the time of the earthquake".

Quidam monachi Cassinenses venerunt hic ad me [...] exponentes miserabilem statum Ecclesie sue [...] ecclesia, refectorium, claustrum et alia, sine quibus male viget et

observatur vita claustralis, sunt in tam miserabili statu a tempore terre motus.

In a letter dated 23 September 1365 and written at Avignon, pope Urban V informed the bishop of Bojano that he had decided to devote the entire income and revenue of the diocese to the reconstruction of the church at Montecassino (in Leccisotti 1952, doc. no.8, p.67).

In a tithes account for the years 1358-1360 relating to the diocese of Montecassino, it is stated that the sums due could not be obtained because of the earthquake and numerous other accompanying disasters (in Inguarez *et al.* 1942, pp.54-5).

In a letter dated 10 May 1370 and written at Montefiascone to the abbot of Montecassino, pope Urban V ordered that, for two years, one sixtieth of the income of the Benedictine institutions should be spent on the reconstruction of the church and monastery (in Gattula 1733, pp.520-2):

"[...] twenty years have already gone by since the church itself and the whole monastery collapsed in ruins in an earthquake [...] Therefore we [...] thinking it unworthy that so famous a monastery [...] should remain in a state of destruction and desolation [...] are arranging for some assistance towards repairing the church and monastery and restoring them to their original state, and at the same time restoring the number of observant monks to one hundred [...]"

[...] ipsa quoque ecclesia, et totum idem monasterium, jam viginti annis decursis ex terremotus concussione casu miserabili corruerunt [...] Nos igitur [...] merito reputantes indignum, quod tam celebre monasterium [...] sic dirutum, et desolatum [...] remaneat [...] prefatam ecclesiam, et monasterium super suis fundamentis, [...] aliqui auxilio providimus in statum pristinum reparanda, et reintegrandum ibidem numerum centum Monachorum observatorum [...].

An order dated 1 October 1371 and issued at Avignon by the bishop of Palestrina, requested the archbishop of Nicosia to undertake to collect funds as previously established by pope Urban V for the restoration of the church at Montecassino (in Gattula, 1733, vol.2, p.522):

"It follows from this that, since our holy father and lord Gregory XI observed that for lack of these funds the above-mentioned repairs are subject to considerable delay, and that this leads us to fear even greater problems for the future of the monastery and the remaining buildings if a remedy is not rapidly found [...]"

Hinc est, quod Sanctissimus pater, et dominus noster dominus Gregorius divina providencia Papa XI attendes, quod ex defectu dictae sexagesimae dicta reparatio non modicum retardatur, ex quo ruina monasterii, et edificiorum quae inibi remaserunt, proth dolor! majior secutura timetur, nisi celeriter occurratur [...].

Unlike the other Cassino sources, Matteo Villani's *Cronaca* (I, pp.86-7), dates the earthquake to 10 September:

"On the earthquakes which occurred in Italy.

In this year [1349], on 10 September, extraordinary and amazing earthquakes began in Italy, and in many parts of the world they lasted for a number of days [...] at Montecassino it caused incredible damage to large buildings, and it knocked down a considerable part of the ancient monastery of S.Benedetto on the mountain, and of the hill itself, which is apparently made of solid rock".

Di tremuoti furono in Italia.

In questo anno, a dì X di settembre, si cominciarono in Italia tremuoti disusati e maravigliosi, i quali in molte parti del mondo durarono più di [...]

[...] a Montecassino fece incredibili ruine di grandi edifici, e dello antico monistero di san Benedetto sopra il monte e del poggio medesimo, che pare tutto sasso, abatté buona parte.

An appendix to the year 1349 in Muratori's edition of the chronicle compiled by the *Anonymus Monachus Casinensis* of the abbey, records:

"On 9 September in the year of Our Lord 1349, in the third indiction, there was a great earthquake throughout the kingdom of Sicily, such as there had never been since the world began, except at the death of Christ; and it was so severe in the bishopric of Cassino that the whole monastery was reduced to ruins, and no house remained standing there, and all the monastery's fortified villages were destroyed, except for those of San Vittore and Le Fratte. It happened when mass was being celebrated. Hence many men and women and priests at the altars died in the churches, in addition to those who died in their homes, villages and towns".

Anno domini 1349 tertia indictione die nono septembris, fuit magnus terramotus in toto Regno Siciliae, qualis non fuit ab initio mundi, nisi in morte Christi, et specialiter in episcopato cassinensi, in tantum quod totum monasterium funditus corruit, et remansit in eo nulla domus erecta, et omnia castra monasterii fuerunt diruta praeter castrum Sancti Victoris, et fractarum. Id fuit hora missae. Itaque multi homines, et mulieres, et sacerdotes, et religiosi super altaria, et in ecclesiis mortui sunt, praeter eos, qui in propriis domibus castris, et civitatibus obierunt.

Two contemporary notes written in the margin of a Cassino codex containing the *Regula S. Benedicti* (published in Caravita 1870, vol.2, pp.121, 123-4), contain exactly similar texts. The following is one of them (p.121):

"In the year of Our Lord 1349, in the third indiction, on 9 September, there was a tremendous earthquake in the kingdom of Sicily, especially in the bishopric of Cassino, which entirely destroyed the Cassino monastery and all the fortified villages in that bishopric, except for San Vittore and Le Fratte, and it happened shortly after sunrise and lasted in that bishopric for several days in succession; and people slept in the fields because they were afraid".

Anno domini MCCCXLVIII. III. Indictionis die nono Septembris fuit maximus Terremotus in Regno Siciliae specialiter in episcopatu Casinensi. quod omnino destruxit Monasterium Casinese, et omnia Castra ipsius episcopatus praeter Castrum Sancti Victoris et Fractarum et fuit aliquantulum post ortum Solis, et duravit in dicto episcopatu per plures diessequentes. et gens dormiebat in campis propter timorem.

A contemporary memory from the Archivio Capitolare at Isernia which is reproduced in its entirety in Viti (1982, p.384), records:

"On 9 September in the said year [1349], the day following the feast of the Nativity of the glorious Virgin Mary, there was so great and hugely powerful an earthquake half way through the third hour that no-one has recorded a similar since the time of the Creation. [...] It also destroyed and reduced to ruins the Cassino monastery [...] it destroyed other villages belonging to the said monastery".

Die vero 9. mensis septembris anni praedicti sequenti post festum à gloriosae nativitatís S. Mariae in hora mediae tertie terremotus tam magnus, et tam ingentissimae potentiae, quod nemo recordatur similem terremotum à tempore creationis. [...] Destruxit praeterea, et subvertit Monasterium Casinense [...] destruxit alias Terras Monasterii supradicti.

Balsorano Vecchio (province of L'Aquila)

According to Matteo Villani, the castle "collapsed into the valley". This probably means, in the language of the time, that there was some surface slipping of the land on which the fortified settlement stood. A large proportion of the inhabitants were killed. Villani writes (I, pp.86-7):

"On the earthquakes which occurred in Italy. In this year [1349], on 10 September, extraordinary and amazing earthquakes began in Italy, and in many parts of the world

they lasted for a number of days [...] the castle of Balsorano on the hill collapsed into the valley, killing almost all the inhabitants”.

Di tremuoti furono in Italia. In questo anno, a dì X di settembre, si cominciarono in Italia tremuoti disusati e maravigliosi, i quali in molte parti del mondo durarono più di, [...] il castello di Valzorano del poggio rovinò nella valle, con morte quasi di tutti i suoi abitanti.

Sant'Agnello (province of Frosinone)

The convent church was badly damaged, and the chapel of S.Giacomo collapsed. In 1350, the bishop of Alatri granted an indulgence of 40 days in exchange for alms for restoration work. The source is a letter dated 3 April 1350 from the bishop of Alatri (published in Floridi 1967, pp.161-2):

“Since it is our desire that the church of Sant'Agnello in the territory of Guarcino in our diocese of Alatri, including the chapel of S.Giacomo which was destroyed in the earthquake, should be frequented by the faithful, it requires to be restored and rebuilt to a suitably high standard [...]. We grant and give authority for forty days of indulgence to be offered to all those who truly repent and confess their sins and go to the said church and chapel to offer sincere prayers and orations to God and St.James and assist the friars and hermits of the church by giving them alms. [...] given in the bishop's residence [at Alatri] in the year 1350. In the third indiction. In the eighth year of the pontificate of Clement VI. On 3 April”.

Cupientes itaque ut ecclesia Sancti Agnelli sita in territorio castri Guarcini nostre alatrine diocesis et cappella que ibidem ad laudem ad laudem et honorem beatissimi Iacobi apostoli occasione terremotus dirruta, debet, deo propitio, construi et edificari congruis honoribus ab eisdem Christi fidelibus frequententur. [...] committimus et licentiam ac auctoritatem concedimus ut omnibus et singulis vere penitentibus et confessis qui ad dictas ecclesiam et cappellam accesserint preces et orationes devote deo et ipsi apostolo effusuri ac fratribus et heremitis eiusdem ecclesie seu cappelle elemosinas erogabunt, [...] Datum et actum in domibus episcopalibus sub anno domini millesimo trecentesimo quinquagesimo. Indictione tertia. Pontificatus domini Clementis pape sexti. Anno eius octavo. Mensis aprilis, die tertia.

Sora (province of Frosinone)

There was serious damage to buildings, but no further details are supplied.

Our source is the contemporary *Cronaca* by Matteo Villani (I, pp.86-7):

“On the earthquakes which occurred in Italy. In this year [1349], on 10 September, extraordinary and amazing earthquakes began in Italy, and in many parts of the world they lasted for a number of days [...] In the town of Sora, it caused very serious damage to buildings.

Di tremuoti furono in Italia. In questo anno, a dì X di settembre, si cominciarono in Italia tremuoti disusati e maravigliosi, i quali i[n] molte parti del mondo durarono più di, [...] Nella città di Sora fece delli edifici grandissime ruine.

Veroli (province of Frosinone)

The cathedral and its bell-tower were almost completely destroyed, as were the church of S.Maria Iacobi (now S.Maria Salome), and the hospital. The church of S.Pietro was probably damaged as well. A private document of 1364 refers to a sum raised from the sale of a *casalino* and allocated for repairs to the church; but there is no specific reference to the earthquake. There are numerous documents providing evidence of reconstruction work: there are references to the sale of buildings to provide funds for rebuilding the cathedral in documents of 1352, 1356 and 1365; and indulgences were granted in 1354 to all those who contributed to the restoration of the hospital for the poor and

the church of S.Maria Iacobi. The sources consist of: four deeds of sale drawn up between 1352 and 1365 by the cathedral canons and the *rettore* of the church of S.Pietro; four letters written between 1354 and 1376 by popes Innocent VI, Urban V and Gregory XI; and a document of 1360 from the bishop of Sabina to the bishop of Veroli.

A deed of sale dated 8 October 1352 and drawn up at Veroli, provides evidence of the sale of a *casalino* by the canons of Veroli cathedral. The proceeds were to be used for repairing the cathedral (Biblioteca Apostolica Vaticana, *Sant'Erasmus di Veroli*, cart.21, *pergamena* 7):

"[...] the canons of Veroli cathedral [...] sold [...] a *casalino* [...] for twelve *librae denariorum* [...] they wished to use the proceeds to repair the said cathedral, which was reduced to ruins in the earthquake [...]. Written at Veroli in the cathedral dormitory building where services are temporarily being held [...]"

[...] canonici maioris ecclesie verulane [...] vendiderunt [...] quondam casalenum [...] [pro pretio] duodecim librarum denariorum [...] [dicti] canonici dictam pecuniam expendere vollint pro utilitate et reparatione dicte ecclesie, que per terremotus ruina erat collapsa. [...] Actum Veruli in palatio dormitorii dicte Verulane ecclesie ubi nunc divina celebrantur officia [...].

In a letter dated 26 August 1354 and written at Villeneuve (Avignon), pope Innocent VI exhorted the faithful to give alms for the reconstruction of the chapel of S.Maria Iacobi (Archivio Segreto Vaticano, *Registra Vaticana*, vol.226, fol.245v):

"[...] where, because of their devotion to the said saint, a throng of local people gathered during the very strong earthquake which caused so much damage in those parts, and the church was completely destroyed [...]"

[...] ad quam tam ob hoc, quam ob devotione que habetur ad eam magna populi confluit multitudo tempore terremotus, qui in partibus illis magna dampna intulit, totaliter diruta extiterit [...].

In another letter, also dated 26 August 1354, Innocent VI exhorted the faithful to contribute to the reconstruction of the hospital for the poor (Archivio Segreto Vaticano, *Registra Vaticana*, vol.226, fol.246r):

"[...] since we have learned that the hospital for the poor at Veroli [...] was destroyed in the very severe earthquake which caused great damage in those parts [...]"

[...] cum itaque sicut accepimus hospitale pauperum de misericordia in civitate Verulane [...] propter terremotum qui etiam in illis partibus magna dampna intulit sit dirutum [...].

By means of a deed of sale dated 8 June 1356, the canons of Veroli cathedral sold a vineyard to pay for rebuilding the cathedral bell-tower (Archivio Capitolare, Veroli, *pergamena* 307):

"[...] which collapsed in ruins because of the force of the earthquake [...]"

[...] quod propter terremotus ruinam funditus erat dirutum [...].

In a document issued at Ancona and dated 24 September 1360, the bishop of Sabina informed the bishop of Veroli that the decision to hold the number of cathedral canons at 12 had been ratified (Archivio Segreto Vaticano, *Sant'Erasmus di Veroli*, cart.33, *pergamena* 3):

"[...] since the said church [Veroli cathedral] has been completely destroyed by the force of the earthquake, and its parish has been so depopulated that its income is barely sufficient to maintain twelve canons [...]"

[...] quia dicta ecclesia per terremotus ruinam fundamentis est collapsa eiusque depopulata parrochia itaque ipsius fructus, redditus et proventus vix ad duodecim canonicorum sustentationem sufficiunt [...].

By means of a deed of sale dated 13 December 1364, the *rettore* of the church of S. Pietro sold a *casalino* in order to repair the church. However, the document does not explicitly mention the earthquake (Archivio Capitolare, Veroli, *pergamena* 380).

In a letter written at Avignon and dated 20 March 1365, pope Urban V exhorted the faithful to give alms for the completion of reconstruction work on the cathedral (Archivio Segreto Vaticano, *Registra Avenionensia*, vol.159, fol.237r.):

"Since we understand that Veroli cathedral was almost entirely destroyed with all its buildings by the force of the earthquake which struck those parts some time ago".

Cum itaque sicut accepimus ecclesia Verulana cum omnibus edificiis suis ex vehemencia terremotus, qui olim in illis partibus extitit, quasi ex toto corruerit.

By means of a deed of sale dated 15 October 1365, the canons of Veroli cathedral sold a house in order to repair the church (Archivio Capitolare, Veroli, *pergamena* 351).

In a letter to his vicar in Sabina, written at Avignon and dated 19 February 1376, pope Gregory XI referred to the bishop of Veroli's petition concerning the lack of funds for continuing repair work on the cathedral and episcopal buildings (Archivio Segreto Vaticano, *Registra Vaticana*, vol.287):

"[...] destroyed in the widespread earthquake which occurred in those parts, and still requiring reconstruction [...]".

[...] que iam dudum propter generalem terremotum qui in partibus illis fuit corruerunt et usque ad hec tempora destructa manserunt [...].

Ausonia (formerly Le Fratle) and **San Vittore del Lazio** (province of Frosinone)

Of all the fortified villages in the bishopric of Cassino, these were the only two not to be destroyed. The sources are a chronicle and two contemporary notes in the margin of a codex. The chronicle source is an appendix to the year 1349 in Muratori's edition of the *Anonymus Monachus Casinensis* (p.75):

"On 9 September in the year of Our Lord 1349, in the third indiction, there was a great earthquake throughout the kingdom of Sicily, such as there had never been since the world began, except at the death of Christ, and it was so severe in the bishopric of Cassino that the whole monastery was reduced to ruins, and no house remained standing there, and all the monastery's fortified villages were destroyed, except for those of San Vittore and Le Fratle. It happened when mass was being celebrated. Hence many men and women and priests at the altars died in the churches, in addition to those who died in their homes, villages and towns".

Anno domini 1349 tertia indictione die nono septembris, fuit magnus terramotus in toto Regno Siciliae, qualis non fuit ab initio mundi, nisi in morte Christi, et specialiter in episcopato cassinensi, in tantum quod totum monasterium funditus corruit, et remansit in eo nulla domus erecta, et omnia castra monasterii fuerunt diruta praeter castrum Sancti Victoris, et fractarum. Id fuit hora missae. Itaque multi homines, et mulieres, et sacerdotes, et religiosi super altaria, et in ecclesiis mortui sunt, praeter eos, qui in propriis domibus castris, et civitatibus obierunt.

Two contemporary notes written in the margin of a Cassino codex containing the *Regula S. Benedicti* (published in Caravita 1870, vol.2, pp.121, 123-4), contain exactly similar texts. The following is one of them (p.121):

"In the year of Our Lord 1349, in the third indiction, on 9 September, there was a tremendous earthquake in the kingdom of Sicily, especially in the bishopric of Cassino, which entirely destroyed the Cassino monastery and all the fortified villages in that bishopric, except for San Vittore and Le Fratle, and it happened shortly after sunrise and lasted in that bishopric for several days in succession; and people slept in the fields because they were afraid".

Anno domini MCCCXLVIII. III. Indictionis die nono Septembris fuit maximus Terremotus in Regno Sicilie specialiter in episcopatu Casinensi. quod omnino destruxit Monasterium Casinese, et omnia Castra ipsius episcopatus preter Castrum Sancti Victoris et Fractarum et fuit aliquantulum post ortum Solis, et duravit in dicto episcopatu per plures diessequentes. et gens dormiebat in campis propter timorem.

Aversa (province of Caserta)

The cathedral collapsed shortly after the departure of some German and Hungarian knights who had met there. There were no victims. In 1353, pope Innocent VI granted an indulgence to all those who contributed funds for rebuilding the church.

The sources are a letter from Innocent VI and a contemporary chronicle. In a letter dated 21 April 1353, pope Innocent VI exhorted the faithful to give alms for rebuilding the cathedral (Archivio Segreto Vaticano, *Registra Vaticana*, vol.222, fol.350v.):

"To all the faithful in Christ [...] since, as we have learned from a petition from our brother Giovanni, bishop of Aversa, that because of the earthquake shock which struck the kingdom of Sicily and especially the town of Aversa, the cathedral collapsed and was almost entirely reduced to ruins and has in addition been despoiled of its movables by invaders and enemies of the said kingdom [...], we pray and exhort you [...] to contribute by means of alms and charitable legacies to the reconstruction of the said church [...]. Given at Avignon on the eleventh day before the Calends of May [21 April 1353], in the first year [of the pontificate of Innocent VI]".

Universis Christi fidelibus [...] cum itaque sicut et petitionis serie venerabilis fratris nostri Iohannis episcopi Adversanensis nobis nuper exhibita percepimus quod ecclesia Adversanensis propter terremotus concussionem que dudum in Regno Sicilie et specialiter in civitate Adversanensi extitit, fuerit pro maiori parte subversa funditus et diruta et demum per eiusdem Regni invasores et emulos bonis omnibus mobilibus spoliata [...] universitatem vestram monemus et hortamur in Domino quatenus ad reparationem dicte ecclesie [...] elemosinas et pia caritatis subsidia erogetis ut per subventionem vestram huiusmodi ecclesia dicta valeat reparari [...]. Datum Avinionis XI kalendas maii anno primo.

The contemporary *Cronaca* by Matteo Villani (I, pp.86-7) records:

"On the earthquakes which occurred in Italy. In this year [1349], on 10 September, extraordinary and amazing earthquakes began in Italy, and in many parts of the world they lasted for a number of days [...] In the town of Aversa, some German and Hungarian sergeants with many squires and knights held a meeting in the cathedral. As soon as the meeting was over they left the church, and scarcely were they outside when the church collapsed, but by the grace of God no-one was injured".

Di tremuoti furono in Italia. In questo anno, a di X di settembre, si cominciarono in Italia tremuoti disusati e maravigliosi, i quali i[n] molte parti del mondo durarono più di, [...] Nella città d'Aversa, essendo i caporali tedeschi e delli Ungheri con molti conestaboli e cavalieri, a consiglio nella chiesa maggiore, non determinato il loro consiglio uscirono della chiesa, e come fuori ne furono la chiesa cadde, e per volontà di Dio a niuno fece male.

Naples

The city suffered serious damage, but no details are given. The façade and bell-tower of the cathedral collapsed, as well as the façade of S.Giovanni Maggiore. Few people were hurt. Our source is the contemporary *Cronaca* by Matteo Villani (I, pp.86-7):

"On the earthquakes which occurred in Italy. In this year [1349], on 10 September, extraordinary and amazing earthquakes began in Italy, and in many parts of the world they lasted for a number of days [...]. In the city of Naples, they caused the bell-tower and façade of the episcopal church to collapse, as well as the façade of S.Giovanni

Maggiore, and they caused great destruction in many other parts of the city, but with little harm to people".

Di tremuoti furono in Italia. In questo anno, a dì X di settembre, si cominciarono in Italia tremuoti disusati e maravigliosi, i quali in molte parti del mondo durarono più di, [...] Nella città di Napoli fece cadere il campanile, e la faccia della chiesa del vescovado e di Santo Giovanni Maggiore, e in assai altre parti della città fece grandi rovine, con poco danno delli uomini.

Ariano Irpino (province of Avellino)

There is a late inscription (1736) in the cathedral which records that the building was badly damaged (*vastata*) in a long series of earthquakes between 8[4]8 and 1732, including that of 1349. There is a photograph of the inscription in Pantosti and Valensise (1989, p.547).

Sant'Elia Fiumerapido, Giuntura, Mortula, Piumarola, San Pietro della Foresta, San Paolo della Foresta and Teramo (province of Frosinone and Caserta)

As shown above, the sources record that all the villages (*castra*) belonging to the Abbey of Montecassino suffered serious damage in the 1349 earthquake. According to the local historian Lanni (1873), these villages included the ones mentioned above, the first of which was subsequently rebuilt, whereas the others were permanently abandoned and never rebuilt.

We are inclined to accept the suggestion about Sant'Elia Fiumerapido, since it is supported by documentary evidence. Of the other localities, only a few (Giuntura, Mortula, Piumarola) have been identified, but we are not completely convinced by the suggestion that they were abandoned after the earthquake. We have therefore not given them a macroseismic intensity grade, but nevertheless think it of value to situate them within the picture of effects and indicate their position on a map.



1349 01 22 18:00 UT

localities	lat.	long.	I
Iscernia	41 36	14 14	V-VI

1349 09 09 ★ = 42 31 11 56 I₀ = VIII-IX Me = 5.8 Sites: 9 EE: 1

localities	lat.	long.	I	localities	lat.	long.	I
Tuscania	42 25	11 52	VIII-IX	Terni	42 34	12 39	VI-VII?
Viterbo	42 25	12 07	VIII-IX	Bologna	44 30	11 20	F
Onano	42 42	11 49	VIII	Modena	44 39	10 56	III
Orvieto	42 43	12 07	VII-VIII EE	Pisa	43 43	10 24	NF
Perugia	43 06	12 23	VI-VII?				

1349 09 09 ★ = 42 16 13 08 I₀ = IX Me = 6.0 Sites: 17

localities	lat.	long.	I	localities	lat.	long.	I
Colle Sambuco	42 16	13 10	IX	Vallebona	42 16	13 05	IX
Gamagna	42 16	13 08	IX	Razzano	42 20	13 27	A (IX)
Girgenti	42 14	13 05	IX	Santa Maria della V.	42 04	13 21	A (IX)
Mareri	42 16	13 05	IX	L'Aquila	42 21	13 24	IX
Petrella Salto	42 18	13 04	IX	Subiaco	41 55	13 06	VIII-IX
Poggio Poponesco	42 16	13 07	IX	Rome	41 54	12 29	VII-VIII
Radicaro	42 15	13 09	IX	Tarano	42 21	12 36	VII
Santa Maria	42 16	13 10	IX	Ascoli Piceno	42 51	13 35	VI-VII?
Staffoli	42 19	13 03	IX				

1349 09 09 ☉ = 42 01 13 58 I₀ = IX Me = 6.0 Sites: 4 EE:1

localities	lat.	long.	I	localities	lat.	long.	I
Pacile	42 00	13 58	IX	Sutmona	42 03	13 56	VIII-IX
Rocca Gilberti	42 01	14 01	IX EE	Pacentro	42 03	14 00	VII-VIII

1349 09 09 ☉ = 41 35 13 54 I₀ = X Me = 6.3 Sites: 20 EE: 1

localities	lat.	long.	I	localities	lat.	long.	I
Atina	41 37	13 48	X	San Domenico	41 42	13 35	A (IX)
Venafro	41 29	14 03	X	Balsorano Vecchio	41 48	13 34	VIII-IX EE
Isernia	41 36	14 14	IX-X	Sant'Agnello	41 48	13 19	VIII-IX
Alvito	41 41	13 45	IX	Sora	41 43	13 37	VIII-IX
Cardito	41 35	18 58	IX	Veroli	41 41	13 25	VIII-IX
Cassino	41 29	13 50	IX	Ausonia	41 21	13 45	VIII
Cerasuolo	41 35	14 01	IX	Aversa	40 58	14 12	VIII
Sant'Elia Fiumerapido	41 32	13 52	IX	San Vittore del Lazio	41 28	13 56	VIII
Montecassino	41 29	13 49	IX	Ariano Irpino	41 09	15 05	VII-VIII?
San Vincenzo al Volt.	41 39	14 05	A (IX)	Naples	40 51	14 16	VII

< 197 > 1350 late July – mid-August Paphos [Cyprus]

source Notula in Delehay (1907, p.289)

catalogues d. Evangelatou-Notara (1993)

Between late July and mid-August 1350, there were two very strong earthquakes in the island of Cyprus, causing serious damage at Paphos and the surrounding area: almost all the houses and church buildings there collapsed, and there were many victims.

The source is a *Notula* in the margin of manuscript *graecus* 1189 in the Bibliothèque Nationale de France. The *Notula* has been added opposite the *Oration on earthquakes* by Neophytus Enkleistus, a Cypriot saint and hagiographer who lived in the 12th and early 13th century.

The text is in Delehay (1907, p.289):

"In the year <6>858 [1 September 1349 – 31 August 1350], between late July and mid-August, there were two very strong earthquakes at Paphos and its neighbourhood, to the extent that it was almost completely destroyed, in a way that had never happened before in any circumstances; for not a single house remained standing, nor a single church, except for a very few within it, and many people were killed: but spare us, O Lord".

Ἐν τῷ <6>858 ἔτει πρὸς τῇ ἐσχάτῃ τοῦ ἰουλίου καὶ τῷ αὐγούστῳ πρὸς τὸ μέσον, δύο βαρῦτατοι σεισμοὶ γέγονασιν ἐν τῇ Πάφῳ καὶ τῇ πέριξ αὐτῆς ἐνοσίᾳ, ὡς καταπτωθῆναι ταύτην σχεδὸν τέλειον ὡς οὐκ ἐν ἄλλῳ καιρῷ ποτε· οὐ γὰρ οἶκος ἐναπελείφθη ἄπτωτος οὐ ναὸς ἱερὸς εἰ μὴ ὀλίγοι τινὲς ἐντὸς ταύτης (?), καὶ πολλοὶ ἐφονεύθησαν· ἀλλὰ φεῖσαι ἡμῶν, Κύριε.

▲ 1350 late July – mid-August cumulative effects

localities	lat.	long.	I
Paphos	34 48	32 34	X

< 198 > 1351 or 1352 January 24-25 Catania [Sicily, Italy]

source Michele da Piazza, *Hist.*, p.132

literature Boschi and Guidoboni (2001)

historiography Bozzo (1856); Agnello (1992)
catalogues d. Mongitore (1743); Mercalli (1883); Baratta (1901)
catalogue p. Postpischl (1985)

This earthquake does not appear in current seismic catalogues.

The earthquake which struck Catania during the night of 24-25 January 1352, was described as "very great" (*maximus*), and has been known to seismological literature since Mongitore (1743), from whom it was taken into the catalogues of Mercalli (1883) and Baratta (1901). From Baratta it passed into the parametric catalogue of Postpischl (1985), where it was given grade VII on the MCS scale. But it is not listed in the more recent catalogue of Camassi and Stucchi (1997), although their intensity threshold is grades V-VI on the MCS scale. Is this perhaps a case of an earthquake being lost through the authors' critical sensitivity? At any rate, there is information about it in the work of the historian Agnello (1992), who also uses Mongitore (1743) as his source. The only known source for the earthquake is the *Historia Sicula ab anno 1337 ad annum 1361* by Michele da Piazza. He was a Franciscan friar from Piazza Armerina (central Sicily), who lived in Catania around the mid-14th century and hence experienced the earthquake himself. Michele da Piazza almost certainly based the first part of his chronicle on the *Annali del Regno*, a work which is now lost; but he seems to be his own principal source from the year 1349, though it is only from the year 1358 that events are presented as being contemporary. His work pays particular attention to events in Sicily and Catania, even if they are minor, and he provides valuable information about economic and social matters.

He is therefore an extremely reliable source for the history of Catania. The reference to the earthquake comes immediately after the account of a popular uprising in Palermo and the violent repression (*strages*) which followed:

"Readers of this book should therefore know that there was a similar rebellion and a terrible slaughter in the year of Our Lord 1352, in the month of January, on the 25th day of that month, in the fifth indiction; during the night of the previous day there was a very great earthquake at the city of Catania".

Sciunt igitur presentis libris lectores, quod hujusmodi rebellio et strages maxima facta extitit anno domini MCⁱⁱⁱⁱLII de mense januarii, XXV^o ejusdem, V^e indictionis, in nocte cujus precedentis diei in civitate Catanie maximum fuit terremotum.

Moreover, since Michele da Piazza tells us that the earthquake occurred during the night of 24-25 January without specifying the time, we cannot date it with certainty to the 24th or 25th. Mongitore (1743) interpreted the "terrible slaughter" as an effect of the earthquake, but did not transcribe that part of the text which refers to the rebellion. Such an evident though perhaps unintentional "manipulation" of the source text has meant that the earthquake entered the seismological tradition bearing a burden of many victims. But an accurate reading of the text shows that this connection cannot be established: the many deaths were in fact the result of political strife. Nevertheless, Michele da Piazza's expression "very great" (*maximus*) makes it clear that this was not a minor event. In the vocabulary of medieval chronicles such expressions were a distillation of a sort of personal qualitative assessment of the earthquake by the writer, and were by no means used inappropriately. If we look at the unfolding of events as narrated by Michele da Piazza, we find that the term *maximus* has a strong meaning; but in our present state of knowledge, there are no other sources for this earthquake at Catania. The Sicilian historian Bozzo (1876) has shown that the passage in Michele da Piazza's chronicle which deals with the suppression of the uprising at Palermo contains a dating error, and that the correct date for the event is January 1351, not 1352. It is thus possible that the Catania earthquake should also be backdated to 1351.

Unfortunately, this is one of the most turbulent and least well documented periods in Sicilian history: the years from 1347 to 1372 were those of the third period of the Ninety Years' War, when feudal anarchy favoured Angevin reconquest. Only a few years after this earthquake, in 1357, the naval battle of Ognina (Catania) took place, in which Catania defeated the Angevin fleet sent to Sicily by Louis of Anjou.

▲ 1351 or 1352 01 24-25

localities	lat.	long.	I
Catania	37 30	15 05	VII-VIII?

< 199 > 1352 October 11 – November 9 [Ramadan 753 H.] Cairo [Egypt]

sources	al-Maqrizi, <i>al-Suluk</i> , II, 3, p.876
literature	Taher (1979)
catalogues d.	Poirier and Taher (1980); *Ambraseys <i>et al.</i> (1994)

One evening in the month of *Ramadan* in the year of the Hegira 753 (11 October – 9 November 1352), an earthquake was felt in Cairo, but no damage is recorded. The contemporary Cairo writer al-Maqrizi states:

"In the month of *Ramadan*, an earthquake took people by surprise at the time of evening prayer".

حدثت زلزلة في رمضان والناس في صلاة العشاء الآخرة.

According to Ambraseys *et al.* (1994), al-Maqrizi's statement in fact means that Cairo felt the earthquake of October 1353 in Crete.

While that is possible, it is preferable — given the lack of more precise information, and in our present state of knowledge — to interpret what al-Maqrizi says as evidence of an earthquake at Cairo in 1352.

▲ 1352 10 11 – 11 9 [Ramadan 753 H.]

localities	lat.	long.	I
Cairo	30 03	31 15	IV

< 200 > 1352 December 25 Sansepolcro [central Italy]

< 201 > 1353 January 1 Sansepolcro

sources 1	[manuscripts] ASBo, <i>Signorie visc. eccl. e bentiv. Riformag.</i> , III, regg.25-26 (1353); Azario, <i>Liber</i> , p.59; Villani M., <i>Cron.</i> , I, pp.382-4, 404; Villola, <i>Chron.</i> , pp.19-20; Giov. Bazz., <i>Chron.</i> , p.152; Battagli, <i>Marcha</i> , p.56; Levalossi-Gazata, <i>Chron.</i> , cols.71-2; <i>Ann. Caesen.</i> , p.187
sources 2	BMedLaur, Florence, Plut. 66.25, <i>Libellus</i> , fols.15r., 18r.-v.; BRiccMor, Florence, <i>Mss. Moreniani</i> , 277, <i>Priorista</i> , fol.86v.; <i>Mss. Riccardiani</i> , 1851, <i>Diario</i> , fols.46v.-47r.; BCSansepolcro, J.107, Bercordati, <i>Cron.</i> , fols.27v.-28r.; BUBo, <i>Mss.</i> , 97, Alberti, <i>Hist.</i> , fol.260; BCABo, <i>Mss.</i> , B.2355, Bianchetti, <i>Ann.</i> , fol.187; <i>Mss. Malvezzi</i> , 59-63, I, fol.242; <i>Cron. Ramp.</i> , p.19; <i>Chron. Esten.</i> , p.186; <i>Cron. città Perugia...</i> , p.167; Mar. Moro, <i>Mem.</i> , p.106; Pellini, <i>Dell'Hist.</i> , I, p.629
historiography	Buoni (1571); Ammirato (1600); Clementini (1617-27); Farulli (1713); Graziani (1745); Amiani (1751); Mecatti (1755); Muratori (1762-64); Muzzi (1842-44); Goracci (1847)
literature	Castelli and Moriani (1990); Castelli (1991); Castelli <i>et al.</i> (1997)

catalogues d. Bonito (1691); Pilla (1846); Ferrey (1848); Mallet (1853); Mercalli (1883); Giovannozzi (1895a); Baratta (1901); Milne (1911); *Boschi *et al.* (1995, 1997, 2000)
catalogues p. Giorgetti and Iaccarino (1971); Carrozzo *et al.* (1973); Postpischl (1985); CPTI (1999)

On 25 December 1352 and 1 January 1353, two destructive earthquakes struck the upper Tiber valley, affecting the towns of Borgo San Sepolcro (present-day Sansepolcro) and Città di Castello in particular.

1352 December 25 The first earthquake occurred towards sunset (16:30 UT approx.) and caused some buildings in Sansepolcro to collapse. The foundation stones of the walls which rose above the outermost ditch, although at a depth of more than 4 metres, were hurled out of the ground. The effects at Città di Castello were less severe, but the castle tower collapsed, and Elci castle, situated on the border between the territories of Sansepolcro and Arezzo, where the Torre dell'Elci now stands, was destroyed.

1353 January 1 The second earthquake caused the complete collapse of the town walls and almost all those buildings at Sansepolcro which had not collapsed in the 25 December earthquake. The bell-tower of the abbey where commune documents were kept collapsed. The felt area extended as far north as Bologna.

There were many victims: 500 were killed at Sansepolcro in the first earthquake, and total deaths amounted to more than 2,000 (or 3,000).

The area where the earthquake effects were principally felt was one of great economic and commercial importance, and it had already been struck by an outbreak of plague the year before.

The Boccognani, who were the most powerful members of the local Ghibelline faction, left the town of Sansepolcro together with the mercenaries, who returned to Bologna. As for the reaction of the affected population, the sources record that many inhabitants of Sansepolcro fled into the squares, the town gardens and the surrounding countryside, while many others were entombed in the ruins and died for lack of help.

Reconstruction work began in the early months of 1353, thanks both to the help of Giovanni Visconti, duke of Milan, and to the substantial wealth of the people of Sansepolcro. Their riches, as Matteo Villani points out, had partly been inherited and came partly from speculation over the provision of supplies to the Milanese troops; and so they set about building new houses and palaces that were more beautiful than before.

The historical background was that of an alliance negotiated in 1352-1354 between Sansepolcro and Giovanni Visconti, who was both archbishop and duke of Milan. These were the years when the Visconti embarked on a Tuscan military expedition against Florence and her subject towns, making use in part of troops from her own subject city of Bologna. A few years later, after the failure of the Milanese expedition, Sansepolcro fell under Florentine dominion again.

The sources for this earthquake have been analysed and discussed by Boschi *et al.* (1995). There is evidence of the earthquake in archive documents from some Bolognese *riformagioni* (city council edicts) issued in 1353. They record the payment of compensation by the Visconti *signoria* (to which Bologna was then subject) for some horses used by the Bolognese garrison, which had "died in the service of the commune of Bologna at the Borgo San Sepolcro at the time of the earthquake"; or again, which "[...] died in the service of the commune at the Borgo of San Sepolcro because of the earthquake".

mortui in servicio comunis Bonon. in burgo Sancti Sepulcri ocaxione teremotus.
"[...] mortui in servitio comunis in burgo Sancti Sepulcri propter terremotum.

As far as contemporary chronicles are concerned, the main sources are Matteo Villani's *Cronica* (ed. Porta 1995), in which there is a detailed description of the effects of the

two earthquakes at Sansepolcro and the reconstruction of those buildings which had been destroyed, and the *Liber gestorum in Lombardia* by the Lombard notary Pietro Azario (ed. Cognasso 1925-39). The latter records the effects of the earthquake at Città di Castello, which the author claims to have witnessed himself. Villani records: "Of the great earthquakes which occurred in Tuscany and other areas.

On 25 December of the said year [1352], at vespers, there were great earthquakes, which caused the collapse in Borgo San Sepolcro of some of the buildings in that territory, and as many as five hundred men, women and children were killed. And the castle of Elci, on the border between Arezzo and Borgo (San Sepolcro), collapsed, taking with it those who were there to defend it on behalf of the archbishop of Milan. For some days the earthquakes ceased, and then on the thirty-first day of that month, as the night drew towards the morning of the Calends of January [1 January 1353], major earthquakes began again at dawn. And in the said territory of Borgo (San Sepolcro) they were so terrible that they reduced almost all the buildings in the area to ruins. The shaking during the night, and the collapses on all sides meant that those few who survived fled naked into the gardens and squares, and for most of the local people and those from elsewhere, the houses became tombs for their lacerated bodies. And many of those who were injured or half dead remained for several days without help under the beams and ceilings and other concavities created by the ruins. And many died who would have survived if they had received help. Walls collapsed on all sides and it was heart-breaking to see the slaughter of so many people, carried off as they were to such a harsh sentence of death; and the number of people of both sexes who died in the ruins amounted to more than two thousand. And it is worth recording what happened to them through being subject to tyrannical government. Struck with fear by the first earthquakes, they had left the town and were living in the fields, where they would have survived; but for fear of losing the town, the above-mentioned Piero Sacconi and Nieri da Fagiucola, together with the archbishop's vicar, mounted their horses and forced the local people and the soldiers back into the town. Some fancifully supposed that this was a special judgment from God, but the fact is that these were the first Tuscans to welcome the people of that great tyrant, the archbishop of Milan, thereby causing consternation amongst their neighbours. And with all the loot which they unjustly took from their neighbours, they were acquiring things for nothing and growing unduly fat and rich; for these earthquakes had caused no damage in Tuscany. [...] At this same time [May 1353], the archbishop of Milan sent 300 master (masons) to rebuild the walls and houses of Borgo San Sepolcro which had been damaged or ruined by the earthquake. Those local people who survived had become particularly rich, by inheriting from the dead, and by the scandalous profits they made from loot from their neighbours which they carried to Borgo (San Sepolcro), or because they had continuously sold both provisions and equipment to the soldiers at high prices. Then when the master masons arrived, they began building houses and palaces, and making dwellings which were much more luxurious and beautiful than those they had possessed before; but they were not able to build much, because the town changed its state, as we shall narrate at the appropriate place below".

Di grandi tremuoti vennono in Toscana, e in altre parti.

A dì XXV dicembre del detto anno, in sul vespero, furono grandi terremuoti, i quali abatterono al Borgo a Sansipolcro una parte de li deficii della terra, con danno di bene cinquecento tra uomini e femine e fanciulli morti. E lla rocca d'Elci in su' confini tra Arezzo e l Borgo sobissò, con que' viventi ch'erano a guardalla per l'arcivescovo di Milano. E sollevati i tremuoti alquanti dì, poi a dì XXXI del detto mese, la notte, vegnente la mattina calen di gennaio in sul mattutino rinovellarono maggiori terremuoti. E alla detta terra del Borgo furono sì terribili, che quasi tutti li edifici di quella terra fece rovinare, nel cui scotimento, per la notte e per le roine d'ogni parte,

pochi ne poterono campare, fuggendosi ignudi nelli orti e nelle piazze della terra, e quasi la maggiore parte de' terrazzani e de' forestieri che v'erano feciono delle case sepolture a llacerati corpi, e molti magagnati e mezzi morti stettono parecchi di senza aiuto sotto le travi e' palchi e altre concavità fatte per la roina, e assai ne morirono che sarebbero campati se avessero avuto soccorso. Le mura dalla terra d'ogni parte caddono: e di vero grand pietà fu a vedere l'escidio di cotanti Cristiani involti in così aspro giudicio della loro morte, che fatto conto, più di II M uomini d'ogni sesso spirarono sotto quelle ruine. E nonn-è da lasciare senza memoria quello ch'avenne loro per essere sotto la tirannia, che per paura de' primi terremuoti erano usciti della terra e stavano a campo, e sarebbero campati, ma per tema della terra il detto messer Piero Sacconi, e Nieri da Faggiuola col vicario dell'arcivescovo vi cavalcarono, e per forza costrinsono i terrazzani e' soldati a ritornare nella terra. Alcuno favoleggiando dissono che questo fu singulare sentenza di Dio, però che costoro furono i primi in Toscana che diedono ricetto alla gente del gran tiranno arcivescovo di Milano, in confusione de' loro circostanti; e tutte le prede indebitamente tolte a' loro vicini comperavano per niente ingrassando e arricchendo di quelle indebitamente, non avendo i detti terremuoti in Toscana fatto alcun danno. [...]

In questo medesimo tempo l'arcivescovo di Milano mandò per fare redificare le mura e lle case del Borgo a Sansipolcro, rovinata e guaste per lo tremuoto, trecento maestri. I Borghigiani rimasi in vita erano sopra modo ricchi per l'eredità de' morti, e per gli sconci guadagni delle prede de' loro vicini condotte al Borgo, e perché a' soldati al continuo avieno venduto caro la loro vittuaglia e li altri arnesi, e però, venuti i maestri, cominciarono a edeficare le case e' palagi, e fare troppo più nobili e più belli abituri che prima non avieno; ma poco poterono edeficare, che lla terra mutò stato, come apresso raconteremo nel suo tempo.

Azario records:

"However, when the above-mentioned people of the lord of Milan came back to live in Borgo San Sepolcro, there occurred an astonishing and extraordinary event. For on the eve of the nativity of Our Lord Jesus Christ or on the previous day, during the night, an earthquake struck that town [Sanssepulcro], with the result that as the towers and *palazzi* collapsed, and as the walls of buildings crashed against one another, they were soon destroyed to such an extent that few could be seen still standing; and if the Saracens had sworn to raze that town to the ground, they could not have reduced it to such a degree of destruction even in a week. But by the grace of God, few people died. And it is a fact that the stones placed at the foundations of the walls rising above the outermost ditch, as we have already said, were thrown out of the ground, and the depth of this ditch and in particular of these walls was ten cubits [more than four metres]. The earthquake also affected part of the above-mentioned town of Città di Castello, but it was not so strong there. And the following week, too, at the third hour, there was another earthquake at the same town, and on that occasion the tower and keep of the castle in the town were split open and destroyed, and the son of the castellan and many others died in the ruins, and many other houses which had escaped the first earthquake collapsed and, as I mentioned above, I saw widespread destruction and ruination. For this reason, the mercenaries and the *Boccognani*, who were the most powerful Ghibelline faction [in Borgo San Sepolcro], went away and completely abandoned the town, not wanting to die without a battle. And shortly afterwards they all returned to Bologna, having left these places behind in a state of devastation".

Reversis autem predictis gentibus Domini Mediolani ad habitandum in Burgo Sancti Sepulcri, mirabilis casus ultra modum emersit. Nam in vigilia nativitatis domini nostri Jesus Christi vel die precedenti, noctis tempore, talis terremotus ipsam terram invasit quod tures et palacia corruentes et parietes murorum simul collidentes et in

brevi hora taliter sunt quassate, quod quasi aliqua erecta vel pauce videbantur et certe, si Sarazeni iurassent ipsam terram prosternere, non fuisset in una epdomanda sic dirupta. Et gens pauca periit, quod fuit gratia Dei; et verum fuit quod lapides existentes in fundamento murorum super fossa exteriori, ut est dictum, prosilierunt super terram, cuius fossati et precipue murorum profunditas erat decem cubitorum et sic fuit terremotus ab una parte Civitatis Castelli antedictae, sed non tam magnus. Et etiam sequenti epdomanda, hora terciarum, fuit alius terremotus in ipsa terra, in quo turris cum cassero castris dicte terre per medium scisa dirupta estitit et sub ipsa filius castelani cum pluribus aliis periit et multe alie domus a primo terremotu evase corruerunt, quarum domorum ut supra destructionem et prostrationem infinitam vidi. Ex quo stipendiarii cum illis de Bòcagnanis, potencioribus partis gibeline, exiverun, terram ipsam totaliter destituentes, nolentes sine bello mori. Et post paucam moram omnes Bononiam rediverunt, dimissi dictis partibus sic vastatis.

After mentioning the serious damage at Borgo San Sepolcro on 1 January 1353, Pietro Villola's 13th century Bolognese chronicle (ed. Sorbelli 1910-40) also mentions the fact that the shock was felt at Bologna, but it was so slight there that people doubted whether there really was an earthquake:

"1353

In the said year, on the first day of the new year, there were great earthquakes at Borgo San Sepolcro, so violent and strong that scarcely a house or a tower was left in the said Borgo (San Sepolcro). And it was also felt at Città di Castello and in those parts; and in this city [Bologna] there were people who were not sure about it, but thankfully it did no damage".

Miic liii

In lo dito milleximo, e fo lo dì d'anno novo, vene gran teramoti a Borgo San Sepolcro, e si feri e grandi, che no romaxe quaxe nè caxa nè torre in lo ditto Borgo. E sentine la Città de Chastello e quelle contrade; et in questa città fo gente che n'avé dubio, ma no ce fo niente: de gracia.

▲							
1352 12 25 16:00 UT Sites: 3							
localities	lat.	long.	I	localities	lat.	long.	I
Sansepolcro	43 34	12 08	VIII-IX	Città di Castello	43 27	12 14	VII
Torre dell'Elci	43 26	12 04	VIII-IX				
1353 01 01 0:30 UT							
localities	lat.	long.	I	localities	lat.	long.	I
Sansepolcro	43 34	12 08	IX	Bologna	44 30	11 20	II

< 202 > **1353 April before Melfi [southern Italy]**

source ASVat, *Registra Vaticana*, vol.222, fol.341r., Innocent VI (pope), Letter, 22 aprile 1353

This earthquake is unknown to Italian seismic catalogues.

In our present state of knowledge, the only available source is an unpublished letter from pope Innocent VI, dated 23 April 1353, in which he grants an indulgence to all those who contribute to the repair of the cathedral at Melfi, a town in Basilicata (a region in southern Italy), which had been badly damaged by earthquakes and warfare. The bishop of Melfi had been responsible for urging the pope to encourage the repair of the church.

The date of this earthquake is uncertain because it is only possible to establish a *ter-*

minus ante quem in the form of the date of the papal document. It is difficult even to guess how much time elapsed between the earthquake and the date of the document, for while it is true that the papal chancery was usually fairly prompt in dealing with petitions received, in this case we do not know how much time elapsed between the earthquake and the bishop of Melfi's request. And what is more, he makes a general statement that war was a contributory cause of the damage, thereby complicating even further the dating of the earthquake, and introducing a factor which must be kept in mind in assessing effects. The damage referred to here cannot be related to the September 1349 earthquakes (see the preceding entry) because of the considerable distance between Melfi and the places further south which were damaged in 1349 (Ariano Irpino, for example, is about 75 km from Melfi).

The letter from Innocent VI is preserved in the Archivio Segreto Vaticano (*Registra Vaticana*, vol.222, fol.341r.). It reads as follows:

"To all the faithful in Christ [...] as we have been informed in a petition from our brother Nicola, bishop of Melfi, that the church of the Virgin Mary at Melfi has suffered serious damage from the earthquakes and wars from which that area has suffered so much, and has been almost completely destroyed [...] to all those who are truly penitent [...] and will contribute to the restoration of the church we grant three years and one hundred and twenty days indulgence [...]. Issued at Avignon on the tenth day before the Calends of May [22 April 1353], in the first year [of the pontificate of Innocent VI]."

Universis Christi fidelibus [...] cum itaque sicut petitio venerabile fratris nostri Nicolai episcopi Melfiensis nobis nuper exhibita continebat Melfiensis ecclesia, quem honorem et sub vocabulo beate Virginis Marie constructa fore dicitur, propter terremotus et guerras que in illis partibus vigruerunt, diructa extiterit et quasi toto confracta [...] omnibus vere penitentibus et confessi qui [...] ad huius reparationem dicte ecclesie manus porrexerint adiutrices tres annos et tres quadragenas de iniunctis eiis penitentiis [...] misericorditer relaxamus [...]. Datum Avinioni X kalendas maii anno primo.

▲ 1353 04 before

localities	lat.	long.	I
Melfi	41 00	15 39	A (IX)?

< 203 > 1354 March 1 Sea of Marmara [Turkey]

sources Greg., *Hist.*, III, pp.220, 223; Cantac., *Hist.*, IV.38, III p.277-8; *Chron. min. Byz.*, 7.13; 87.3, in Schreiner (1975, pp.66, 613); Palamas, *Op.*, IV, pp.121-2; Villani M., *Cron.*, I, p.459

historiography Charanis (1938); Babinger (1944); Charanis (1955); Meyendorff (1966); Schreiner (1977); Philippidis-Braat (1979); Ducellier (1980)

catalogues d. Bonito (1691); Perrey (1848; 1850); Mallet (1853); Downey (1955); Grumel (1958); Wirth (1966); Ambraseys and Finkel (1991); Evangelatou-Notara (1993); *Papazachos and Papazachou (1997)

catalogues p. Ergin *et al.* (1967); Shebalin *et al.* (1974); Galanopoulos (1981)

During the evening of 1 March 1354, a violent earthquake struck the north coast of the Sea of Marmara. Severe damage was suffered by nearly all the towns and the fortresses between Madytus (present-day Eceabat) and Rhaedestus (now Tekirdag). The town walls collapsed at Gallipolis and neighbouring localities. At Constantinople, many large buildings collapsed, as well as part of the city walls. The earthquake also struck Tenedos (present-day Bozcaada). Many people were killed, but we are not told

the exact number. Encouraged by the collapse of the town walls, the Turks turned their attention to Gallipolis and captured it.

Information about this earthquake is to be found in the works of many contemporary Byzantine writers and in one chronicle in Italian.

The Byzantine historian Nicephorus Gregoras experienced the earthquake himself while at Constantinople, and left a dramatic account of it:

"and after sunset, as soon as the second hour of the night came, just as I had as usual intoned the evening hymns to Christ the Lord in my house, at the place where we had once placed the image of Christ next to that of his holy mother, a sudden violent earthquake, equal to the extraordinarily great ones of the past, shook all the ground on which we stood. And since I was indoors, I did not know what was going on outside at that time, either at Byzantium [Constantinople] or in the other towns which had been struck. The earthquake violently shook and rocked the whole of our house, causing it to split open and collapse at several points, and our books were thrown from their places to the floor. My sudden state of apprehension and the appreciably increasing violence of the earthquake caused me to bid farewell to life, as I expected to be swallowed up with the floor and the house. For, at that moment, I could see no place of refuge from the wrath of God, whether it came on account of our wickedness or was designed as a manifest warning, and so I stood rooted to the spot, struggling to keep my feet down, but unable to withstand the strong movement of the ground".

καὶ μετὰ δύοσιν ἡλίου δευτέρας ὥρας ἄρτι νυκτερινῆς ἀγομένης, καὶ τὰς ἐσπερίους ἐμοῦ συνήθως ὠδᾶς ἀποδιδόντος Χριστῷ τῷ θεῷ περὶ τὸ τοῦ οἴκου ἐνδότερον, ἔνθα καὶ τὴν αὐτοῦ θείαν εἰκόνα μετὰ τῆς αὐτοῦ πανάγνου μητρὸς πάλαι προεστησάμεθα, κλόνος ἐξαίφνης ῥαγδαῖος καὶ τῶν πάλαι θαυμαζομένων ἐπὶ μεγέθει ἐνάμалλος πᾶσαν ἐφ' ἧς ἐστήκαμεν ἐτίναξε γῆν. καὶ τὰ μὲν ἔξω τέως ἡγνύουν πάθη, κεκλεισμένος ὢν, ὅσα τε Βυζάντιον καὶ ὅσα τὰς ἄλλας συμπέτωκε πόλεις παθεῖν ὄλον δ' οὖν ἐδόνησε καὶ συνετάραξε μάλα σφοδρῶς τὸν ἡμέτερον οἶκον, ὡς καὶ μέρη πλείω ῥαγέντα χεῖσθαι πρὸς τοῦδαφος ἔνθεν κάκειθεν, καὶ τὰς μὲν ἡμέτερας βίβλους ἐξ ἔδρας ἀναρρηγνυμένας ῥίπτεισθαι χαμαί. τὸ γε μὴν παρατεταμένον τῆς ὥρας καὶ ἢ κατὰ βραχὺ πρὸς τὸ βιαιότερον προκοπή τοῦ σεισμοῦ καὶ ἀπαγορεύειν ἤδη με τὸ ζῆν προσηνάγκαζεν, αὐτῷ τε ἐδάφει καὶ αὐτῇ συγκαταδύεσθαι προσδοκῆσαντα τῇ οἰκίᾳ. ἐγὼ μὲν οὖν τέως οὐκ ἔχων ὅποι βλέψας τὴν θείαν ἐκείνην διαφονγεῖν ὄργην, ἢ τε νῦν διὰ τὰς ἡμέτερας ἐπῆει κακίας καὶ ἢ μέλλουσα ταῖς φαινόμεναις ταύταις ἀπειλαῖς ἐνεζωγραφεῖτο, ἐς τὸ πεπηγὸς καὶ βεβαίως ἰστάμενον ἐρηρισμένους τοὺς πόδας ἔχειν ἐφιλονεῖκουν μὲν, ἀντείχειν δ' οὐκ εἶχον πρὸς πάνυ ἀστατοῦσαν γῆν.

Gregoras returns to the subject of the earthquake when recounting a visit to Agathangelus in the early autumn of 1354. After referring to the earthquake, he records that the survivors ended up in the hands of the "barbarians", i.e. the Turks (pp.223-4).

Another source is the memoirs of the Emperor John VI Cantacuzenus (1347-1354). He records the damage suffered by towns in Thrace, and the invasions of the Turks:

"In the early spring, a sudden and unexpected earthquake occurred, which destroyed almost all the coastal towns of Thrace, especially in the early hours of the night. Not only did houses collapse on top of their inhabitants, killing them all, but town walls were also uprooted from their foundations. And those citizens who were not killed in the ruins, immediately observed that they could not easily rebuild those parts of the walls which had collapsed, nor defend themselves against a possible attack by the barbarians — who were ready to do battle — and fearing that they would be enslaved after such an attack, they took up their women and children and fled during the night towards other towns which they thought had been spared the earthquake. In persistent rain, as well as indescribable snow and cold, some died of exposure, especially

women and small children. The remainder — apart from those few who managed to withstand the cold and seek refuge in surviving towns — were all enslaved by the barbarians when they arrived on the scene. In fact, as soon as the latter discovered that town walls had been destroyed, and suspecting that they would be able to capture refugees (as was indeed the case) and, if any inhabitants were left behind, defeat them thanks to the walls having been destroyed, they immediately marched off at dawn, capturing the refugees and establishing a garrison in all the towns”.

ἀθρόον ἐξαίσιος ἐπιγενόμενος σεισμὸς ἦρος ἀρχομένου, μάλιστα ἐν ἀρχαῖς τῆς νυκτὸς, τὰς παραλίους τῆς Θράκης πόλεις ὀλίγου δεῖν διέφθειρεν ἀπάσας. οὐ μόνον γὰρ οἰκίαι κατέπεσον ἐπὶ τοὺς κατοικοῦντας, καὶ διέφθειραν πολλοὺς, ἀλλὰ καὶ τὰ τῶν πόλεων τείχη ἐξ αὐτῶν κρηπίδων κατεβλήθη. οἱ δῆμοι δὲ τῶν πόλεων, ὅσοι μὴ διεθάρησαν ὑπὸ τῶν ἐρειπίων, συνιδόντες ὡς οὐτ' ἀνορθοῦν δυνήσονται ῥᾶστα τὰ καταβλημένα τῶν τειχῶν, οὐτ' ἀμύνεσθαι πρὸς τοὺς βαρβάρους, ἀν ἐπίωσιν, ἀξιόμαχοί εἰσι, καὶ δεῖσαντες, μὴ ὑπ' ἐκείνων ἀνδραποδισθῶσιν ἐπελθόντων, τέκνα καὶ γυναῖκας ἀναλαμβάνοντες, ἀνεχώρουν τῆς νυκτὸς ἐπὶ τὰς ἄλλας πόλεις, ὅσας μὴ καταλεπτοκέναι τῷ σεισμῷ ἐνόμιζον. ὄμβρων δὲ ἐπικειμένων, καὶ χιονος, καὶ ψύχους ἀμυθήτου, οἱ μὲν ὑπὸ τοῦ χυμοῦ διεφθείροντο, μάλιστα γυναῖκες καὶ βρέφη νήπια· οἱ λοιποὶ δὲ πλὴν ὀλίγων, ὅσοι τοῦ τε ψύχους ἠδυνήθησαν περιγένεσθαι, καὶ πρὸς τὰς ἔτι σωζόμενας πόλεις καταφυγεῖν, πάντες ὑπὸ τῶν βαρβάρων ἠνδραποδίσθησαν ἐπελθόντων. ὡς γὰρ ἦσθοντο ἐκεῖνοι τὰ τείχη τῶν τειχῶν καθηρημένα, ὑποπεύσαντες, ὅπερ ἦν, ὡς ἡ κρατήσουσι φευγόντων, ἢ τῶν τειχῶν καθηρημένων, ἀν μένωσι περιγενήσονται, ἅμα ἔφ' ἐπεστράτευσαν, καὶ τῶν τε ἀνθρώπων ἐκράτουν φευγόντων, καὶ τὰς πόλεις ἀπάσας ἐποίησαντο ὑπὸ φρουρᾶ.

Cantacuzenus goes on to describe the occupation of Gallipolis by the Turks.

There is further contemporary evidence of the earthquake in the *Letter to his church*, written by Gregory Palamas, metropolitan of Thessaloniki, in the summer of 1354. After recording the effects of the earthquake in general terms, he then adds important information:

“And also what I know not whether to call a punishment or abandonment inflicted by God on our people, and especially the earthquake of this year which, as the poet says [*Iliad* 1, 4-5], has caused not only houses and property but also bodies and souls to be a prey to crows and all birds of prey, whether endowed with reason or not”.

ἔτι δὲ καὶ τὰς ἀνωθεν οὐκ οἶδ' εἴτε παιδείας εἴτ' ἐγκαταλείψεις χρῆ λέγειν τοῦ καθ' ἡμᾶς γένους καὶ μάλιστα τὸν τῆτες σεισμόν, ὃς οὐ κτίσματα καὶ κτήματα μόνον, ἀλλὰ καὶ σώματα καὶ πνεύματα, κατὰ τὸν ποιητὴν, ἐλώρια τεῦχε κύνεσσιν οἰωνοῖσι τε πᾶσι, λογικοῖς καὶ ἀλόγοις.

The next passage is autobiographical, and Palamas indicates in it that the earthquake was also felt at Tenedos, where he happened to be at the time.

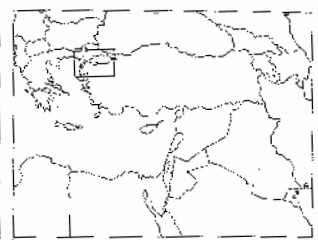
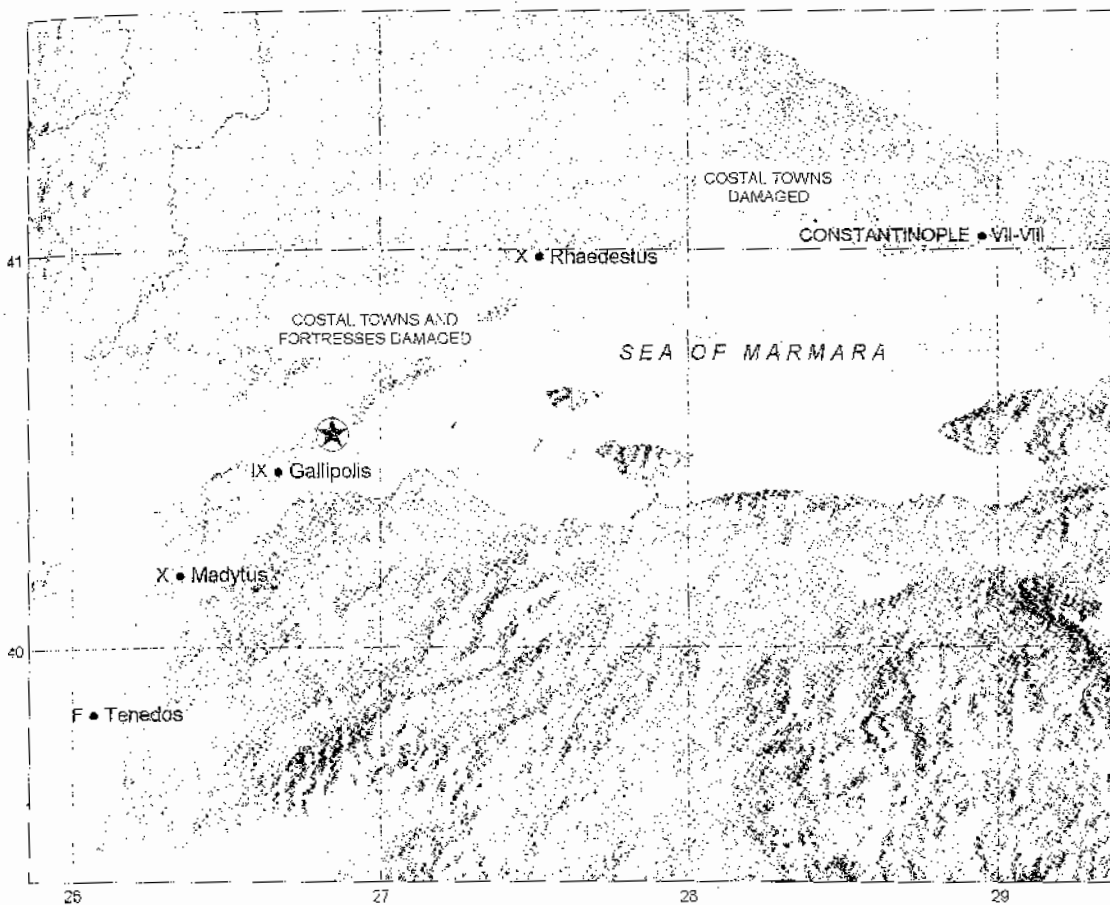
“A few days after that earthquake” (μετὰ δὴ τὸν συσσεισμόν ἐκείνον ὀλίγας ἡμέρας), Palamas embarked at Tenedos for Gallipolis:

“This earthquake had delivered the city into the hands of the Achaemenids, whom we now call Turks”.

κακείνην ὁ σεισμὸς ἐκείνος τοῖς Ἀχαμενίδας, οὓς νῦν Τούρκους καλοῦμεν, ὑπεποιήσατο.

At fol.147v. of Istanbul codex Haga Triada 72 (Schreiner 1975, no.87) we find information which permits us to date the earthquake precisely to 1 March 1354:

“In the year 6862, in the seventh indiction [1 September 1353 – 31 August 1354], on the first day of the month of March, a Saturday, the first in Lent, at the second hour of the night, there was a terrifying earthquake and the *kastra* of Macedonia, mostly along



1354
March 1



fig. 94

the coast between Madytus and Rhaedestus, were razed to the ground, and there were many victims. The surviving inhabitants were a prey to raids by the godless Agarenes. Since then, woe to the Christians!”.

ἔτει ρωξβ', ἰνδικτιώνος ζ', μηνὶ μαρτίῳ α', ἡμέρα σαββάτω, πρώτη τῶν νηστειῶν, ὥρα β' τῆς νυκτός, σεισμός ἐγένετο φοβερῶτατος καὶ ἐχάλασαν κάστροι τῆς Μακεδονίας, τὰ πλεῖστα δὲ τὰ κατὰ γυαλὸν ἀπὸ τῆν Μάδυτον [cod. Μάδετον] ἕως τὸν Ῥαιδεστόν, ἐκ τῶν θεμελιῶν αὐτῶν, καὶ ἐσκοτώθη λαὸς οὐκ ὀλίγος. ὁ δὲ ὑπολειφθεὶς λαὸς ἐπάρθη παρὰ τῶν ἀθέων Ἀγαρηνηῶν. καὶ οὐαὶ τοῖς Χριστιανοῖς ἔκτοτε.

In 1354, the first day of March was indeed a Saturday.

Redaction I of *Reichschronik 7* (Schreiner 1975), however, dates the earthquake to 2 March 1354:

“In the year 6862, in the seventh indiction [1 September 1353 – 3 August 1354], on 2 March, the night of the feast of Orthodoxy, during the reign of the Emperor John Cantacuzenus, there was so great an earthquake that even the walls of Gallipolis and neighbouring places collapsed, and they were delivered into the hands of the Agarenes for Heaven knows what sins”.

ἐν ἔτει ρωξβ', ἰνδικτιώνος ζ', μηνὶ μαρτίῳ β', τῆ νυκτὶ τῆς Ὁρθοδοξίας, ἐπὶ τῆς βασιλείας κυροῦ Ἰωάννου τοῦ Καντακουζηνοῦ, γέγονε σεισμός μέγας, ὅτε καὶ τὰ τεῖχη κατέπεσον τῆς Καλλιουπόλεως καὶ τῶν μετ' αὐτὴν καὶ παρεδόθησαν οἷς κρίμασιν οἶδε Θεὸς τοῖς Ἀγαρηνοῖς.

Redaction II of the same chronicle repeats the same information in abbreviated form.

The earthquake is also mentioned by the contemporary Florentine historian Matteo Villani, who continued the famous *Nuova Cronica* of his brother Giovanni:

"On the earthquakes which took place.

On this same first day of March [1353, Florentine Incarnation style; 1354, modern style], there were very great earthquakes in Romania [the Byzantine Empire], and in the noble city of Constantinople they knocked down many great and noble buildings and a large part of the city walls, killing many men, women and children. And from Boccadave [an old name for the Dardanelles] to Constantinople, along the coast, every castle and town suffered serious damage to walls and buildings and a great number of victims amongst their inhabitants, with the result that their neighbours, the Turks, realising that the Greeks were frightened and could not shut themselves up for protection in their fortresses, attacked them, and took many prisoners, making slaves of them; and they rebuilt and reinforced some castles, installing Turkish inhabitants and guards there; and shortly afterwards they assembled a large army and besieged Constantinople from the land, for it was divided and afraid, but the people united in defending it against the Turks; and when some time went by without their succeeding in capturing the city, they attacked farms and plundered villages, and meeting no resistance outside the walls, they returned to their own country".

Di tremuoti che furono.

In questo medesimo di primo di marzo furono i(n) Romagna grandissimi terremuoti, e nella nobile città di Gostantinopoli abatterono molti grandi e nobili edeficii e gran parte delle mura della città, con grande uccisione d'uomini, e di femmine, e di fanciulli. E da Boccadave infino a Gostantinopoli, su per la marina, no(n) rimase castello né città che non avesse grandissime rovine delle mura e delli edeficii con grande mortalità de' suoi abitanti; per la qual cosa avvenne che' Turchi loro vicini sentendo i Greci spaventati, e senza potersi racchiudere e salvare nelle fortezze, corsono sopra loro, e presonne assai, e menarli in servaggio: e alcuni castelli rifecono e afforzarono, e misonvi abitatori e guardie di loro Turchi; e apresso acolsono grande esercito di loro gente, e puosono assedio per terra a Gostantinopoli, che era in divisione e in tremore, ma contro a' Turchi s'unirono alla difesa; sicché stativi alcuno tempo senza potere acquistare la città, corsono le ville, e rubarono le contrade, e senza avere resistenza fuori delle mura si tornarono i(n) llo ro paese.

Though suspecting that only a single event was involved, Perrey (1850, p.20), listed two earthquakes: one on 1 March 1353, and the other in the early spring of 1354. He thought the first stretched from Romagna (in Italy) to Constantinople. But he clearly misunderstood Villani's use of the term *Romania/Romagna*, which in this context indicates the Byzantine Empire and not the region of Italy of the same name. Furthermore, he fails to take account of the dating style known as "Florentine Incarnation style", and so places the earthquake one year too early. The same wrong dates also appear in Perrey (1848, p.125); and Mallet (1853, p.41) fell into the same trap. Baratta (1901, p.54) is also basing himself on Villani's chronicle when he records an earthquake in the Romagna region in Italy in March 1353.

Grumel (1958, p.481) mistakenly lists two earthquakes, dating the first to 2 March 1354 at Constantinople, and the second to the early spring of 1355 on the coast of Thrace. In fact, there was only one earthquake.

▲ 1354 03 01 17:00 UT		★ = 40 32 26 51		$I_0 = X$	$M_e = 6.3$	Sites: 5	
localities	lat.	long.	I	localities	lat.	long.	I
Eceabat	40 11	26 21	X	Istanbul	41 02	28 57	VII-VIII
Tekirdag	40 59	27 31	X	Bozcaada	39 50	26 04	F
Gelibolu	40 25	26 41	IX				

< 204 > **1355 December 23 – 1356 December 21 [805 A. e.]**
Erznca [eastern Turkey]

sources Ar. Tabr., *Book*, p.472; chronicle in Yovsep'ean (1951, no.88, col.208)
 historiography Incicean (1822); Xanlaryan (1990); Zeyt'unyan (1991)
 literature Abich (1882)
 catalogues d. Sieberg (1932a); Grumel (1958); Step'anyan (1964)
 catalogue p. al-Hakeem (1988)

In the year 805 of the Armenian era (23 December 1355 – 21 December 1356), a short seismic sequence occurred at Erznca (present-day Erzincan, in Turkey). There are discrepancies between the sources as to the earthquake's effects. According to the 17th century historian Arakel of Tabriz, who probably made use of reliable local sources, the earthquake simply made house roofs move, without causing damage; but a report in a colophon in Arm. Jerus. manuscript 819 suggests that the city walls collapsed.

Arakel of Tabriz reports: "In the year 805 [23 December 1355 – 21 December 1356], there was an earthquake at Eznkan. Seven and nine days [times?] the roofs swayed. With God's protection it did not collapse".

Թուին Պե. շարժ եղել յեզնկան՝ ի յօրս է. և թ. հեղ երերայր. Աստուած պահեաց ոչ փլաւ.

The colophon in Arm. Jerus. manuscript 819, containing the historical narrative of Kyriakos, includes a chronicle (1018-1603), which records:

"In the year 805, the walls of Eznga collapsed in an earthquake".

Թժին Ջե փլաւ երզնկին պարիսպ ի շարժէն.

▲ 1355 12 23 – 1356 12 21 [805 A. e.]

localities	lat.	long.	I
Erzincan	39 44	39 30	VII-VIII?

< 205 > **1356 late September – early October Cordoba [southern Spain]**

source Villani M., *Cron.*, I, pp.809-10
 catalogues d. Bonito (1691); von Hoff (1840); Taramelli and Mercalli (1886); Martínez Solares and Mezcua Rodríguez (2002)

In late September and early October 1356, there was a strong earthquake in southern Spain: many buildings collapsed at Cordoba, Seville and the surrounding areas, killing a large number of people, though the exact number is not indicated in the source.

The source is the *Cronica* of Matteo Villani, who continued the chronicle begun by his more famous brother Giovanni. Although he lived far from where the earthquake struck, he was a contemporary writer:

"Of the great earthquakes which occurred in Spain. In this year 1356, at the end of September and for some days at the beginning of October, there were some very great earthquakes in Spain, causing widespread and serious damage to many buildings in the great cities of Cordoba and Seville and in the neighbouring area, killing a great many men, women and children, and burying them in the ruins of their homes".

Di gran tremuoti furono in Ispagna. In questo anno MCCCLVI, a l'uscita del mese di settembre e alquanti di all'entrata d'ottobre, furono in Ispagna grandissimi terremuoti, i quali lasciarono in Cordova e in Sibilìa grandi e gravi rovine di molti difici in quelle due città grandi, e nelle loro circostanze, nelle quali perirono uomini, femine, e fanciulli in grandissimo numero, facendo sepoltura delle loro case.

▲ 1356 09 -- early 10

localities	lat.	long.	I	localities	lat.	long.	I
Cordoba	37 53	-04 46	VIII-IX	Seville	37 23	-05 59	VIII-IX

< 206 > 1359-1381 Elbasan [Albania]

inscription	inscription on the church of St. John Vladimir at Elbasan, in Aristarchis (1878, p.98, no.25) = CIG IV, 774; Mentzou Meimari (1977-79, p.103, no.129)						
historiography	Popa (1957); Ducellier (1981); Mentzou-Meimari (1992)						
catalogues d.	Evangelatou-Notara (1993); *Papazachos and Papazachou (1997)						
catalogue p.	Shebalin <i>et al.</i> (1974)						

At an unspecified time between 1359 and 1381, a strong earthquake completely destroyed the church of St. John Vladimir at Elbasan (in present-day central Albania). Reconstruction work, which produced a much larger building than before, was sponsored by Charles Thopia, regent and sovereign of Albania from 1359 to 1388. Information about the earthquake is to be found in

■ - an inscription on a marble plaque above the south entrance to the church of St. John Vladimir at Elbasan:

"Know that this church was completely destroyed by an earthquake during the reign of and in the days when the whole land of Albania was ruled by the great Karla Theopias I, nephew by blood of the king of France. He rebuilt this noble church of St. John Vladimir, and raised it anew from its foundations with ardent faith and heart. From the birth of Christ to the building of the church is a period of 1381 years. Since the creation of the world, 6890 years have passed. He has reigned so far for 22 years, in the 5th indiction, the first solar cycle, and the twelfth lunar cycle. The church which you now see has been made larger than the old church which stood here before".

† Χρή γινώσκ(ειν) ὅτι ὁ ναὸς οὗτω(ς) κατελύθη ἀπὸ σεισμοῦ παντελῶς ἕως θεμελίου εἰς τὴν διακράτησιν καὶ ἐν ἡμέραις αὐθεντεύοντος πάσης χώρας Ἀλβάνου πανυψωτάτου πρώτου Κάρλας ὁ Θεόπις, ἀνεψιὸς δὲ καὶ (ἐξ) αἵματος ῥυγ(ός) τῆς Φραγγίας. Αὐτὸς δὲ ἀνοικοδόμησεν τὸν πάνσεπτον ναὸν τοῦτον τοῦ ἁγίου Ἰωάννου τοῦ Β(λ)αδημήρου, καὶ ἀνίγειρεν αὐτῶ(ν) ἐκ βάρου μέχρι τέλους ἐκ πίστεως (τ)ε καὶ ζεοῦσι(ς) καρδία(ς). Ἀπὸ Χριστοῦ Γεννήσεως ἕως οἰκοδομήσεω(ς) τοῦ ναοῦ ἔτη ,α(π)α(.). ἀπὸ δὲ Κτίσεως κόσμου εἰσὶν ἔτη ,ζω(ρ). Αὐθεντεύοντος δὲ ἕως τότε κβ' ἔτους, ἰνδικτιόν(ος) τῆς ε'. ἡλίου κύ(κλων) α'. σελήνης κύ(κλων) ι(β'). ἐκ(ίσθ)η δὲ ὁ ναὸς (ὄν) ὀρᾶς (ὁ) μέγιστος, ὡς (π)ρὶ(ν) ὁ παλεὸς ναὸς.

Charles Thopia came to the throne in 1359, when he succeeded Tanush Thopia the Elder (PLP 7742). In the mid-14th century, the Thopia family had taken Dyrrachium from the Angevins, and because they wished to stress continuity with the royal house of France, Prince Charles described himself as being of royal French blood. The titles of lord of all Albania and sovereign of Albania are similar to Venetian and Ragusan titles.

▲ 1359-1381

localities	lat.	long.	I
Elbasan	41 06	20 05	A (IX)

< 207 > 1361 July 17 Ascoli Satriano [southern Italy]

sources 1	Villani M., <i>Cron.</i> , II, p.536; Luois (king) and Joanna I (queen), Order, 11 February 1362, in Bonito (1691, p.570)		
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- sources 2 ASVat., *Reg. Lat.*, 503, Calixtus III (pope), Letter, 24 September 1455; *Sacra Congr. Conc.*, Rel., b.81A, Asculana et Ceriniolensis I, 1595, 1600, 1607, 1615, 1618, 1624, 1655; Martin V, (pope), Letter, 28 August 1426, in Ughelli (1721, VIII, cols.230-1)
- historiography Bella Bona (1656); Ughelli (1721); Zuccagni Orlandini (1845); Paci (1853); Cardillo (1885); Camera (1889); Rosso (ed. 1907); Nigri (1914); Jacobone (1962); Morea (1968); Passaro (1980) Molin (1985)
- literatura Manetti [1457]; Bonito (1691); Perrey (1848); Mallet (1853); Capocci (1861); Mercalli (1883); Baratta (1893, 1901); *Boschi *et al.* (1995, 1997, 2000)
- catalogues d. Giorgetti and Iaccarino (1971); Carrozzo *et al.* (1973); Postpischl (1985); CPTI (1999)
- catalogues p.

On 17 July 1361 at about 17:15 UT (the hour of vespers), there was a destructive earthquake in the hilly area now in the provinces of Foggia and Bari. The worst affected town was Ascoli Satriano, where most buildings collapsed and there were more than 4,000 victims. At Canosa di Puglia, part of the town walls collapsed and many buildings were damaged.

This was the most important area of feudal Apulia, whose only towns of any size were indeed Ascoli Satriano and Canosa di Puglia. From an economic point of view, Ascoli Satriano still held a position of importance even after the earthquake, partly because of the size of its communal estates, and partly because it was a centre of feudal power. But it was another forty years before substantial reconstruction of the town was begun. As far as historical background and institutional forms are concerned, it must be remembered that Ascoli Satriano and Canosa di Puglia were both towns in the kingdom of Naples. They were situated in Capitanata, one of the three provinces into which Apulia was divided (the other two being the Terra d'Otranto and the Terra di Bari).

The earthquake is recorded in two contemporary sources: the chronicle of Matteo Villani and a document of 1362 reproduced in Bonito (1691). Villani records:

"Of great earthquakes which occurred in Apulia and caused massive damage in the town of Ascoli. On 17 July in that year [1361], at the hour of vespers, there were very great earthquakes in Apulia. They damaged the town of Ascoli in Apulia, reducing it almost entirely to ruins and killing more than four thousand people. Part of the town walls collapsed at Canosa, and it reduced many buildings to ruins; but elsewhere it did little damage".

Di grandi terremoti che furono in Puglia, e assai guastarono della città d'Ascoli. A dì XVII di luglio del detto anno, in sull'ora del vespero, furono in Puglia grandissimi terremoti, e apersono la città d'Ascoli di Puglia, e quasi tutta la sobissarono con morte d'oltre a quattromila Cristiani. A Canossa caddono parte delle mura della terra, e molti defici puose i[n] ruina; in altre parti fece poco danno.

The earthquake is mentioned in passing in a document which was formerly preserved in the Archivio della Regia Zecca in Naples, but is now lost. The text is given in Bonito (1691, p.570). It is an order issued by king Louis and queen Joanna I, dated 11 February 1362 (in the fifteenth indiction), authorising a certain Cicco Strazzato to retrieve a quantity of wheat which had probably been buried in the ruins caused by the earthquake.

The authorisation refers to the fact that the earthquake had occurred "in recent days": Cicco Strazzato had probably lodged his petition in the days immediately following the earthquake of 17 July 1361. The authorisation granted in reply was issued some months later, but probably reflects an expression used in the petition. Bonito quotes this document within the context of the earthquake of September 1349, but Ascoli Satriano is a long way from that earthquake's known damage zone; and the expressions used by the royal chancery make it unlikely that an earthquake which occurred twelve years earlier is being referred to. The text given by Bonito is as follows: "Authorisation is hereby given to Cicco Strazzato, a servant living at Ascoli, to extract one hundred *salme* of wheat which he still had after the unexpected earthquake of recent days at the town of Ascoli. Given on 11 February, in the fifteenth indiction [1362], by king Louis and queen Joanna".

Cicco Stracato habitatori Exculi familiari expeditur Provisio pro extractione sal. Frumenti ce(n)tum quae ei remanserant post Terraemotum inopinatum, qui diebus proximo praeteritis in Civitate Exculi contigit. Sub datum die 11. Februarii Indictione 15. per Ludovicum Regem, et Ioannam Reginam.

The earthquake and subsequent wars had substantial long term effects at Ascoli. In a letter (published in Ughelli 1721, cols.230-1) written by Martin V (1417-1431) at Genzano on 28 August 1426 and sent to the bishop of Lucera, the pope points out that because of the earthquake and subsequent wars, the people of Ascoli had been obliged to rebuild their town on a different and more easily defended site. However, they had already rebuilt the cathedral in its original position in the old town, and now complained of the substantial inconvenience and even impossibility of going there for religious services. In a letter written in Rome by Calixtus III (1455-1458) to the bishop of Troia on 24 September 1455, the pope pointed out that Ascoli cathedral had been largely demolished by the duke of Venosa, for fear that it would be occupied by enemies, with the result that the town was still without a cathedral more than ninety years after the earthquake.

▲ 1361 07 17 17:15 UT

localities	lat.	long.	I	localities	lat.	long.	I
Ascoli Satriano	41 12	15 34	X	Canusa di Puglia	41 13	16 04	VIII

< 208 > **1362 December 21 – 1363 December 20** [812 A. e.]
Mush area [Armenia]

source Sam. An. Cont., p.169
 historiography Kostancanc' (1902); Zeyt'unyan (1991)
 literature Abich (1882)
 catalogue d. Step'anyan (1964);
 catalogue p. Ergin *et al.* (1967)

In the year 812 of the Armenian era (21 December 1362 – 20 December 1363), a strong earthquake struck the territory of Mus, possibly causing damage at local monasteries. Our source for this event is a brief report in the continuation of the chronicle of Samuel of Ani:

"In 812 [21 December 1362 – 20 December 1363], the sun grew dark, and an earthquake ravaged the territory of Mush and shook the monasteries".

ի ՊԺԲ: արեգակն խաւարեցաւ. և շարժն զԼՄուշու երկիրն տարաւ. և զվանորայք խախտեաց.

▲ 1362 12 21 – 1363 12 24 [812 A. e.]

localities	lat.	long.	I
Mus	38 44	41 30	VII-VIII

< 209 > **1365 January 4 Algiers [Algeria]** ▷ tsunami <

sources 1 El-Brechki, *Memories*, in Delphin (1922, pp.216-7)
 sources 2 al-Suyuti, *Kashf*, p.56
 historiography Devoulx (1869); Delphin (1922)
 literature Ambraseys and Vogt (1988); Yelles Chaouche (1991)
 catalogue d. Mokrane *et al.* (1994)
 catalogue Ts Soloviev *et al.* (2000)

The city of Algiers was struck and largely destroyed in a sequence of violent tremors which began on 4 January 1365. We are told that there were 486 shocks on the first night alone; and further damage was probably caused by sea flooding. The number of victims was so great that the native Berbers were encouraged to attack the occupying Arabs, and they regained control of the city. The shocks continued for some years without causing further damage. This important event gained entry into seismological circles thanks to Ambraseys and Vogt (1988), who list it in a summary of "materials" for the study of seismicity in pre-20th century Algeria. It has been used by subsequent studies (Yelles Chaouche 1991) and by current catalogues in Algeria (Mokrane *et al.* 1994), as well as in the catalogue of tsunamis by Soloviev *et al.* (2000, p.40).

It is worthwhile pausing to review the nature of the basic source for this event, because what we appear to have here is a fairly rare case in historiography — though perhaps not so rare for countries like Algeria — involving large documentary gaps.

The information in Ambraseys and Vogt (1988) derives from a study by the French Arabist Delphin (1922), which was published after his death by W.Marçais. Delphin had maintained that where the history of Algeria was concerned it was necessary to have recourse to Arabic and Turkish manuscript chronicles which were already "extremely rare" in his day. With the aim, therefore, of filling a centuries-long gap in indigenous information, he made a French translation of an Arabic manuscript which he said he had found in an Algiers bookshop. Delphin wrote that he had verified that it had belonged to Albert Devoulx, keeper of the Arab State Archives in the mid-19th century. The manuscript consisted of nine large sheets, each of 17 lines and with writing on both sides. The writing was clear and elegant, and was recognised by Delphin as the hand of a local man of letters who had joined the State Archives after 1830 and had worked with Devoulx. The identification was based on the fact that Delphin had other documents copied by the same person. So the manuscript, published in French translation by Delphin, was a 19th century copy of an Arabic text, now lost. The manuscript had already been mentioned by Devoulx (1869), who had dated it to 1734 and identified it as a work of the son of the *mufti* Hossein ben Redjeb Chaouch. Although a copy, the authenticity of the text remains unimpaired. The information it provides on this and other Algiers earthquakes, as well as on events in the city under the last pashas (i.e. up to 1745) is extraordinarily important, in view of the almost total lack of other information. As though in a Chinese box, the report of the earthquake is inserted by the author of the 18th century manuscript into a second-hand quotation for purposes of a historical digression on earlier destructive events at Algiers. As far as the 1365 earthquake is concerned, the author of the manuscript states that he is basing his remarks on the account of a journey by El-Brechki, who experienced the event himself. In the first part of his narrative, the author of the manuscript provides a summary of the event, and only then goes on to provide part of his source, perhaps word for word:

"In his account of the journey, El-Brechki says that [Algiers] was destroyed in an earthquake in 766 [of the Hegira = 28 September 1364 – 17 September 1365]. [The earthquake] was felt during the night of 10 *Rabi ath-Thani* [= *Rabi' II*] [4 January 1365] after sunset prayers. Most of the city was destroyed and such a large number of inhabitants perished that the Berbers were able to take possession of it. They took over all the buildings. Their domination spread, and in the end they were able to place all the inhabitants under their control. El-Brechki says: 'The night of the earthquake I was in a house at Haret el-djenan, in the area of the Bab-el-oued Gate: I witnessed amazing things that none has recorded before me. I heard a woman being questioned by a citizen about the danger in which she had found herself. She replied to him: I was in the company of my sister and was holding my daughter in my arms. I ran around the house from place to place until part of it collapsed on top of me. My sister was buried [in the ruins] and I fled. Then another part [of the house] collapsed unexpectedly. I threw my daughter to the ground to make myself lighter, and sought refuge in flight without her. So when I

realised that I was about to become a victim, I abandoned my daughter among the ruins. In this connection I recalled the story of a woman who, when the flood came, fled with her child. The water was getting higher and higher. She put him beneath her feet in order to raise herself a little higher. The water submerged them both, but in the end the woman I have just mentioned reached safety and it was her companions who perished. I have been told that an educated and reliable man said that on that one night he had counted 486 shocks. These earthquakes continued for some years, but without causing any more damage."

The violence of the earthquake can be inferred from certain details, even though these are solely concerned with human behaviour. Not least is the fact that the upheaval in the city led to a radical political change.

It is clear that the earthquake was fairly well known, for it was absorbed into the Arab historical tradition amongst events sufficiently important to be worthy of record. It is in fact mentioned, very briefly, by the great Arab geographer al-Suyuti (15th century), though he does not know where it occurred:

"In 766 [of the Hegira = 28 September 1364 – 17 September 1365] there was a very violent earthquake. I saw this written on the back of a work; there was no indication of the place where it happened".

وفي سنة ست وستين وسبعمائة كانت زلزلة عظيمة رأيت ذلك مكتوباً على ظاهر كتاب ولم يعين بأي مكان كانت.

▲ 1365 01 04

localities	lat.	long.	I
Algiers	36 50	03 00	IX Ts

< 210 > 1365 July 25 Bologna [northern Italy]

- source 1 Villola, *Chron.*, III, p.201
- sources 2 BUBo, *Mss.*, 1439, Dalle Tuate, *Hist.*, I, fol.168r; *Mss.*, 97, Alberti, *Hist.*, I, fol.224r; BCABo, *Mss.*, B.2355, Bianchetti, *Cron.*, fol.228; *Mss. Malvezzi*, 59-63, Bianchetti, *Ann.*, I, fol.277; *Cron. Ramp.*, II, p.200; Ghirardacci, *Hist.*, II, p.289; Vizani, *Diece*, p.220
- historiography Faleoni (1649); Masini (1666); BUBo, *Mss.* 770, Ghiselli, *Mem.* (18th c.); Muzzi (1840-46); Guidicini (1868-73); Gozzadini (1880)
- literature Camassi and Mohin (1994); Guidoboni (1997); Guidoboni and Ciuccarelli (2003a)
- catalogues d. Bonito (1691); Perrey (1848); Mallet (1853); Mercalli (1883); Baratta (1901); Milne (1911); *Boschi *et al.* (1995, 1997, 2000)
- catalogues p. Giorgetti and Iaccarino (1971); Carrozzo *et al.* (1973); Postpischl (1985); CPTI (1999)

On 25 July 1365, at about 18:00 UT (the first hour of the night, "Italian time"), a powerful earthquake struck the city of Bologna. Substantial details about its effects are to be found in a secondary source which probably made use of texts which are now lost. The earthquake caused the collapse of three houses belonging to the Lambertini family, and killed four of its members. A butcher's shop also collapsed, and the Confortati tower (in present-day Via San Benedetto XIV) was so badly damaged from top to bottom that the local authority decided to demolish it, for fear that it might collapse on to neighbouring houses. The church of S.Michele dei Leprosetti, in present-day Piazza S.Michele, required restoration; and the rear of the church of S.Maria del Carrobbio (then in present-day Piazza della Mercanzia, but now no longer in existence) also collapsed. Many privately owned buildings in the Saragozza and Lame districts were also repaired. Repair work lasted until 1366. The chronicle compiled by the paper merchant Floriano Villola (who continued his father's chronicle from 1362 onwards) provides us with a personal record of the earthquake:

"25 July [1365], the feast of St. James. On this night too, there were earthquakes at Bologna and great claps of thunder".

Di XXV de luio, lo di de san Iacomo. Anche mo questa note si fo terremoti in Bononia e gran troni.

The same information is recorded in the 15th century *Cronaca Rampona*. The effects of the shocks are not recorded in either of these two chronicles, but they are considered in some detail in the *Historia di Bologna* by the Augustinian monk Cherubino Ghirardacci, a reliable 16th century Bolognese scholar and historian, who probably used sources which are now lost. Ghirardacci writes:

"The year 1365. [...] But let us return to matters concerning Bologna. It was about the first hour of the night when the city felt so great an earthquake that the populace was struck with terror, for many public and private buildings collapsed to the ground, including three houses belonging to the Lambertini da Santa Tecla family, in which Lippo, his wife, and two small Lambertacci children were killed. Rolandino Gurrini's butcher's shop collapsed, and the Confortati tower in Via dei Bagnaroli was damaged from top to bottom. [...] Since it was so badly damaged, the Senate had the Confortati tower demolished, for fear that it might collapse and destroy the houses of the Sabbadini family. Restoration work was also carried out on the church of S. Michele di Leprosetto and the Carrobbio church, the back of which had completely collapsed. Many buildings in Saragozza and Lame [two city districts] were also repaired. And this repair work went on until the following year".

L'Anno 1365. [...] Ma ritorniamo alle cose di Bologna. Era circa un' hora di notte, quando nella Città si senti un così gran terremoto, che ne pose in grandissimo spavento tutto il Popolo, percioche ne andarono per terra molti Edificij pubblici, e privati, frà quali rovinarono trè Case de' Lambertini da Santa Tecla, dove morirono Lippo, la moglie, e due suoi figliuoli piccioli de' Lambertacci. Ruinò la Beccaria di Rolandino Gurrini, e la Torre de' Corforati nella via de' Bagnaruoli s'aperse infino a' fondamenti. [...] Intanto il Senato fece abbassare la torre de' Corforati conquassata dal Terremoto, temendo, ch'ella non ruinasse, e mandasse à terra le case de Sabbadini. Fù anco ristorata la Chiesa di S. Michele di Leprosetto, e quella del Carrobbio, che dalla parte di dietro era tutta caduta à terra. Si ristorarono anche molti Edifici in Saragozza, e nelle Lame. E con questi ristori si giunse all'Anno seguente.

There is an ambiguity in Ghirardacci's text as regards the date of the earthquake, which is in fact not stated explicitly. The only precise chronological indication preceding the description of seismic effects is the date 7 April, which is given as the day when Bishop Aimeric of Bologna obtained a privilege from Charles IV appointing him prince of the Holy Roman Empire. Ghirardacci then goes on to describe an extraordinary event which occurred in Treviso in that same year 1365, as recorded in the town annals. When he returns to his narrative of events in Bologna and the earthquake, Ghirardacci makes no reference to the previously mentioned date of 7 April. We have therefore thought it preferable to date the earthquake to 25 July 1365, as specifically stated by Floriano Villola, rather than 7 April, though the latter date has been accepted by Baratta (1901, p.55), amongst others. It should be pointed out that in the 14th century, Bologna had no official body called "Senate" — the term used by Ghirardacci — since it was not instituted until 1513 by Leo X. No results were obtained from research carried out at the Archivio di Stato in Bologna, where we consulted the following collections: *Comune, Curia del Podestà; Estimì di città e contado; Comune, Governo; and Demaniale.*

▲ 1365 07 25 18:00 UT
localities lat. long. I
Bologna 44 30 11 20 VII-VIII

< 211 > **1366 September 7 – 1367 August 27** [768 H.] **Safad [Israel]**

source Ibn al-'Imad al-Hanbali, *Shadarat*, VI, p.210
 literature Taher (1979)
 catalogues p. Poirier and Taher (1980); al-Hakeem (1988)

In the year of the Hegira 768, which corresponds to the period 7 September 1366 – 27 August 1367, Safad (present-day Zefat, in Israel) was struck by a strong earthquake. No damage is recorded. The source for this event is the famous Syrian Arab historian Ibn al-'Imad al-Hanbali (1622-1679):

“In that year [768 H.] there was a dreadful earthquake at Safad”.

فيها كانت زلزلة هائلة بصفد.

▲ 1366 09 07 – 1367 08 27 [768 H.]

localities	lat.	long.	I
Zefat	32 58	35 30	V

< 212 > **1369 February 1** **Alessandria [northern Italy]**

source 1 ABCapVercelli, De Rotis, *Diario*, fol.75v.
 source 2 Schiavina, *Ann.*, col.357; BCVercelli, *Mss.*, A.28, Bellini, *Ann.*, fol.150
 historiography Ghilini (ed. 1903-15); De Conti (1838-42)
 catalogues d. Mercalli (1883, 1897); Baratta (1901); Milne (1911); *Boschi *et al.* (1995, 1997, 2000)
 catalogues p. Giorgetti and Iaccarino (1971); Carrozzo *et al.* (1973); Postpischl (1985); CPTI (1999)

On 1 February 1369, two places in Piedmont were struck by an earthquake. The only contemporary evidence concerns Masserano (now in the province of Biella), but gives no indication of specific effects. According to late 16th century historiography, the earthquake was very violent, and a number of buildings were either damaged or destroyed. Masserano was a *castello* in the diocese of Vercelli, about 30 km from Biella, and had long been claimed by both the bishop and the commune of Vercelli. It was made a *contea* in 1506 by pope Julius II. In 1335, after a period of autonomy as a commune, Vercelli became subject to the Visconti, lords of Milan, and did not fall into the hands of the House of Savoy again until 1427.

The only contemporary source relates to Masserano and consists of the unpublished diary (now in the Archivio e Biblioteca Capitolare in Vercelli) of a notary called De Rotis. De Rotis went to Masserano little more than a month after the earthquake and gathered information from the inhabitants. Since the effects of the earthquake are not given in detail, it is reasonable to assume that any damage must have been limited in extent. De Rotis writes:

“Also in the year 1369, on 1 February, there was an earthquake which particularly affected Masserano in the diocese of Vercelli, as was told and confirmed to me by many people in that same year, on Thursday 8 March, the day when I was at Masserano, and where on that same day I heard thunder and lightning”.

Preterea anno nativitatis Domini MCCCLXVIII die primo february fuit terremotus precipue in loco Messerani diocesis Vercellensis prout mihi a pluribus estitit dictum et affirmatum dicto anno die iouis VIII^o marcii quo die in ipso loco Messerani eram et ibi tunc audivi tronitrua et fulgora ipso die.

As far as Alessandria is concerned, the first writer to mention the earthquake is the 16th century historian Schiavina (ed. 1863), whose remarks are taken up by Ghilini (ed. 1903-15), a 17th century historian from that town. Schiavina records:

"The next year [1369], during the night following the Calends of February [the night from 1 to 2 February], the earth shook so greatly that a number of buildings at Alessandria were shaken to the extent that some were damaged and some destroyed".

Postero anno, nocte, sequente diem kalendarum fabruarii, terra adeo horrende tremuit, ut Alessandriae aedificia plura, eo concussa partim vitium fecerint, partim corruerint.

Our uncertainty about the effects of the earthquake is due to a lack of documentary evidence, resulting from the fact that the local chronicle tradition concerning Alessandria and at Vercelli is not available.

▲ 1369 02 01

localities	lat.	long.	I	localities	lat.	long.	I
Alessandria	44 55	08 37	VII-VIII	Masserano	45 36	08 14	V-VI

- < 213 > 1373 March 3 (2:00 UT) Central Pyrenees-Catalonia [Spain]
> tsunami, clouding and stopping of springs, landslides <
- < 214 > 1373 March 3 (3:00 UT) Barcelona Catalonia
- < 215 > 1373 March 3 (6:00 UT) Barcelona
- < 216 > 1373 March 8 Barcelona
- < 217 > 1373 March 19 Barcelona
- < 218 > 1373 May 3 Barcelona
- < 219 > 1373 May 23 Barcelona
- < 220 > 1373 July 22 Barcelona
- < 221 > 1373 September 22 Montpellier [France]

sources 1 ACAr, Barcelona, *Audiència*, Conclusions Civils, I, fol.68r-v; *Cancellaria*, Castrorum, reg.1466, fol.108r., 9 April 1373; fol.113r-v., 29 November 1373; Sigilli Secreti, reg.1239, fol.65r-v., 25 June 1373; Curiae et Sigilli Secreti, reg.1088, fol.38v., 23 August 1373; reg.1089, fol.59v., 24 May 1373; Speciale, reg.1582, fols.61v.-62r., 2 September 1373; Pecuniae, reg.1356, fols.123r-v., 12 December 1373; Gratiarum, reg.925, fols.118v.-119r., 18 February 1374; reg.927, fol.111r., 18 April 1375; *Mestre Racional*, reg.503, fol.60v., 3 February 1374; AMCervera, *Llibre de Consells*, 1373, fol.12r-v., 9 March 1373; AMLleida, *Llibre de Consells*, 1372-73, fol.57r., 3 March 1373; fol.57v., 8 March 1373, fol.58v., 9 March 1373; AMTortosa, *Llibre de Claveria*, 1372-73, fol.85v., 5 March 1373; fol.86r., 11 March 1373; fol.87r., 2 April 1373; fol.94r., 8 June 1373; BCPerpignan, ms.84, *Mem.*, fol.1r. *Notulae*: in Battelli (1987, p.345); in Mengel (1909, p.68); in Devic and Vaissete (1879, cols.260-1); in Vidal (1902, p.454); Torralles, *Diet.*, p.214; *Chron. Ulian.*, col.759; *Petit Thal.*, pp.389-90; Mascaro, *Chron.*, p.66; *Chron. Pontif. Cont. Aven.*, p.416; *Chron. Userc.*, p.415; Zurita, *Anales*, bk. 10, chap.16

inscription on the church of St-Eulalie, Bordeaux, in Bernadau (1844, p.335) and in Augier (1887, p.xv)

sources 2 *Petite Chron.*, p.63; *Cròn. rac. ciutat Barcel.*, p.147; *Rúbr. Brun.*, p.17; Maurel, *Remar.*, p.410; Du Buisson, *Hist.*, pp.166, 276

literature Riera Melis *et al.* (1986); Olivera *et al.* (1991); Olivera *et al.* (1992a); Olivera *et al.* (1994a)

catalogues d. Bonito (1691); Perrey (1847); Mallet (1853); Sieberg (1932b); Fontserè and Iglésies (1971)
catalogues p. Lambert *et al.* (1996); *Atlas sísmic de Catalunya* (1999); Martínez Solares and Mezcua
Rodríguez (2002)

History of the earthquake's interpretation

The earthquake of 3 March 1373 which struck the central Pyrenees and Catalonia has been the subject of thorough studies by Catalan, French and Belgian medieval historians and seismologists in the second half of the 1980s and the first half of the 1990s. The first of these new investigations was the important study by Riera Melis (1986), who carried out original research in the central and outlying archives of Catalonia. The first results of an examination of the newly discovered sources were published in Riera Melis *et al.* (1986), and this new information was compared to our previous state of knowledge, deriving from 19th and 20th century seismological literature. Riera Melis *et al.* (1986) also includes a documentary appendix with a complete transcription of 15 sources concerning the cities of Barcelona, Tortosa and Lleida (for a general discussion of sources and research methodology in relation to medieval earthquakes in Catalonia, see also Riera Melis 1987). In Olivera *et al.* (1991, pp.231-3), there is a brief survey of studies in the historical seismicity of Catalonia, using the earthquake of 3 March 1373 and its aftershocks as an example. It is referred to again, with further details, in Olivera *et al.* (1992a).

The above pieces of research were later brought together in an important work by Olivera *et al.* (1994a), which is in fact the most thorough study of the earthquake currently available. The research in question stemmed from interdisciplinary collaboration between a variety of European scholars, namely Catalan, French and Belgian medieval historians and seismologists, the latter being brought in to study the effects of the 1373 earthquake in French territory north of the Pyrenees. The monograph by Olivera *et al.* (1994a) is in Catalan with an English translation, and is enhanced by the inclusion of a valuable appendix which gathers together in 69 entries all the sources consulted. Each entry is divided into 12 parts and contains not only a transcription of the text of the original source, but also other information concerning the author, date of composition, chronology, and affected locations, together with a discussion of the source's reliability. The documentary appendix is not translated into English, however. The research published in Olivera *et al.* (1994a) takes as its point of departure a re-examination of the information gathered together in Fontserè and Iglésies (1971) — a basic point of reference and the starting point for every study of the historical seismicity of Catalonia. The new unpublished archive sources and the new published chronicle and narrative sources identified and recorded in Olivera *et al.* (1994a) have made it possible to substantially amplify and modify the picture of effects supplied by Fontserè and Iglésies (1971). It has been possible to identify the areas of maximum effects of the earthquake of 3 March 1373 in the Ribagorza area — effects which had been attributed to a shock dated to 2 February 1373 in Fontserè and Iglésies (1971). To the seven locations in Fontserè and Iglésies's catalogue, a further 15 have been added (of which five are in Spanish territory and ten in French). Some mistakes have been corrected: effects attributed to Ullà have been transferred to Barcelona; and those attributed to the town of Olot through a place name error have now been transferred to Santa Maria d'Oló. Of the sequence of 18 shocks listed in Fontserè and Iglésies (1971) in the period 1370-1378, 10 have proved to be false events, resulting from a confusion of dates from earlier seismological literature, while the other 8 are now confirmed and accompanied by fresh and more reliable information. In addition, Olivera *et al.* (1994a), using the MSK scale, have classified and mapped 19 localities, 3 regions (Ribagorza, Lodève and El Rosselló) and three extensive felt areas (Spain, the Pyrenees and Catalonia), though without indicating the epicentre; and they have identified an effect on the natural environment.

Aims of this review

The survey set out below derives from the above study by Olivera *et al.* (1994a), from which we have taken the text of the published and unpublished sources in the original language, providing an English translation ourselves, since none is provided in that study. Our reexamination of the sources has enabled us to draw attention to certain data not emphasised in Olivera *et al.* (1994a): we classify one more region (Toulouse); and we identify and locate on a map the effects on the natural environment of the principal shock (tsunami, landslides and water effects); we locate the macroseismic epicentre, using the MCS scale to classify areas and localities; and we attribute intensities to the localities affected by the eight known aftershocks which followed the strongest shock – aftershocks which are identified but not classified in Olivera *et al.* (1994a).

Problems of chronology concerning the earthquake of 3 March

March 3 2:00 UT

The principal shock occurred during the night of (Ash) Wednesday 2 – Thursday 3 March 1373. While many sources give the date as 2 March and others 3 March, almost all agree that the shock occurred in the middle of the night. One source from Montpellier allows us to establish the time more accurately, for it specifies that the middle of the night was about the eighth hour, that is to say, about 2:00 UT. This means that the earthquake is to be dated to 3 March. Since the sources use different dating styles, the year they indicate may be 1372 or 1373. Those sources which use the Incarnation style, in which the year begins on 25 March, record the year as 1372, whereas sources from France use the style based on Easter, which fell on 17 April in 1373. The sources which habitually adopt the Nativity style, in which the year begins on 25 December, give the year as 1373.

The area of effects

During the night of 2-3 March 1373, towards 2:00 UT (half way through the night, or at the eighth hour; local time roughly coincides with that at the Greenwich meridian, i.e. UT), a strong earthquake struck the central Pyrenees. The worst affected area was Ribagorza, which lay partly in Catalan and partly in Aragonese territory. Towers and castles collapsed there, and the death toll was high. Immediately to the north, the castle and two towers at Castèl-Leon (in Val d'Aran) were severely damaged, and at numerous unidentified places in the mountainous Pyrenean area south of Toulouse a great many houses collapsed. The castles of Lleida and Santa Maria d'Oló suffered serious damage to the weaker parts of their walls. The castle of Gurb was also damaged. At Albalat de Cinca, just over the Catalan border in Aragonese territory, the church tower was damaged and collapsed. In Barcelona, the upper part of the bell-tower of the church of S.Maria del Mar collapsed, the dormitory in the convent of Poor Clares of S.Clara was damaged, as was also an arch in the church of S.Just. Elsewhere in Catalonia, the shock was felt at Cervera, Montserrat and Tortosa, the last of these being the location farthest to the south of the epicentral area.

The earthquake was also felt, though without damage being caused, along the Mediterranean coast of southern France, namely at Perpignan, Béziers and Montpellier; at Avignon in the Rhone valley; at Albi and Saint-Affrique in the Lodève area; further west at Saint-Sever; and finally, much further north, at Bordeaux, Libourne and Uzerche, this last being the location farthest to the north of the epicentral area.

Environmental effects

A local Barcelona source mentions a tsunami, recording that ships at sea were lifted up by the water. Although the writer does not tell us exactly where this happened, it is reasonable to assume that it was off the Barcelona coast.

Many springs became cloudy, but we do not know where they were.

At a place called Vila (in Val d'Aran), to the north of the epicentral area, the spring

which supplied the local people with water completely ceased to flow. Large quantities of rock fell from the Pyrenees mountains in the territory of the county of Ribagorza.

Chronology of the seismic sequence

Between 3 March and 22 September 1373, up to ten shocks or more were recorded, largely in Barcelona and French territory. The strongest shocks occurred on 3 and 23 May, and were felt over a very wide area, from Barcelona in the south to Bordeaux in the north. Although we have no information about the Ribagorza area and the Val d'Aran.

- March 3 3:00 UT: one shock was felt at Barcelona, at about the hour of matins; it was brief and less powerful than the main shock;
- March 3 6:00 UT: one shock was felt at Barcelona; it occurred at about 06:00 UT and was weak;
- March 8 Various people in Barcelona felt a double shock after 2:00 UT (after the middle of the night), and it was probably also felt at Lleida;
- March 19 Between 18:00 and 19:00 UT, there was a very violent shock at Barcelona. The shock was also felt in a number of unspecified places in Catalonia. At Perpignan it was weak and it was also weak at Montpellier;
- May 3 At about 15:30 UT, a shock described as "great" was felt at Barcelona; it was also felt at Perpignan, Montpellier and Saint-Affrique;
- May 23 Between 19:00 and 20:00 UT, there was a very strong but brief shock at Barcelona. It was also felt at Perpignan, Montpellier, Bordeaux and probably Béziers and Libourne;
- July 22 Between 19:00 and 20:00 UT a shock was felt at Barcelona;
- September 22 At about 1:30 UT (the eighth hour), a shock was felt at Montpellier.

Historical sources: an overall view

The texts of the primary, secondary and epigraphic sources are taken from Olivera *et al.* (1994a), and we add an English translation. The sources are of a strikingly large variety of types (documents, chronicles, annals, notes and diaries) and of languages (Latin, Catalan, vernacular French and Provençal). Of the thirteen documents used, ten came from central institutions (the chancery of the Kingdom of Aragon) and three from local bodies, i.e. the town councils of Cervera, Lleida and Tortosa. Six contemporary chronicles, three *notae* and an inscription complete the list of primary sources, to which must be added various 15th-17th century secondary sources.

ARCHIVAL DOCUMENTS

The research carried out by Olivera *et al.* (1994a) began at the central Catalonia archives: an examination of 62 registers in the Royal Chancery at the Archivo de la Corona d'Aragón in Barcelona led to the discovery of unpublished documents preserved in the following collections: *Castrorum*, *Curiae*, *Gratiarum*, *Secretorum*, *Sigilli Secreti*, *Speciale*, and *Peccuniae*. These documents bear witness to the first urgent action taken by king Peter IV the Ceremonious and queen Eleanor to help the worst affected places by offering sums of money and granting tax exemptions. Another source which proved to be very important was a long and detailed annotation written by a notary in the margin of a register of the acts of the Barcelona law court sessions (*Conclusions Civils*, I). Although this source was already known to the Catalan seismological tradition, it had been published only in part.

The investigations of Olivera *et al.* (1994a) moved on to outlying Catalan archives. Information was tracked down in town council records in the municipal archives at Cervera and Lleida (*Llibre de Consells*) as well as at Tortosa (*Llibre de Claveria*). Some of these sources had already been published, but only in part or else inaccurately. Nothing was gained, however, from research in the diocesan archives at Urgell, or

in the historical archives of the municipalities of Seu d'Urgell, Puigcerdà, Olot, Camprodon, Girona, Vic, Tàrraga and Balaguer.

CHRONICLES

There are original and independent reports of the earthquake in a great many contemporary records of different types: chronicles, annals, diaries, and annotations in the margins of cartularies and codices.

(i) The following contemporary chronicles from Catalonia and France have been published: the *Dietari* of Joan Torralles, ed. E.Moline i Brases (1915-17), containing information about Santa Maria d'Oló and Barcelona;

the *Chronicon Ulianense*, ed. P.De Marca (1688, col.759), containing information about Barcelona (but not about Ullà);

the *Chronicon Pontificum. Continuatio Avenionensis*, ed. E.Baluze and G.Mollat (1914), containing information about Avignon and the Toulouse area;

the *Chronique ou Livre de Memorias*, by Jacme Mascaro, ed. Ch.Barbier (1890), containing information about Béziers;

The *Chronique du Petit Thalamus*, ed. F.Pegat *et al.* (1836-40), containing information about Montpellier;

The *Chronicon Userciense*, ed. De Manteyer (1902), containing information about Uzerche.

(ii) Information about Albi, Lodève and Perpignan comes respectively from an annotation in a cartulary preserved in the archives of the municipality of Albi (published in Vidal 1902); from an annotation at the end of a necrology from the cathedral of St-Nazaire in Béziers, inserted by an unidentified contemporary ecclesiastic who was probably living in the Lodève region at the time of the earthquake (ed. C.Devic and J.Vaissete 1879); and from an annotation in the margin of a calendar of solemn feasts in the *Llibre vert minor*, a codex of privileges relating to the town of Perpignan (ed. Mengel 1909, p.68).

(iii) There are also some 15th, 16th and 17th century sources which, although late, contain information considered to be reliable in that it probably derives from lost contemporary documents. They include the *Petite Chronique de Guyenne*, ed. G.Lefevre-Pontalis (1886), containing information about Libourne; the *Crònica del racional de la ciutat de Barcelona* (ed. 1921), the *Anales de la Corona de Aragón*, written by the historian Jerónimo de Zurita between 1562 and 1579 (ed. A.Canellas, 4, 1973), the *Rúbriques de Bruniquer* or *Ceremonial dels Magnífics Consellers*, edited by Esteve Gilabert Bruniquer, a local authority employee at Barcelona (ed. Francesch Carreras Candi i Bartomeu Gungalons, V, 1912-16), information about the monasteries of Saint-Sever and Saint-Affrique recorded in Du Buisson (1876), and historical notes by Andre Maurel recorded by De Gaujal (1859).

INSCRIPTION

There is a record of the earthquake in an inscription:

■ - Bordeaux: on a portal of the church of St-Eulalie. It dates to 1375 and was sculpted on the orders of a certain Ramon Debu. The inscription itself has been lost, but its text has survived in transcriptions by two 19th century writers (Bernadau 1844, p.335; Augier 1887, p.XV). It is interesting to note that an inscription rarely records an earthquake at a place well outside the area of maximum effects. Inscriptions about earthquakes nearly always record the restoration or reconstruction of buildings which have been damaged or destroyed.

Survey of effects of the nine earthquakes at individual locations

Set out below is a description of earthquakes effects and the reactions of the authorities at the locations and areas concerned. Only the most significant 14th century sources are provided, together with those later chronicles which gain in reliability and importance because they are based on lost earlier sources.

March 3 (2:00 UT) **Ribagorza area** (Spain)

Many towers and castles collapsed in the area. Large rocks became detached from mountains in the Pyrenees, and there was a high death toll.

The source is the annals of Jerónimo de Zurita, a chronicler of the Crown of Aragon, whose work in 30 books was published between 1562 and 1579. He consulted documents in the principal royal archives, but never actually names the sources used, with the result that it has been impossible to identify them. The text is in Olivera *et al.* (1994a, p.75): "On the second day of the month of February 1373, during the night, there was so great an earthquake that large rocks fell from the Pyrenees mountains in the county of Ribagorza, and many people were killed in the mountains and plains and many towers and castles collapsed, and great damage was suffered in those mountains".

A 2 del mes de febrero de 1373, siendo de noche, hubo tan grande terremoto que cayeron grandes peñascos de los montes Pirineos, en el condado de Ribagorza, y murieron muchas gentes en las montañas y en la tierra llana, y se hundieron muchas torres y castillos, y fué muy grande el daño que se recibió en aquellas montañas.

Although the author dates the earthquake to 2 February 1373, Olivera *et al.* (1994a) think it was actually the earthquake of 3 March and not an earlier shock, as Fontserè and Iglésies (1971) had supposed.

Castèl-Leon (Val d'Aran, Spain)

The castle was badly affected: one tower collapsed and another was damaged.

The sources are two documents from the Royal Chancery, dated respectively 9 April and 11 November 1373 (Archivo de la Corona d'Aragón, Barcelona, *Cancillería, Castrorum*, reg.1466, fol.108r.; fols.113r.-v.; the texts are in Olivera *et al.* 1994, pp.97, 105). In the first document, king Peter IV the Ceremonious orders the repair of damage to the castle and its towers. The second document again refers to damage to the castle, and records the king's wish that the settlement should be rebuilt because of its military importance in controlling access to Catalonia from France. There is no specific reference to an earthquake as the cause of the damage in either source, but it is reasonable to include this location amongst those struck by the shock of 3 March 1373, because it is not far north of the epicentral area (Ribagorza), and especially because it is close to Vila, where we have evidence of environmental effects specifically attributed to the earthquake. The first document states:

"[...] We have received your message from our procurators, to the effect that the tower at the main gate of the castle of Castèl-Leon has collapsed, as well as a large part of the main tower, with the result that the castle cannot be defended in its present state [...]. Given at Barcelona, under our common seal, on 9 April in the year 1373".

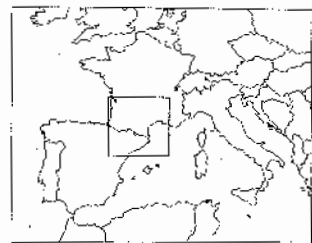
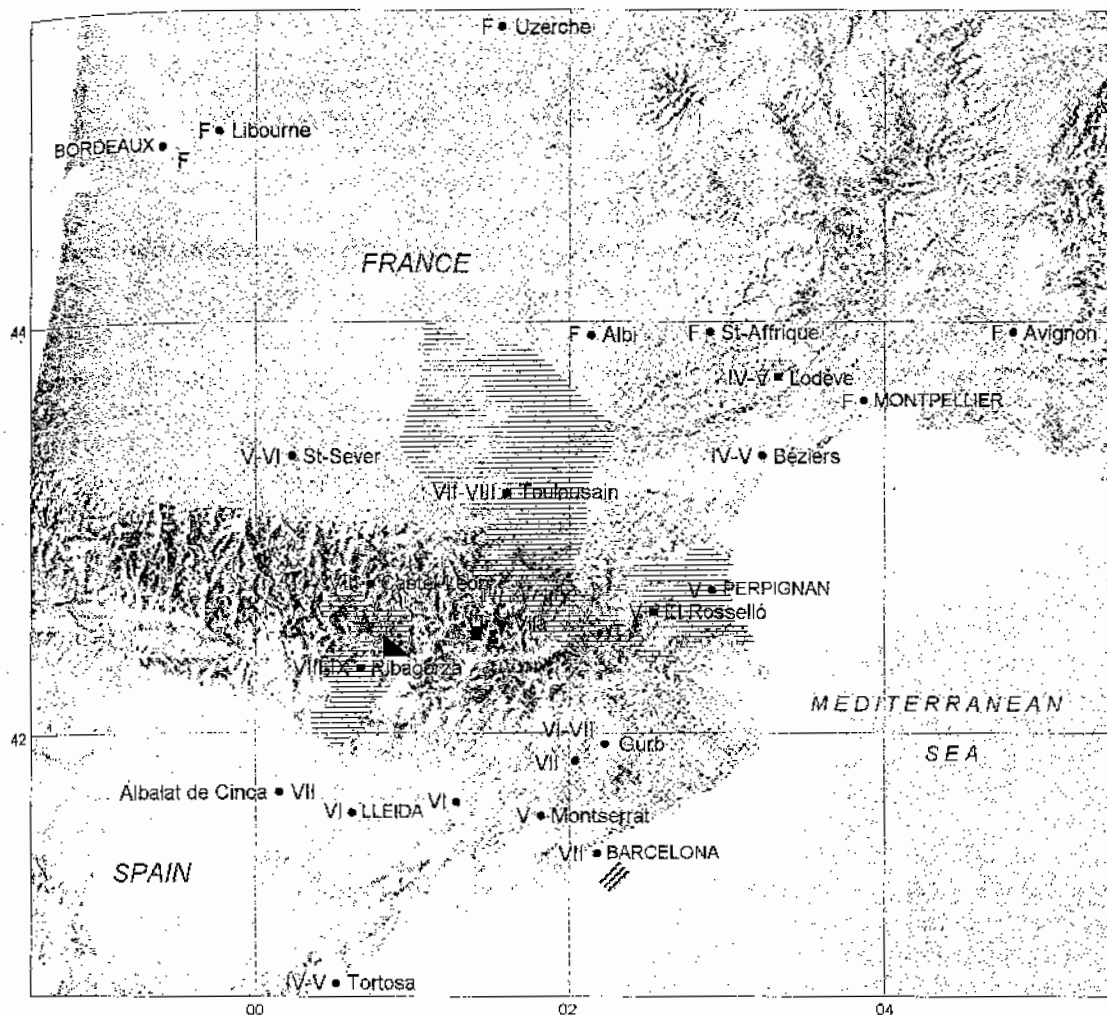
[...] Entès havem per los procuradors que ns havets trameses que la torra del portal del castell de Castell-leó és cayguda e .I. gran troç de la torra major, axí que lo castell en la manera que està huy no.s poria defendre [...].

Dada en Barchinona, sots nostre segell comú, a IX dies d'abril de l'any MCCC. LXXIII.

The second document reads:

"Peter [...]. To our faithful Michael Mulnerius, money-changer and citizen of Lleida, health and grace.

As you know, we have made written arrangements to grant to our dear counsellor and majordomo of our dear and illustrious eldest son Francisco of San Clemente, knight and castellan of Castel-Leon in Val d'Aran, one hundred *lliuras* of *jaqueses*, for repairs to the said castle, and this sum of money is about to be received from the first-fruits of the diocese of Ilerda and Osca, but we have recently been told by the said Francisco that he has been and is quite unable to obtain these hundred *lliuras* from the collectors of these first-fruits [...]. We wish to give this grant precedence over all other grants



1373
March 3

fig. 95 Effects of the earthquake which occurred on 3 March 1373 (02:00 UT). The hatched areas indicate the provinces in which the sources record damage effects without specifying the localities concerned.

already arranged or to be arranged, and we tell and order you willingly and promptly to give the said one hundred *lliuras* of *jaqueses* to the said castellan, or whoever he may wish to act on his behalf, giving the collectors a receipt for the sum involved, and obtaining from the said castellan the document concerning the said grant and the receipt together with this other one. We are therefore sending the master accountant of our court, or another, to whom you shall account for the above matters, and he will certify that the said one hundred *lliuras* given to you have been forwarded. Given at Barcelona on 19 November in the year 1373 since the birth of Our Lord".

Petrus [...] Fideli nostro Micheli Mulnerii, campsori et civi Ilerde. Salutem et gratiam. Cum nos, sicuti scitis, cum diversis literis nostris assignaverimus dilecto consiliario et maiordomo incliti ac magnifici primogeniti nostri, Ffrancisco de Sancto Clemente, militi, castellario Castrileonis, Vallis Aranni, centum libras iaccensium, pro reparatione dicti castri, in et super quantumque peccunie quantitate ex primiciis diocesis Ilerdensis et Oscensis quomodocumque proventura, et percepimus noviter per dictum Ffranciscum quod dictas centum libras a collectoribus ipsarum primiciarum habere, ut dicit, ullo modo non potuit neque potest [...]. Nosque velimus assignacionem predictam omnibus

aliis assignacionibus factis et faciendis anteferri, vobis dicimus et mandamus de certa sciencia et expresse quatenus dictas centum libras iaccensium eidem castellario seu cui voluerit loco sui, de peccunia ipsa, exsolvatis, faciendo de eis collectoribus ipsius apocam de recepto, et recuperando utique a dicto castellario litteram assignacionis predictae et apocam cum presenti. Quoniam nos mandamus magistro rationali curie nostre aut alii cuicumque a vobis compotum de predictis audituro quod dictas centum libras in vestro compoto, vobis restituendis cutelas predictas, recipere non posponat. Datum Barchinone, XXIX die novembris anno a Nativitate Domini .MCCC.LXX. tercio.

Vila (Val d'Aran, Spain)

The earthquake caused an interruption to the town's water supply.

The source is a document dated 18 April 1375 (Archivo de la Corona d'Aragón, Barcelona, *Cancillería, Gratiarum*, reg.927, fol.111r.), in which king Peter IV the Ceremonious authorises the townspeople to use the water supply to the nearby village of Montecorbau, in order to cope with the emergency. The text is in Olivera *et al.* (1994a, p.113):

"Peter, [...]. Since we have received a humble petition from you, consuls and leading men of the town of Vila, to the effect that the great earthquakes which in divers ways have occurred in that town and elsewhere in the world, have caused the water in the spring which normally gushes forth and flows there continuously, to dry up and completely cease to flow, so that you have been deprived of the benefit of that spring, we therefore deign to make the following concession. We accept your petition, and by means of these presents we grant and allow you full permission, without fear or prejudice to the rights of others, to divert water from the Montecorbau stream for your own use, by whatever route seems to you most suitable, and in such a way as to fully replace your losses, as shall be assessed by two leading men, one from each of the above-mentioned places. We send this to all and sundry our officials and subjects, present and future, so that they may closely observe and maintain this concession and all and sundry the provisions contained in it, and may see that it is closely observed and maintained, in order to remedy all the damage you have suffered. To this effect we issue this document and authenticate it with our seal.

Given at Ilerda on 18 April in the year 1375 since the birth of Our Lord".

Nos Petrus [...]. Eo quia, pro parte vestri, consulum et proborum hominum loci de Vellano, fuit nobis humiliter supplicatum ut, cum fons aque qui in loco predicto continue solebat defluere et labi, propter magnos terre motus qui in villa ipsa, sicuti in aliis mundi partibus, [acciderunt] diversemode, fuerit exsiccatus et totaliter aqua inde fluere cessaverit, vobis, tanquam privatis beneficio ipsius fontis, dignaremur concessionem facere infrascriptam. Propterea nos, supplicacione ipsa benigne admissa, tenore presentis, concedimus et licenciam plenariam vobis impertimur quod, absque metu pene, possitis et vobis liceat, absque iuris periudicio alieni, ducere aquam que labitur per rivos de Montecorballo ad locum predictum de Villano, ad vestrum proprium usum, per illas partes per quas vobis magis expedientes videatur, vobis tamen satisfaciendis integre dampna passis, ad cognitionem duorum proborum hominum, scilicet, unus utriusque locorum predictorum. Mandantes huius serie universis et singulis officialibus et subditis nostris, presentis et futuris, quatenus vobis concessionem istam et omnia et singula in ea contenta teneant firmiter et observent tenerique et observari faciant inconcusse, vobis tamen satisfaciendis dampna passis. In cuius rei testimonium presentem vobis fieri et sigillo nostro iussimus communiri. Datum Ilerde, XVIII die aprilis anno a Nativitate Domini MCCCLXXV.

The Toulousian region (France)

There were shocks throughout almost the whole of the spring of 1373, causing houses to collapse and a great deal of other damage.

The source is a pontifical chronicle in Latin (*Chronicon Pontificum. Continuatio Avenionensis*) about the life of Gregory XI (1371-1378). It is in the original for the

period from 1370 onwards, and was compiled between 1394 and 1398 by a writer from the Toulouse area who lived at Avignon from 1370 onwards. It wrongly dates the earthquake to 1371. The text was published at the end of the 17th century by Baluze, and republished in a revised edition by Mollat in 1914 (I, p.416). It is also in Olivera *et al.* (1994a, p.124):

"1371... In that same year, throughout almost the whole of the spring, there was an earthquake [...] and its intensity was greatest by far in the region of Toulouse. It reduced many places to ruins and caused houses to collapse".

1371 ... Eodem anno quasi toto tempore vernali fuit terraemotus [...] et in partibus Tholosanis permaximus. Ex quo perierunt loca multa, et habitationes corruerunt.

Santa Maria d'Oló (Spain)

A tower in the castle was damaged. The source is the diary of Joan Torralles, who experienced the earthquake himself. His work has come down to us in an early 16th century transcription and has been published in Moline i Brasses (1915-17, p.214). The text is in Olivera *et al.* (1994a, p.72):

"In the year 1373, on 2 March, the second day of Lent, after the midnight hour, there were strong and massive earthquakes throughout Spain, so that churches, castles and dwellings were damaged and collapsed [...] and in the castle at Oló a piece of the castle wall tower collapsed, and the terrace split open and many other places collapsed".

En l'any mil CCCL[X]XIII, a .II. de març, e era lo segon dia de coresma, passada hora de mitja nit, venc fort e poderós terratrèmol per tota Spanya, que sglesies, castells e alberchs se feneren e se enderrocaren [...] e en lo castell d'Oló se enderrocà .I. tros de la torra de les parets del castell, e lo puig se obri e moltes de altres llocs se enderrocaren.

There is a mistaken place name in Fontserè and Iglésies (1971), where the castle of Oló is confused with that of Olot.

Gurb (Spain)

The castle was damaged. The source is a document dated 18 February 1374 (Archivo de la Corona d'Aragón, Barcelona, *Cancillería, Gratiarum*, reg.925, fols.118v-119r.), in which king Peter IV the Ceremonious grants an extra six months for the completion of repair work begun by William of Argentona, a royal captain. The damage had resulted not only from the earthquake but also from other unspecified causes. The text is in Olivera *et al.* (1994a, p.111):

"Peter, [...]. To our beloved knight, William of Argentona, health and grace.

The syndics and leading men of the frontier castle of Gurb, in the vicariate of Osona, have humbly petitioned us, to the effect that you, a short time ago, in your capacity as captain in the town of Vic and the vicariate of Osona, because the castle was in need of repair, ordered those who sought the repairs, under severe penalties, to carry out and complete such repairs to the said castle by next Easter, and to do all the necessary work; but since they declare that it is impossible for them to carry out these repairs in such a short time, because they are so substantial, both because of the damage to the castle caused by the earthquake which struck these same places last year and for other reasons, we therefore deign by special grace to extend the time limit. By means of this our present letter, therefore, we kindly accept their petition, and we extend or increase the said time limit to the said petitioners from the said feast of Easter to the next feast of St. Michael; on condition that, in the meantime, the petitioners do not cease working or having work carried out on the said castle. By means of this present, we order you and all our officials who need to be informed of these things, to observe and cause to be observed this our extension and increased time limit granted to the said petitioners, and not to contravene it for any reason. Given at Barcelona on 18 February in the year 1374 since the birth of Our Lord.

Petrus [...]. Dilecto nostro Guillelmo de Argentona, militi. Salutem et gratiam. Pro parte sindicorum et proborum hominum termini castris de Gurbo, vicarie Ausone, fuit nobis humiliter supplicatum ut, cum vos nuper, ut capitaneus per nos deputatus in civitate Vici et in vicaria Ausone, eo quia dictum castru reparationem indiget, iniunxistis ipsis supplicantibus, cum magnis penis, ut ipsam reparationem dicti castru et opera in eodem fienda facere habeant et complere hinc usque ad festum Pasce proxime venturum; et hoc, ut asserunt, sit eis impossibile, videlicet: quod ipsa reparacio infra tam breve tempus fiat, propter magnam reparationem qua indiget ipsum castrum, tam occasione dirucionis que facta extitit in eodem propter terre tremutum qui anno proxime lapso accidit in ipsis partibus, quam aliis de causis, dignaremur eis dictum terminum de speciali gracia prorogare. Nos igitur, eorum supplicacioni benigne annuentes, cum presenti littera nostra, predictum terminum eisdem supplicantibus, a dicto festo Pasce usque ad festum Sancti Michaelis proxime venturum, prorogamus seu etiam elongamus, ita tamen quod, in ipso intermedio, iidem supplicantes non cessent operari seu operari facere in ipso castro. Mandates vobis, per hanc eandem, et quibusvis aliis officialibus nostris ad quos hec pertinere nosceantur, quod huiusmodi prorogacionem seu elongamentum nostrum dictis supplicantibus per dictum tempus observetis et observari faciatis et non contraveniatis aliquam racionem. Datum Barchinone, XVIII die febroarii anno a Nativitate Domini millesimo CCC° LXX° quarto.

Barcelona (Spain)

The upper part of the bell-tower of the church of S.Maria del Mar collapsed (the tower had only recently been built); the convent of Poor Clares of S.Clara was rendered unfit for use and threatened to collapse; an arch was damaged at the church of S.Just, and a large piece of stone fell off it. No building in the city collapsed. The most important sources, providing evidence of damage to buildings in the city, are an annotation in the margin of a register of Barcelona court acts, an annotation in the margin of a Barcelona local authority codex, two documents from the Royal Chancery, dated 2 September and 12 December 1373, and a document from the Royal Treasury dated 3 March 1374.

The annotation written during the days immediately following the earthquake by a notary called Pere Vidal and included beside the report of the two court sessions at Barcelona of 28 February and 5 March, was published in part by Madurell (1949, p.114). The whole text is in Olivera *et al.* (1994a, p.68):

"The following day, Wednesday 2 March [1373], at the time when the monastery of the city of Barcelona rang the midnight hour, there was a great earthquake both on land and at sea. It was terrifying, and indeed the great ships at sea were lifted high on the water, not in the way they are usually thrown about in sea storms, but with ships and water rising up together. On land, the top fell from the bell-tower of S.Maria del Mar in Barcelona. No other bulding collapsed in that city, thanks be to the Almighty, but a number of castles in the Principality of Catalonia were shaken at that time and suffered partial destruction. And this happened on both sides of the Pyrenees at the same time. [...] This dreadful event lasted as long as it takes to walk 300 or 400 steps".

Subsequens dies, mercurii, fuit secunda marcii et, in hora qua in monasteriis civitatis Barchinone pulsabatur ad mediam noctem, fuit magnus tremor terre, tam in terra quam in mari, et terribilis valde, nam in mari naues magne que erant elevabantur ab aqua in altum, non per modum quo solent conturbari ex assueta fortuna seu tempestate maris, set erigendo aquam cum navibus simul in altum. In terra cecidit sumitas cloquerii Sancte Marie Maris Barchinone. Aliqua alia edificia in dicta civitate non ceciderunt de quo laudetur Altissimus sed diversa castra Principatus Cathalonie fuerunt, illa hora, contrafacta et in aliqua sua parte diruta. Et hoc, eadem hora, evenit tam ultra quam citra Pirineos montis [...]. Duravit dicta terribilitas per tantum temporis spatium quantum quis posset ire continue .CCC. vel .CCCC. passus.

The annotation in the margin of a Barcelona municipal codex, published in Battelli (1987, p.345), is also in Olivera *et al.* (1994a, p.70):

“On Thursday 3 March in the year 1373, at the midnight hour, there was a great earthquake at the city of Barcelona. It lasted for two hours, and the top of the bell-tower at the church of S.Maria del Mar fell down [...] and a large piece of stone fell from the arch in front of the high altar in the church of S.Just”.

Dijous ora de miganit, a tres de març del an M.CCC.LXX. tres, fo fet gran terratrèmol en la Ciutat de Barcelona e durà dues ores e quaech lo cap del cluger de les esq[u]eles de la esgleya de sancta Maria de la Mar [...] e quech una gran pedra del arch de la esglea de sent Iust, qui és denant l'altar major de sant Just.

On 2 September 1373, queen Eleanor had funds allocated for repairs to the convent of Poor Clares of S.Clara (Archivo de la Corona d'Aragón, *Cancillería, Speciale*, reg.1582, fols.61v.-62r.). The document in question (published in Olivera *et al.* 1994, p.104) makes no explicit reference to an earthquake, but the cause of the damage is specified as such in the text of another Royal Chancery document dated 12 December 1373 (Archivo de la Corona d'Aragón, *Cancillería, Peccuniae*, reg.1356, fols.123r.-123v., published in Olivera *et al.* 1994, p.107). It refers to the same building and the same allocation of funds. The first document reads:

“Eleanor [...]. To our faithful counsellor and treasurer Berenguer de Relat. Health and grace. We tell and order you to give and pay to the venerable abbess of the convent of nuns minor of Barcelona of the order of St.Clare two thousand Barcelona *sous* from court money which you have or will have, for we grant this sum to that abbess and the community of that convent for the love of God and to aid the work required in the convent dormitory, which is in danger of major collapse. Given at Barcelona on 2 September in the year 1373 since the birth of Our Lord, under our seal. William, secretary”.

Alienora etc. [...] Ffidei consiliario et thesaurario nostro Berengario de Relato. Salutem et gratiam. Dicimus et mandamus vobis quatenus, de peccunia curie nostre que est vel erit penes vos, detis et solvatis venerabili et religiose abbatisse monasterii sororum minorum Barchinone, ordinis Sancte Clare, duos mille solidos barchinonenses; quos eidem abbatisse et conventui dicti monasterii dare providimus, amore Dei, in auxilium operis quod necessario fieri habent in domo dormitori monasterii antedicti,

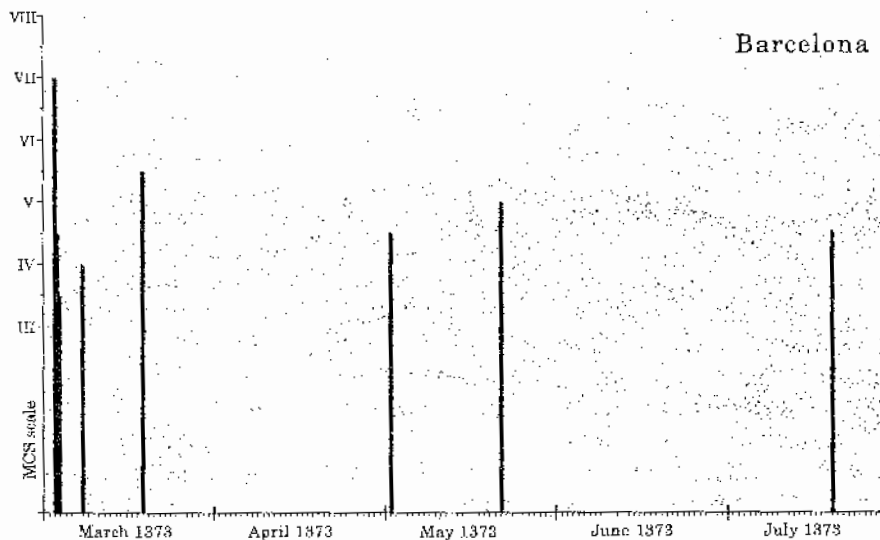


fig. 96 The eight shocks felt at Barcelona from 3 March to 22 July 1373 (in the background: map of the city from Braun and Hohenberg 1572).

que penitus minatur ruinis. Et recuperetis a dicta abatissa in solucione presentem cum apocha de soluto. Datum Barchinone, secunda die septembris anno a Nativitate Domini M^oCCC^oLXX^oIII^o sub nostro sigillo. Guillelmus secretarius.

The second document reads:

"We, Peter [...]. For the love of God and in order to assist you, pious and beloved abness of the convent of S.Clara in Barcelona, in bearing the cost of work on the convent dormitory, which is in such danger of collapse that you cannot sleep safely and comfortably in it because of the earthquake which, for our sins, has shaken this region so severely. We inform you by means of this present that we grant to you the sum of two thousand Barcelona *sous*, out of money earmarked for charity. By means of this letter we order our beloved Arnald of Carbasino, who is in charge of charitable funds, to grant and pay to you or your chosen representative the said two thousand *sous* out of all the said charity money which is or shall be in his care, and after payment has been effected he shall obtain from you this present payment receipt. And by means of this letter we order the chief finance officer of our court or whoever may have been designated by the charity office to receive this communication, to receive and record in his accounts the above-mentioned sum, and this letter with the above-mentioned receipt is to be returned to him. Given at Barcelona on 12 December in the year 1373 since the birth of Our Lord. King Peter".

Nos Petrus [...]. Pietatis intuitu et in auxilium expensarum fiendarum per vos, religiosam et dilectam abbatissam monasterii Sancte Clare Barchinone, in conventum ipsius monasterii, in opere dormitorii dicti monasterii, quod, ratione terre motus qui peccatis demerentibus in hiis partibus nimis invaluit, adeo ruinam minatur, quod in ipso dormire tute seu comode non valetis; duos millia solidorum barchinonensium vobis huius serie impertimur, quos vobis assignamus in et super pecunia nostre elemosine assignata. Mandantes per hanc eandem dilecto elemosinario nostro Arnaldo de Carbasino quod, de quavis pecunia dicte elemosine assignata que penes ipsum est vel erit, tribuat et exsolvat vobis aut cui volueritis loco vestri dictos duos millia solidorum, recuperando a vobis, facta solucione, presentem apocham de soluto. Nos enim per hanc eandem mandamus magistro rationali curie nostre aut cuivis alii a dicto elemosinario comptum audituro quod, in eius compoto, recipiat et admittat quantitatem predictam, ipso ei restituente literam hanc cum apocha supradicta. Datum Barchinone, .XII. die decembris anno a Nativitate Domini MCCCLXXIII. Rex Petrus.

The annotation about payment of the grant made by the queen on 2 September 1373 to the monastery of S.Clara is recorded in a treasury ledger at 3 March 1374 (Archivo de la Corona d'Aragón, *Mestre Racional*, reg.503, fol.60v.).

There are references to earthquake effects at Barcelona in other briefer and less important sources. They are: the *Chronicon Ulianense* and the diary of Joan Torralles, both of which are contemporary with the event; the 15th century *Crònica del racional de la ciutat de Barcelona* and the *Rúbriques de Bruniquer* or *Ceremonial dels Magnífics Consellers*, a work compiled by a Barcelona official in the years 1608-14. These last two works provide similar accounts and refer to processions held between Monday and Wednesday in the week after the earthquake. We set out below only the evidence provided by Joan Torralles: his work has come down to us in an early 16th century transcription, and has been published in Moline i Brases (1915-17, p.214). The text is in Olivera *et al.* (1994a, p.72):

"In the year 1373, on 2 March, the second day of Lent, after the midnight hour, there were strong and mighty earthquakes throughout Spain. Churches, castles and houses were damaged and collapsed, and the crown of the bell-tower of S.Maria del Mar in Barcelona collapsed [...]. And many active springs became cloudy. And the earthquake seemed to be in the sea, and many times it was so in the next two years".

En l'any mil CCCLX[X]III, a .II. de març, e era lo segon dia de coesma, passada hora de mitja nit, venc fort e poderós terratrèmol per tota Spanya, que sglesies, castells e alberchs se feneren e se enderrocaren e lo cloquer de Sancta Maria la Mar, de Barchinona, se enderrocà de la garlanda amunt [...] E moltes fonts viues se enterboliren. E semblantment fou en la mar lo terratrèmol, e moltes voltes ne feu despuys dins dos anys.

Lleida (Spain)

The castle chapel was damaged. The sources are two manuscript documents, the first of which is a record of a meeting of the town council on 3 March 1373, the morning after the earthquake (Arxiu Municipal de Lleida, *Llibre de Consells*, fol.57r.), while the second is a document from the Royal Chancery dated 23 August 1373 (Archivo de la Corona d'Aragón, Barcelona, *Cancillería, Curiae et Sigilli Secreti*, reg.1088, fol.38v.). The text of the first document, which refers to communal religious rites and fasting, is in Olivera *et al.* (1994a, p.93):

"[...] in view of the fact that there was a great earthquake last night [...] it was decided that there should be professions (of faith), prayers, almsgiving and fasting [...]"

[...] saben com en la nit passada hà fet gran terratrèmol [...] si conseyllaven que se'n fees professons, oracions, almoynes e dejunis [...].

The text of the second document, which refers to damage at one of the residences of Peter IV the Ceremonious, is in Olivera *et al.* (1994a, p.102):

"The king: In another letter we have written a reply to the letter you sent us about the work to repair earthquake damage to the chapel in the castle at Lleida [...].

Given at Barcelona, under our secret seal, on 23 August in the year 1373. King Peter.

Lo rey: Per altra letra vos havem escrit responent a la letra que.ns haviets tramesa sobre.l fet de obrar e reparar lo dampnatge que per lo terratrèmol era estat fet en la capella del castell de Leyda [...].

Dada en Barchinona, sots nostre segell secret, a XXIII dies d'agost de l'any MCCCLXXIII. Rex Petrus.

Albalat de Cinca (Osca, Spain)

The bell-tower was badly damaged. The source is a Royal Chancery document dated 25 June 1373, in which king Peter IV the Ceremonious renounces a tax on condition that the sum concerned is used to rebuild the bell-tower (Archivo de la Corona d'Aragón, Barcelona, *Cancillería, Sigilli Secreti*, reg.1239, fol.65r.-v.). The text is in Olivera *et al.* (1994a, p.100): "We Peter, by the grace of God, [...]. Since it is our wish that the bell-tower at Albalat de Cinca, which was recently damaged by the powerful earthquake in that area, should be repaired and restored to its former state, and since the people are also in a state of poverty and wretchedness because their town was burned and laid waste by the bands of soldiers who recently passed that way, to the humble petition which our illustrious and noble Peter, count of Urgell and viscount of Aggerensi, our beloved familiar and nephew [...]. Given at Barcelona, on 25 June in the year 1373 since the birth of Our Lord. King Peter".

Nos Petrus, Dei gratia, [...]. Volentes dare locum ut campanile loci de Albalato riparie Cinque, quod nuper, occasione terre motus nimium in partibus illis vigentis, passum est ruinam, refici valeat ac statum deduci in primigenium, nec non compacientes inopie et pauperitati hominum dicti loci qui, per gentes armigeras que dudum per ipsum locum transitum fecerunt, combustus extitit ac etiam disraubatus; ad humilem supplicacionem nobis factam per egregium et spectabilem nostrum Petrum, comitem Urgelli et vicecomitem Aggerensis, domicellum, nepotem nostrum carissimum. [...]. Datum Barchinone, XXV dies iunii anno a Nativitate Domini M°CCCLXXIII°. Rex Petrus.

Cervera (Spain)

The town council meeting of 9 March 1373 was not held in the council chamber, perhaps because it was not in a fit state to be used. Communal religious rites were ordered. The source is a document drawn up by the town council, which held an extraordinary meeting on 9 March 1373 (Arxiu Municipal de Cervera, *Llibre de Consells*, 1373, fols.12r.-v.). Part of the text is transcribed, with occasional inaccuracies, in Fontserè and Iglésies (1971), and the whole is published in Olivera *et al.* (1994a, p.64):

"Also, [the councillors] order that in honour of God and the Virgin Mary and the whole court of Heaven, a prayer shall be said each night, after the people have returned to the town, so that God, in his mercy, may decide to bring this earthquake to an end, and so the said prayer shall be said by everybody together [...]. Also, for the whole of this week, a solemn profession [of faith] shall be made every day".

Item ordonaren que, en honor de Déu e de la verge Maria e de tota la cort celestiall, que cascuna nit, après que les gens se'n seran entrades, sie feita general oració, per ço que Déu, per la sua mercè, vuylle fer cessar aquest terratrèmol, e, per ço que la dita oració se fase per tuyt comunament [...]. Item que per tota aquesta setmana sie feita cascun dia profesó solemniat.

Saint-Sever (France)

The church and monastery were severely shaken. The very late source is a history of the monastery of Saint-Sever written by Pierre Daniel Du Buisson about 1681, but not published until 1876 (I, pp.166, 276). The writer claims to have acquired his information from two sources: a calendar of saints from the abbey of Saint-Sever (probably a contemporary annotation — now lost), and notes by Bernard d'Abadie, bishop of Aire in the late 15th century (Saint-Sever was then in his diocese). He probably obtained his information from the above calendar. The text is in Olivera *et al.* (1994a, p.128):

"In the year 1372, the church, like the monastery, was so badly shaken by a powerful earthquake, on 2 March, in the middle of the night, that it was almost reduced to ruins".

Anno 1372 concussa valide cum monasterio fuit ecclesia a vehementissimo terrae motu, die secunda martis, nocte media, ita ut pene fuerit concussionem eversa.

"In the year 1372, on 2 March, at about midnight, there was so severe an earthquake at St-Sever that it seemed likely that the monastery would collapse and be reduced to ruins. This was written in a book of saints, and I also found it in notes by Bernard d'Abadie".

Anno 1372, die 2 martis, circa media noctem, factus est terraemotus in Sancto Severo, ita quod videretur monasterium cadere et penitus a fundamentis everti: hoc scriptum sic fuit in hagiolo, et in notis Bernardi d'Abadie relatum inveni.

The earthquake is dated in the Incarnation style.

The Lodève area (France)

The earthquake was prolonged and caused strong shaking there. The source is an annotation at the end of a necrology from the cathedral of St-Nazaire at Béziers by an unknown contemporary ecclesiastic who was probably living in the Lodève area at the time of the earthquake. The text is published in Devic and Vaissete (1979, cols.260-1), and also in Olivera *et al.* (1994a, p.123):

"In the year 1373, on Ash Wednesday, 2 March, the fourth day of the week, there was an earthquake throughout the Lodève area. It occurred after midnight and lasted for a quarter of an hour, and there was such a noise in the streets that it seemed as though carts were being driven around the town".

Anno MCCCLXXIII, die cinerum, quae fuit IVa feria et die IIa martii, fuit terrae motus in toto Lodevesio et venit ultra mediam noctem et duravit per IVam partem unius horae,

et erat tantus strepitus in carreriis, quod videbantur quadrigae per villam discurrentes.

A slight ambiguity remains as regards the reference to a town at the end of the text. One naturally thinks of Lodève, but it might be Béziers, since the earthquake was also felt there.

Albi (France)

The earthquake was felt. The source is an annotation in Provençal in a cartulary in the archives of the municipality of Albi. It appears amongst annotations made between 1333 and 1483 by contemporary writers. The text was published in Vidal (1902, p.454), and is also in Olivera *et al.* (1994a, p.126):

"On 13 July in the year 1372, there was a great storm at Albi [...] Also, on 2 March, the first day of Lent, [...] there was an earthquake".

L'an MCCCLXXII a XIII del mes de julh. foc ad Albi la gran tempesta [...] Item l'an dessus lo segon jorn de mars que fo lo premier dia de careme [...] fo lo terra tremol.

The earthquake is dated in the Incarnation style.

Avignon and its surroundings (France)

The earthquake was felt. There were shocks almost throughout the spring of 1373. The source is the *Chronicon Pontificum. Continuatio Avenionensi*, a pontifical chronicle in Latin about the life of Gregory XI (1371-1378). The source is in the original for the period from 1370 onwards, and was compiled between 1394 and 1398 by an author who was a native of the Toulouse area and lived at Avignon from 1370 onwards. The earthquake is wrongly dated to 1371. The text was published by Baluze at the end of the 17th century, and was republished in a revised edition by Mollat in 1914 (I, p.416). It is also in Olivera *et al.* (1994a, p.124):

"1371. In that same year, throughout most of the spring, there was an earthquake at Avignon and its surroundings".

1371. Eodem anno quasi toto tempore vernali fuit terraemotus in Avinione et locis circumvicinis.

Béziers (France)

The earthquake is described as "great". The source is the chronicle in Provençal by Jacme Mascaro, a contemporary local chronicler. The text was published by Barbier (1890, p.66), and is also in Olivera *et al.* (1994a, p.122):

"The year 1373 [...] In the above year, on 2 March, the first Wednesday in Lent, there was a great earthquake half way through the night in the whole of this area".

L'an MCCCLXXIII [...] L'an sobredig a II jorns del mes de mars lo premier dimercres de carema a miega nueg foug gran terratremol per tot aquest pais.

Bordeaux (France)

The earthquake was felt. The source is a 1375 inscription formerly on a portal of the church of St-Eulalie in Bordeaux. The inscription was lost in the early 20th century when the door was demolished, but it had been transcribed by two 19th century writers (Bernadau 1844, p.335; Augier 1887, p.XV). The text is published in Olivera *et al.* (1994a, p.50):

"In the year of Our Lord 1372 the earth shook on 3 March, which was the first day of Lent, at the midnight hour [...] in the year 1375 of O(ur) L(ord) [...]. And Ramon Debu had the portal made here".

Anno Domini M CCC LXXII que la tera tremblet lo tert jorn de mart que fo lo prumey jorn de careyme en la hora de meja nuyt [...] en l'an de N.S. M CCC LXXV [...]. E aqui an Ramon Debu a fi fa lo portau.

The earthquake is dated in the Incarnation style. The first day of Lent was actually 2 March.

Libourne (France)

The earthquake was felt. The source is the *Petite Chronique de Guyenne*. This chronicle covers the period 1101-1442, and was compiled by someone living at Libourne in the first half of the 15th century. Since information about the period 1333-1406 comes from lost sources from Bordeaux and Libourne, it is difficult to establish which of the two places is being referred to in the chronicle as having experienced the earthquake. The text was published by Lefevre-Pontalis (1886, p.63), and is also in Olivera *et al.* (1994a, p.130):

"In the year 1373 the earth shook. It happened at the midnight hour".

L'an. M.CCC LXXIII. tremblet la tera. E a la hora de meya nuyt.

Montpellier (France)

The earthquake was prolonged. The source is a chronicle of the town of Montpellier, in Provençal, to be found in a cartulary known as the *Petit Thalamus*. It covers the period 1088-1426, and was compiled from the second quarter of the 14th century by various contemporary writers. The text was published by Pegat *et al.* (1836-40, pp.389-90), and is also in Olivera *et al.* (1994a, p.121):

"The year of Our Lord 1372 [...] Also, on Ash Wednesday, which was 2 March, at about the middle of the night, at the eighth hour of the night, there was a general earthquake throughout almost the whole of Christendom, and it lasted as long as it takes to recite a *Miserere*".

Lan de Nostre Senhor MCCCLXXII... Item lo dimecres de las Cenres que era lo segon jorn de mars apres mieja nueg entorn ad VIII horas de nueg fo general terra tremol cays per tota crestiandat e duret per espasi de I miserere mei.

The earthquake is dated in the Paschal style. In 1373, Easter fell on 17 April. The shock must have lasted about 65 seconds.

Montserrat (Spain)

The earthquake was felt in both the upper and lower parts of the town. The source is an annotation written by the notary Pere Vidal in the margin of a register of the acts of the Barcelona court. The text appears alongside the reports of the two sessions of 28 February and 5 March, and was published in part by Madurell (1949, p.114). It is published in its entirety in Olivera *et al.* (1994a, p.68):

"The following day, Wednesday 2 March [1373], at the time when the monastery of the city of Barcelona rang the midnight hour, there was a great earthquake [...] And this happened on both sides of the Pyrenees at the same time, and it occurred in both the upper and lower parts of Montserrat".

Subsequens dies, mercurii, fuit secunda marcii et, in hora qua in monasteriis civitatis Barchinone pulsabatur ad mediam noctem, fuit magnus tremor terre [...] Et hoc, eadem hora, evenit tam ultra quam citra Pirineos montis, fuitque in altioribus partibus Montisserrati sicut in inferioribus.

Perpignan and the territory of Rossellò (France)

The prolonged earthquake, described as "great", was felt by everyone, but did not cause any damage. The source is an annotation in the margin of a calendar of solemn feasts in the *Llibre Vert minor*, a codex of the town's privileges. The text was published in Mengel (1909, p.68), and is also in Olivera *et al.* (1994a, p.118):

"On this day in March in the year 1373 since the birth of Our Lord, a Thursday, just

before the middle of the night or thereabouts, there was a great windless earthquake lasting for about a quarter of an hour at the city of Perpignan and in the territory of Rossellò, causing everyone to tremble [...] greatly [...] without damage [...]."

Ista die mensis martii que erat dies jovis ante mediam noctem vel circiter anno a nativitate domini M^o CCC^o LXX tertio fuit in villa Perpiniani et in terra ista Rosciolionis [...] magnus terre motus sine vento et duravit per quartam partem unius hore vel circa ex quo omnes gentes valde [...] tremuerunt [...] nec damnum [...].

Saint-Affrique (France)

The earthquake was described as "great". The source consists of extracts translated into modern French and published by Gaujal (1859, p.410) from annotations written at the convent of St-Affrique by André Maurel, a Franciscan friar who probably lived in the 16th century. The extracts cover the period 1238-1539. The annotations for the years 1523-39 are attributed to Maurel. The medieval annotations probably derive from a lost original source, also compiled at the convent of St-Affrique. The text is published in Olivera *et al.* (1994a, p.127):

"1372. On 2 March, in the middle of the night, there was a great earthquake".

1372. Le 2 mars, à minuit, il y eut un grand tremblement de terre.

The earthquake is dated either in the Incarnation style or, more probably, in the Paschal style.

Tortosa (Spain)

The earthquake was felt. No damage is mentioned, but there is a reference to processions during subsequent weeks.

The source is a series of payment notes in a municipal account book. Notes between 5 March and 8 June 1373 record sums allocated for the purchase of wax (Arxiu Municipal de Tortosa, *Llibre de la Claveria*, 1372-1373, fols.86r., 85v., 87r., 94r.). The only annotation known to the Catalan seismic catalogue tradition is that for 11 March 1373. The text of all the annotations is published in Olivera *et al.* (1994a, pp.66, 94, 95, 96, 99). We set out below only the text of the annotation for 11 March, since that is the most important as regards the description of effects:

"[...] the earthquake which occurred in the / town [Tortosa] on Wednesday at vespers, the second day / of this month [March 1373] [...] 8 B[arcelona] l[liuras]".

[...] lo terratrèmol que fo en la / ciutat dimecres a vespre, segon dia del / present mes; [...] VIII lb

Uzerche (France)

The earthquake here was described as "very great". The source is the *Chronicon Userciense*, a Latin chronicle recording brief items of information for the period 1276-1373. It was compiled by various contemporary monks from Uzerche abbey, the last of whom records information for the years 1370-1373. The text was published in De Manteyer (1902, p.415), and is also in Olivera *et al.* (1994a, p.131):

"Note that in the year of Our Lord 1372, on the Thursday after the feast of St. Matthew the Apostle, which was 3 March and the second [day] of Lent, at about cockcrow there was a very great earthquake at the town of Uzerche".

Nota quod anno Domini M CCC LXXII, die jovis post festum beati Mathie apostoli que fuit tercia dies marcii et secunda XLe., circa gualli cantum, fuit in villa Uzerchie maximus terre motus.

The earthquake is dated in the Incarnation style. The feast of St. Matthew was on 24 February.

March 3 **Barcelona** (Spain)

After the earthquake at 02:00 UT at Barcelona, two further shocks were felt there:

3:00 UT the first at about the hour of matins, was brief and less powerful than the main shock;

6:00 UT the second occurred at about dawn and was weak.

The source for these two earthquakes is an the annotation written during the days immediately following the earthquake by a notary called Pere Vidal and included beside the report of the two court sessions at Barcelona on 28 February and 5 March. The text is in Olivera *et al.* (1994a, pp.77, 78):

"The following day, Wednesday 2 March [1373], at the time when the monastery of the city of Barcelona rang the midnight hour, there was a great earthquake [...] After that night, when the ancient bell of the bishop's palace at Barcelona was ringing matins, there was apparently an earth tremor, but it was not very frightening, nor did it last long. There was also a certain shaking of the earth at early dawn".

Subsequens dies, mercurii, fuit secunda marcii et, in hora qua in monasteriis civitatis Barchinone pulsabatur ad mediam noctem, fuit magnus tremor terre [...].

Postea dicta nocte, dum squilla antiquissima Sedis Barchinone pulsabatur ad matutinos, fuit similiter tremore terre, sed non tam terribilis neque duravita tantum. Item in crepuscolo auroree fuit tremor terra aliquantulum.

March 8 **Barcelona** (Spain)

Various people in Barcelona felt a double shock after 2:00 UT (after the middle of the night). The source is the annotation written during the days immediately following the earthquake by the notary Pere Vidal. The text is in Olivera *et al.* (1994a, pp.79):

"On that Monday, after midnight, another earth shock, though not so terrible or so long, was twice felt by various people in that city [Barcelona], and those who felt it bore witness that it had indeed occurred".

Dicta die lune, post mediam noctem, iterum tremor terre, non ita terribilis nec in tantum, fuit bis per diversa personas in dicta civitate sentitus, et qui vidit testimonium perhibuit veritatis.

Lleida (Spain)

The earthquake was probably felt at Lleida. On 8 March, the town council met to arrange devotional rites (Arxiu Municipal de Lleida, *Llibre de Consells*, 1372-1373, fol.57v.). Although the council order does not give a reason for doing so, it was probably a reaction to the shock felt that day, especially since the same council had issued a similar order the day after the strong earthquake of 3 March.

The text of the order is in Olivera *et al.* (1994a, p.115):

"Also, [...] since grave sins are being committed in the town, and therefore people are making vows to our Lord God and Our Lady Saint Mary, we are therefore pleased to make provisions in that connection, so that Our Lord will have mercy upon us [...]".

Item, [...] que en la ciutat se fan grans pecats, per rahó de diverses sacraments que.s fan per les gents de Nostre Senyor Déus e de Nostra Dona Sancta Maria e dels sants, per quals placie que vuyllen acordar sobre açò e provehir, per çò que Nostre Senyor nos haze misericordia et mercè [...].

March 19 **Barcelona** (Spain)

Between 18:00 and 19:00 UT (at dusk, after sunset, when the *Salve Regina* was being recited), there was a very violent shock at Barcelona. A number of people fell down stairs, while others were almost frightened to death. The shock was also felt in a number of unspecified places in Catalonia.

The source is the annotation written by the notary Pere Vidal. The text is in Olivera *et al.* (1994a, p.80):

"Also, on Saturday 19 March in that year [1373], at the hour of dusk, while the bells were ringing for the *Salve Regina* prayer, there was so strong an earthquake in that city [Barcelona] that a number of people fell as they were descending stairs or the steps of their homes, and others were so frightened that they stood half dead with fear. This earthquake was felt in various parts of Catalonia on the same day and at the same hour".

Item, die sabbati XIX marcii, anno predicto, hora crepusculi noctis, dum pulsabatur ad oracionem Salve Reginam, fuit in dicta civitate terre motus, ita satis terribilis quod diverse gentes que in illa hora stabant seu descendebant per scalas sive gradaria domorum ceciderunt, et alique alie stupuerunt et semi mortue stiterunt. Fuit dictus terre motus sentitus, dictis die et hora, per diversas partes Cathalonie.

The contemporary *Chronicon Ulianense* also records this earthquake at Barcelona, but without supplying any details.

Perpignan (France)

The earthquake was weak and lasted for about 4-5 seconds (half the time required to recite a Hail Mary). The source is an annotation in the margin of a calendar of solemn feasts in the *Llibre Vert minor*. The text is in Olivera *et al.* (1994a, p.132):

"On Saturday 19 March in the year 1373 at the time when lights have to be lit, there was a moderate earthquake at the town of Perpignan lasting as long as half a Hail Mary".

Ista die XVIII marcii que erat dies sabati anno M^oCCC^oLXXIII hora dels lums fuit in villa Perpiniani alius modicus terremotus per pausam medie ave maria.

Montpellier (France)

The earthquake was weak; it lasted about 12 seconds (the time required to recite the Lord's Prayer). The source is a chronicle of the town of Montpellier, in Provençal, to be found in a cartulary known as the *Petit Thalamus*. The text is in Olivera *et al.* (1994a, p.133):

"In the year of Our Lord 1372 [Paschal style] [...]. Also, on Saturday 19 March around nightfall there was a small earthquake at Montpellier, lasting for about a Lord's Prayer".

Ian de Notre Senhor MCCCLXXII [...]. Item I dissapte que que fon a XIX de mars entorn lo jorn falhent fon alcun petit terra tremol en Montpellier loqual duret entorn I Pater noster.

Barcelona (Spain)

May 3

At about 15:30 UT (the ninth hour), a shock described as "great" was felt. The source giving the most specific time is the annotation written by the notary Pere Vidal. The text is in Olivera *et al.* (1994a, p.83):

"Also, on Monday 3 May, at the ninth hour, there was a great earthquake".

Item, die lune tercia Madii, hora nona, fuit magnum terre motus.

The 15th century *Crònica del racional de la ciutat de Barcelona* and the *Rúbriques de Bruniquer* also record that this earthquake was felt, but they do not provide any information about its intensity and duration.

Perpignan (France)

The earthquake was described as "great"; it lasted about 8 seconds (the time required to recite a Hail Mary). The source is an annotation in the margin of a calendar of

solemn feasts in the *Llibre Vert minor*. The text is in Olivera *et al.* (1994a, p.135): "On this day [3 May] in the year 1373 since the birth of Our Lord, at the hour when vespers is rung, there was an earthquake at the town of Perpignan which lasted as long as a Hail Mary".

Ista die anno a Nativitate Domini M^oCCC^oLXXIII hora squilla vesperorum fuit in villa Perpiniani terremotus per pausam unius ave maria.

Montpellier (France)

The earthquake was felt; it lasted about 8 seconds (the time required to recite a Hail Mary). The source is a chronicle of the town of Montpellier, in Provençal, to be found in a cartulary known as the *Petit Thalamus*. The text is in Olivera *et al.* (1994a, p.136): "In the year 1373, on the day of the Holy Cross in May [3 May], there was an earthquake at Montpellier between the ninth hour and vespers, which lasted as long as it takes to recite a Hail Mary".

En l'an MCCCLXXIII lo jorn de sancta Cros de may fon alcun terra tremol en Montpellier entre hora nona è vespre lo qual duret per lespazi de dir una Ave Maria.

Saint-Affrique (France)

The earthquake was described as stronger than that of 3 March. The source consists of annotations written at the convent of Saint-Affrique by André Maurel. The text is published in Olivera *et al.* (1994a, p.139):

"1372 [Incarnation style]. On 2 March, in the middle of the night, there was a great earthquake. In that same year, on the day of the Holy Cross in May, at the same hour, there was a more terrible one".

1372. Le 2 mars, à minuit, il y eut un grand tremblement de terre. Cette meme année, le jour de la Sainte-Croix de mai, à la même heure, il y en eut un plus terrible.

May 23 **Barcelona** (Spain)

Between 19:00 and 20:00 UT (the hour of vespers), there was a very strong but brief shock at Barcelona. The source is a letter of 24 May 1373 from king Peter IV the Ceremonious to the governor and royal representative at Rosselló (Arxiu de la Corona d'Aragó, Barcelona, *Cancelleria, Curiae*, reg.1089, fol.59v.). The text is in Olivera *et al.* (1994a, p.86):

"We wish to inform you that yesterday, at the hour of vespers, there was a very strong and terrifying earthquake here at Barcelona, as a result of which there were some strong shakings of buildings, though it lasted only for a short time".

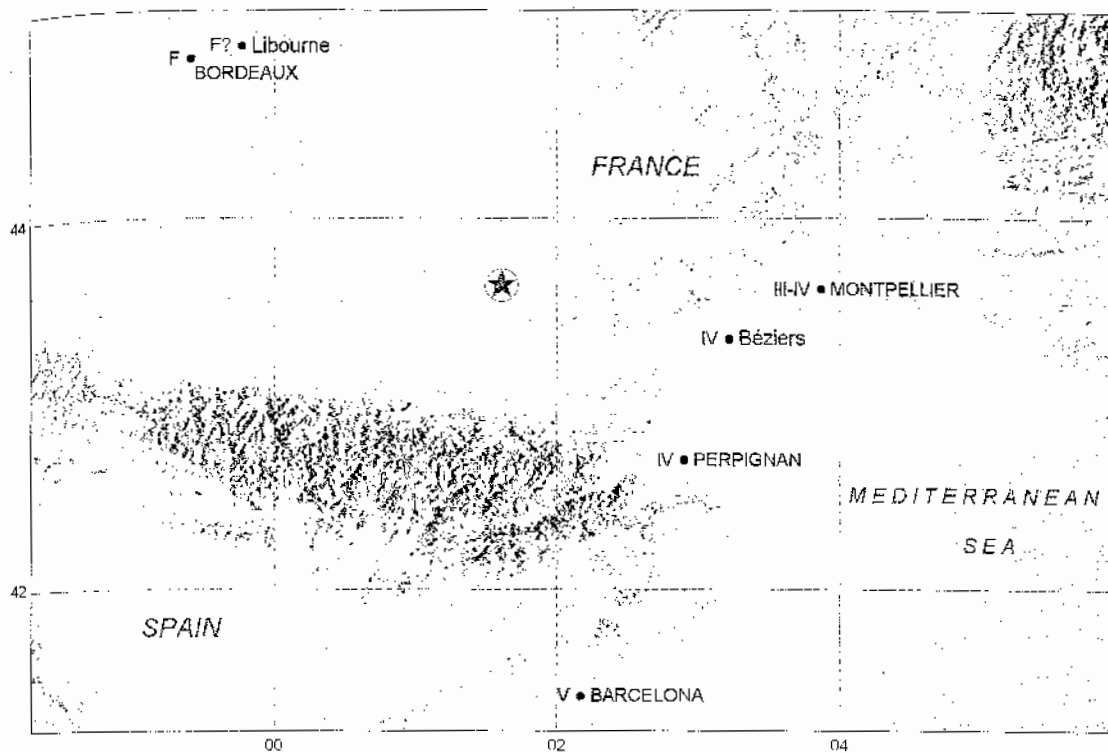
Sapiats que hir, en hora de vespres, feu aci en Barchinona terratrèmol assats forts e espaventable, e per lo qual se seguiren alguns sodegaments de hedificis, ja ssia que durà poc.

The annotations of Pere Vidal, the 15th century *Crònica del racional de la ciutat de Barcelona* and the *Rúbriques de Bruniquer* also record this earthquake, but without supplying any details as to its intensity and duration.

Perpignan (France)

The earthquake was felt. The source is an annotation in the margin of a calendar of solemn feasts in the *Llibre Vert minor*. The text is in Olivera *et al.* (1994a, p.140): "On this day, Monday [23] [...] May in the year 1373 since the birth of Our Lord, at about the hour when vespers is rung, there was an earthquake at the town of Perpignan".

Ista die que erat lune [...] madii anno a Nativitate Domini M^oCCC^oLXX^oIII hora circa squillam vesperorum fuit in villa Perpiniani terremotus.



1373
May 23

0 90 km

fig. 97

Montpellier (France)

The earthquake was felt; it lasted about 12 seconds (the time required to recite the Lord's Prayer). The source is a chronicle of the town of Montpellier to be found in a cartulary known as the *Petit Thalamus*. The text is in Olivera *et al.* (1994a, p.141): "In the year 1373 [...]. Also on Monday 23 May at about the hour of vespers there was an earthquake at Montpellier, which lasted as long as it takes to recite the Lord's Prayer".

En l'an MCCCLXXIII [...] Item I diluns a XXIII de may entorn vespras fon alcun terra tremol en Montpellier lo qual duret entor per lespazi de dir I Pater Noster.

Bordeaux (France)

The earthquake was felt. The source is a 1375 inscription formerly on a portal of the church of St-Eulalie in Bordeaux. The text is published in Olivera *et al.* (1994a, p.144): "Also the earth shook on Monday before the feast of St.Urban, that is to say on 23 May in the year of Our Lord 1373 [...]".

Item tremblet la tera lo dialus abant sent Urban que fo lo XXIII jorn de may l'an de N.S. M CCC LXXIII [...].

Béziers (France)

The earthquake was probably felt. The source is the chronicle by Jacme Mascaro, a contemporary local chronicler, who gives a date only for the 3 March earthquake, adding that an earthquake was felt twice at Béziers in the year 1373. The second occasion was probably 23 May. The text is in Olivera *et al.* (1994a, p.137):

"The year 1373... In the above year, on 2 March, the first Wednesday in Lent, there was a great earthquake half way through the night in the whole of this area and it happened twice in this year".

L'an MCCCLXXIII... L'an sobredig a II jorns del mes de mars lo premier dimercres de carema a miega nueg foug gran terratremol per tot aquest pais e foug dos ves en aquest an.

Libourne (France)

The earthquake was probably felt.

The source is the *Petite Chronique de Guyenne*, which records that after the earthquake of 3 March, there was another shock — for which the hour (the ninth) is given but not the day. It must have roughly coincided with the earthquake of 23 May. The text is in Olivera *et al.* (1994a, p.145):

"In the year 1373 the earth shook. It happened at the midnight hour and again at the ninth hour".

L'an. M.CCC LXXIII. tremblet la terra. E a la hora de meya nuyt e I outra betz a hora nona.

July 22 Barcelona (Spain)

Between 19:00 and 20:00 UT (the hour of vespers) a shock was felt at Barcelona for about 5 seconds (the time required to walk 5 or 6 steps).

The source is the annotation written by the notary Pere Vidal. The text is in Olivera *et al.* (1994a, p.90):

"Also [there was an earthquake] on Friday 22 July at the hour of vespers, and it lasted the time needed to take five or six strides".

Item, [fuit terre motus] die veneris XXII iulii ipsius anni, hora vesperorum, et duravit quantum quis iret V vel VI passus".

September 22 Montpellier (France)

At about 1:30 UT (the eighth hour), a shock was felt at Montpellier for about 12 seconds (the time required to recite the Lord's Prayer). The source is a chronicle of the town of Montpellier to be found in a cartulary known as the *Petit Thalamus*. The text is in Olivera *et al.* (1994a, p.146):

"In the year 1373 [...]. Also, on the night following Wednesday 21 September, at the eighth hour of the night, there was an earthquake at Montpellier which lasted as long as it takes to recite the Lord's Prayer".

En l'an MCCCLXXIII [...]. Item la nueg sequent lo dimecres que era a XXI jorn de setembre egal a VIII horas de la nueg fon alcun terra tremol en Montpellier lo qual duret lo dire de I Pater Noster.



1373 03 03 2:00 UT ☼ = 42 31 00 42 I₀ = VIII Me = 6.3 Sites: 23 EE: 2 Ts

localities	lat.	long.	I	localities	lat.	long.	I
■ La Ribagorza area E	42 25	00 45	VIII-IX EE	■ Lodève F	43 44	03 19	IV-V
Castèl-Leon E	42 44	00 44	VIII	Tortosa E	40 49	00 31	IV-V
■ Toulosain F	43 30	01 20	VII-VIII	■ El Rosselló E	42 36	02 31	V
Albat de Cinca F	41 43	00 09	VII	Montserrat E	41 36	01 49	V
Barcelona E	41 25	02 10	VII Ts	Albi F	43 56	02 08	F
Santa Maria d'Oló E	41 52	02 02	VII	Avignon F	43 57	04 49	F
Gurb E	41 57	02 13	VI-VII	Bordeaux F	44 51	00 36	F
Saint-Sever F	43 21	00 14	V-VI	Libourne F	44 55	00 14	F
Cervera E	41 40	01 17	VI	Montpellier F	43 37	03 52	F
Lleida E	41 37	00 37	VI	Saint-Affrique F	43 57	02 53	F
Perpignan F	42 42	02 54	V	Uzerche F	45 25	01 34	F
Béziers F	43 21	03 13	IV-V	Vila E	42 32	01 34	EE

1373 03 03 3:00 UT

localities	lat.	long.	I
Barcelona	41 25	02 10	IV-V

1373 03 03 6:00 UT

localities	lat.	long.	I
Barcelona	41 25	02 10	III-IV

1373 03 08 2:00 UT

localities	lat.	long.	I	localities	lat.	long.	I
Barcelona	41 25	02 10	IV	Lleida	41 37	00 37	F?

1373 03 19 18:00-19:00 UT Sites: 3

localities	lat.	long.	I	localities	lat.	long.	I
Barcelona E	41 25	02 10	V-VI	Montpellier F	43 37	03 52	III-IV
Perpignan F	42 42	02 54	III-IV				

1373 05 03 15:30 UT ☉ = 42 55 02 57 I₀ = IV-V Me = 5.0 Sites: 4

localities	lat.	long.	I	localities	lat.	long.	I
Barcelona E	41 25	02 10	IV-V	Perpignan F	42 42	02 54	IV-V
Montpellier F	43 37	03 52	F	Saint-Affrique F	43 57	02 53	F

1373 05 23 19:00-20:00 UT ☉ = 43 38 01 37 I₀ = IV-V Me = 5.2 Sites: 6

localities	lat.	long.	I	localities	lat.	long.	I
Barcelona E	41 25	02 10	V	Perpignan F	42 42	02 54	IV
Béziers F	43 21	03 13	IV	Libourne F	44 55	00 14	F?
Bordeaux F	44 51	00 36	F	Montpellier F	43 37	03 52	III-IV

1373 07 22 19:00-20:00 UT

localities	lat.	long.	I
Barcelona	41 25	02 10	F

1373 09 22 1:30 UT

localities	lat.	long.	I
Montpellier	43 37	03 52	F

< 222 > 1373 October 19 – November 17 [Jumada I 775 H.] Cairo [Egypt]

- source 1 Ibn Hajar, *Inba'*, I, p.60
- source 2 al-Suyuti, *Kashf*, p.56
- literature Taher (1979)
- catalogue d. *Ambraseys *et al.* (1994)
- catalogue p. Poirier and Taher (1980)

In the month of *Jumada I* in the year of the Hegira 775, which corresponds to the period 19 October – 17 November 1373, a slight earthquake was felt at Cairo.

The earthquake is recorded by the Egyptian Arab historians Ibn Hajar (1372-1449) and al-Suyuti (1445-1505). The former records:

"in the month of *Jumada I*, there was a slight earthquake".

و في جمادى الأولى حدثت زلزلة لطيفة.

Al-Suyuti's report is similar:

"in the year [7]75, there was a slight earthquake in new Cairo".

و في سنة خمس و سبعين حدثت زلزلة حفيفة بالقاهرة.

An alternative reading of the report in Ibn Hajar I, 60 could provide the exact date as

the first day of *Jumada I* (cf. Ambraseys *et al.*, 1994, p.46), corresponding to 19 October. This earthquake is also recorded by the Turkish historian al-Ayni (1360-1451) (*ʿIqd al-juman*, cf. Taher, 1979, part in Arabic, 197). He provides the same information, except that instead of describing the earthquake as "slight" (لطيفة), he calls it "tremendous" (عظيمة). Taher (1979, p.257) also refers to an earthquake in Egypt in 1372, but this is probably a doublet.

▲ 1373 10 19 – 11 17 [775 H.]

localities	lat.	long.	I
Cairo	30 03	31 15	IV

< 223 > 1374 December 8 Erzncn [eastern Turkey]

- sources 1 *Chron. earth. Erzncn*, in Yerevan ms. 10.200, fol.382v.; Am. Erzncn, *Chron.*, in Yerevan ms. 10.200, fol.386r. (in Xanlaryan 1990, p.542, no.515)
- source 2 Ar. Tabr., *Book*, p.472
- historiography Incicean (1822); Zeyt'unyan (1991)
- literature Abich (1882)
- catalogues d. Sieberg (1932a); Step'anyan (1964)
- catalogues p. Ergin *et al.* (1967); al-Hakeem (1988)

On 8 December 1374, a strong earthquake caused the collapse of the city walls at Erzincan (in present-day Turkey). Our source for this event is the 17th century historian Arakel of Tabriz, who records:

"In 823 [18 December 1373 – 17 December 1374], on 8 December, a Friday, there was an earthquake at Eznkan. It lasted for an hour. People thought that it would not recur, but there was another shock and the city walls collapsed".

Թուին Պիգ դեկտեմբերի ք. օրն ուրբաթ շարժ եղև յեզնկան. ժամ մի եկաց, կարծեցին թէ այլ ոչ շարժի. կրկին շարժեցաւ պարիսպն փլաւ.

Xanlaryan (1990, p.542, no.515) says that the same report is to be found without substantial differences in the unpublished Yerevan ms. 10.200, which contains the *Chronicle of the earthquakes of Eznga* (fol.382v.) and the *Chronology of Amiras of Eznga*.

▲ 1374 12 08

localities	lat.	long.	I
Erzincan	39 44	39 30	VIII

< 224 > 1377 November 14 Tropea [Calabria, southern Italy]

- source *Cron. Sic.*, p.30

This earthquake is unknown to Italian seismic catalogues. On 14 November 1377, an earthquake described as "very great" (*maximus*) struck Tropea on the Tyrrhenian coast of Calabria (a southern Italian region). Further shocks were felt for some days.

In our present state of knowledge, the only available source is the contemporary *Cronicon Siculum*, which was written in the second half of the 14th century by an anonymous chronicler who was probably Neapolitan. The source does not directly state what damage was caused, but provides a qualitative assessment (*maximus*) of the event. In doing so it is following a common practice amongst medieval chroniclers, for whom the adjectives applied to the term "earthquake" provided a kind of assessment

scale. Such adjectives are all the more significant in texts as terse as those of medieval chroniclers. By making comparisons as to the use of these terms in documentary or epigraphic texts, it has often transpired that an earthquake described as *maximus* was one which caused damage. We therefore think it likely that there was damage at Tropea, especially since the earthquake is recorded in an authoritative and non-local source: one capable, that is to say, of assimilating an overall image of the event.

The relevant text in the *Chronicon Siculum* (p.30) reads as follows:

"On 14 November in the same year [1377] in the same indiction [15] there was a very great earthquake at the town of Tropea, and it was felt a number of times over a period of days"

Die XIII novembris eiusdem anni eiusdem Indictione in civitate Tropee fuit maximus terramotus, in diversis diebus fuit diversis vicibus.

▲ 1377 11 14

localities	lat.	long.	I
Tropea	38 40	15 54	VII-VIII?

< 225 > **1384 August 6 Mitylene [Lesbos island, Greece]**

sources *Chron. min. Byz.* 30.2 (Schreiner 1975, p.219); *Notula* in Schreiner (1977, p.613, no.49), previously in Lampros (1910, p.144, no.73); Levalossi-Gazata, *Chron.*, col.90; Cydon., *Corresp.*, p.191; Gonzalez de Clavijo, *Embassy*, pp.38-9

historiography Lampros (1910); Dennis (1965); Schreiner (1975); Tinnefeld (1985)

catalogues d. Perrey (1850); Mallet (1853); Sicberg (1932a); Galanopoulos (1955); Wirth (1966); Ambraseys and Finkel (1991); Evangelatou-Notara (1993); *Papazachos and Papazachou (1997)

catalogues p. Ergin *et al.* (1967); Shebalin *et al.* (1974); Galanopoulos (1981)

During the night of 6 August 1384, Mitylene on the island of Lesbos was struck by a strong earthquake which caused its castle and towers to collapse, killing 500 Genoese, including Francesco Gattilusio, the lord of the city. At that time, in fact, the island of Lesbos was in the hands of the Genoese. The destructive shocks of the night were preceded by numerous others which severely shook towers but did not injure anybody.

The most detailed information about this earthquake is to be found in Pietro Gazata, a contemporary writer who was responsible for the continuation and final redaction of the *Chronicon Regiense*, which had been started by his uncle, Sagacino Levalossi. Pietro dates the earthquake to August 1383:

"In the month of August [1383], at the hour of Nones [perhaps to be taken as meaning the day of Nones = 5 August], at Mitylene, which lies in territory adjacent to that of the Turks and is governed by Genoa, there were very great earthquakes, such that towers shook like trees in the wind, but no-one was injured. However, shortly after the middle of the night, [the shocks] increased in strength to such an extent that the whole castle collapsed, while everybody slumbered. Five hundred Genoese died, including the great fighter [defective text], who was Captain of the army. A small son of the latter, who was in bed with his father, was found not there, but a mile away from the Castle. When asked how he had come to be carried so far, he said he had been carried on an iron grating, but he could not explain how, nor who was responsible for what happened. This [earthquake] did the Genoese great harm".

De mense Augusti horâ Nonarum Mithilenis, quae est in confinio Turcarum, et domini Januae, fuerunt terraemotus maximi, adeo ut turres se concutiebant sicut arbores invicem motae ventis, sed nemine laeso; at post mediam noctem in tantum convaluerunt, ut totum Castrum ceciderit, omnibus somno sopitis. Mortui sunt quingenti Januenses,

inter quos maximus bellator [...] Capitaneus exercitus; unus ejus filius parvus non est ibi inventus, sed inventus est longe a Castro per unum milliare, qui erat in lecto cum patre. Interrogatus, quomodo huc portatus fuisset, dixit, quod portatus fuit per unum cancellum, sed quomodo, nec a quo nesciebat. Hoc maximum damnum fuit Januensibus.

Byzantine sources are more succinct, for they simply mention the death of Francesco Gattilusio. What is known as the *Short Chronicle of Lesbos* (in Schreiner 1975, no.30) records:

“And he [Francesco Gattilusio, lord of Lesbos] was killed by the earthquake which occurred on 6 August in the year 6891 [1 September 1382 – 31 August 1383], dating from the Creation of the World, and from the Coming of Christ, the year 1384 [...]”.

καὶ ἀπεκτάνθη ὑπὸ τοῦ γεγονότος σεισμοῦ κατὰ τὴν ε' τοῦ ἀυγούστου ἐν ἔτει ,σφρα', ἔτους ἀπὸ κτίσεως κόσμου, ἀπὸ δὲ Χριστοῦ καταβάσεως ,απτδ' [...].

There is a short *Notula* in the Andros ms. Monastery of Zoodochos Pigi 88 (in Schreiner 1977, p.613, no.49; previously published in Lampros 1910, p.144, no.73), which may derive from the above chronicle (as is suggested by the wrong dating to 6891: Schreiner 1975, p.218), or more likely, from a more extensive common source:

“Then [after a devastating typhoon on 6 August 6891 = 1383] frequent terrible earthquakes occurred, and the rest of the city [of Mitylene] collapsed, falling on most of the inhabitants”.

εἶτα ἐπεγένοντο φρικώδεις σεισμοὶ καὶ συνεχεῖς ὧν καὶ ἡ λοιπὴ κατέπεσε πόλις καὶ πλείστους τῶν πολιτῶν συνέχωσεν.

Lampros wrongly dated the *Notula* to 1374. *Prosopographisches Lexikon der Palaiologenzeit* 3594 dates the death of Francesco Gattilusio to 6 August 1384.

Reference is also made to this earthquake by Demetrius Cydones, a Byzantine theologian and politician, in a letter to Rhadenus:

“Francesco [Gattilusio] lies buried under a great quantity of dust, mud, wood, iron and stone. Great earthquakes caused towers which he had built to collapse on top of him, as he sought safety for himself and his children. But he found a tomb instead of a bed and a rock instead of a haven”.

Φραντζίσκος, καὶ κεῖται πολλῇ δὴ κόνει καὶ πηλῷ καὶ ξύλοις καὶ σιδήρῳ καὶ λίθοις συγκεχωσμένος, μεγάλων σεισμῶν αὐτοῖς κατενεγκόντων τοὺς πύργους, οὓς ἐκεῖνος σωτηρίαν μὲν αὐτῷ καὶ πασὶ μηχανώμενος ἤγειρεν, εὔρε δὲ τάφους ἀντὶ θαλάμων καὶ σκοπέλους ἀντὶ λιμένων.

The story of how Francesco Gattilusio's son was saved is not only related in Pietro Gazata's chronicle, but also mentioned in the diary of a Spanish ambassador, Ruy Gonzalez de Clavijo, who stopped at Mitylene at the beginning of October 1403, during a long journey which took him from Cadiz (in Spain) to the court of Tamerlane at Samarkand (in present-day Uzbekistan). Clavijo writes:

“The inhabitants of the island are Greek, and were once subject to the empire of Constantinople, but now [in 1403] they are ruled by a Genoese called *messer Giovanni Gattilusio*, whose father married a daughter of the emperor. We heard an extraordinary story about the present lord of the island, according to which, about twenty years ago, while he and his father, mother and two brothers were sleeping in a castle building, the island was shaken by an earthquake. The building collapsed and everyone was killed, except for Giovanni, who was protected by his cradle. Amazingly, he was found the next day, safe and sound, in a vineyard below the castle, at the foot of a very high crag”.

é la gente desta isla es Griega, é solian ser del Imperio de Constantinopla, é agora es de un Genovés que ha nombre Micer Juan de Catalus, é su padre ovo casado con una fija del Emperador de Constantinopla, é de que [desque] agora es Señor desta isla

contaban una muy grande maravilla, y decian, que agora puede aver veinte años, que temblára aquella isla una noche, é que este Señor y su padre é su madre é otros dos sus hermanos, que dormian en un palacio del castillo, é que cayera aquella noche, é que murieran todos salvo este que escapó en una cuna en que estaba, é fallaronlo otro dia en una viña que al pie del castillo estaba, ayuso de unas peñas muy altas, que fué una gran maravilla escapar.

The date 6 August 1383 is accepted by Perrey (1850, p.19), Mallet (1853, p.44), Wirth (1966, p.394), Galanopoulos (1961, p.8; 1981, p.693), Evangelatou-Notara (1993, p.77), and Papazachos and Papazachou (1997, p.194). The date 6 August 1384 has to be kept, since Francesco Gattilusio was still alive in June of that year.

▲ 1384 08 6 at night

localities	lat.	long.	I
Mitylene	39 06	26 33	IX

< 226 > 1385 September 19-20 Cairo [Egypt]

sources 1	Ibn Hajar, <i>Inba'</i> , I, p.303; al-Maqrizi, <i>al-Suluk</i> , III/2, p.534; al-Jawhari, <i>Nuzhat</i> , I, p.120
source 2	al-Suyuti, <i>Kashf</i> , p.56
literature	Taher (1979)
catalogue d.	*Ambraseys <i>et al.</i> (1994)
catalogue p.	Poirier and Taher (1980)

During the night of 19-20 September 1385, two weak earthquake shocks were felt in Cairo. They are recorded by the Arab historians al-Maqrizi (1364-1442), Ibn Hajar (1372-1449), al-Jawhari (15th - 16th century) and al-Suyuti (1445-1505). Al-Maqrizi records:

"On the night of Tuesday 13 [*Sha'ban*], there was an earthquake at new Cairo which caused the earth to shake slightly, twice".

في ليلة الثلاثاء ثالث عشر (شعبان) زلزلت القاهرة مرتين زلزالا قليلا.

Ibn Hajar writes:

"In the month of *Sha'ban*, the earth shook slightly in old and new Cairo (*Misr wa'l-Qahira*). It happened on 13 of that month".

في شعبان زلزلت مصر والقاهرة زلزلة لطيفة وذلك في الثالث عشر منه.

Al-Jawhari's report is similar:

"on Tuesday 13 *Sha'ban*, there were two earthquake shocks at new Cairo, but they were slight".

و في يوم الثلاثاء ثالث عشر شعبان وقعت بالقاهرة زلزلة مرتين ، لكنها خفيفة.

Finally, al-Suyuti records:

"In the year 787, during the night of 13 *Sha'ban*, old and new Cairo shook in a weak earthquake shock".

و في سنة سبع و ثمانين زلزلت مصر و القاهرة زلزلة لطيفة في ليلة الثالث عشر من شعبان.

▲ 1385 09 19-20 at night

localities	lat.	long.	I
Cairo	30 03	31 15	III-IV

< 227 > 1386 March 17 Naples [southern Italy]

source Cron. Sic., p.64

This earthquake is unknown to Italian seismic catalogues.

On 17 March 1386, Naples was struck by an earthquake described as "very great" (*maximus*). In our present state of knowledge, the only available source is the contemporary *Cronicon Siculum*, which was written in the second half of the 14th century by an anonymous chronicler who was probably Neapolitan. The source does not directly state what damage was caused, but provides a qualitative assessment (*maximus*) of the event. In doing so it is following a common practice amongst medieval chroniclers. Such adjectives are all the more significant in texts as terse as those of medieval chronicles. By making comparisons as to the use of these terms in documentary or epigraphic texts, it has often transpired that an earthquake described as *maximus* was one which caused damage. We therefore think it likely that there was damage at Naples. The relevant text of the *Cronicon Siculum* (p.64) reads as follows: "In the same year [1386], in the same month [March], on 17 of that month, [...] there was a very great earthquake at the city of Naples".

Eodem anno, eodem mense XVII eiusdem mensis [...] fuit maximus terremotus in civitate Neapolis.

▲ 1386 03 17

localities	lat.	long.	I
Naples	40 51	14 16	VII-VIII?

< 228 > 1386 July 17 Cairo [Egypt]

sources 1 al-Maqrizi, *al-Suluk*, III/2, p.546; Ibn Hajar, *Inba'*, I, p.315; al-Jawhari, *Nuzhat*, I, p.134

sources 2 al-Suyuti, *Kashf*, p.56; al-Suyuti, *Husn*, II, p.307

literature Tahr (1979)

catalogue d. *Ambraseys *et al.* (1994)

On 17 July 1386, a slight earthquake shock was felt in Cairo. Al Maqrizi (1364-1442) records it amongst the events of *Jumada II* in 788 (= 2 February 1386 – 21 January 1387): "On Tuesday 18 at the fourth hour, new Cairo shook in a slight earthquake shock".

و في يوم الاثنين ثامن عشره زلزلت القاهرة في الساعة الرابعة زلزلة خفيفة.

Ibn Hajar (1372-1449) is a little vaguer:

"in the month of *Jumada II*, the earth shook slightly".

و في جمادى الآخرة زلزلت الأرض زلزلة لطيفة.

Al-Jawhari (15th – 16th century) extends the felt area to include old Cairo as well:

"On 18, which was a Monday, there was a slight earthquake shock at about the fourth hour in old and new Cairo".

و في ثمان عشره - الذي هو الاثنين - زلزلت القاهرة و مصر في الساعة الرابعة زلزلة خفيفة.

Finally, the report is also taken up by al-Suyuti (1445-1505) in two different works: in *Husn* (II, 307), he writes:

"in the year [7]88, in the month of *Jumada II*, the earth was shaken by a slight earthquake".

و في سنة ثمان و ثمانين في جمادى الآخرة زلزلت الأرض زلزلة لطيفة.

And in *Kashf* (56): "On 18 *Jumada II*, there was a slight earthquake".

في ثامن عشر جمادى الآخرة زلزلت الأرض لطيفة.

▲ 1386 07 17 7:45 UT
localities lat. long. I
Cairo 30 03 31 15 III-IV

< 229 > 1387 March 5 Iadera [Croatia]

source Paolo de Paolo, *Mem.*, p.424
literature Albini (2004)
catalogues d. Kispatic (1891-92)
catalogues p. Shebalin *et al.* (1974)

This earthquake is listed in Kispatic's catalogue (1891-92) and recorded in the parametric catalogue of Shebalin *et al.* (1974), but studies are still at a preliminary stage. The review carried out by Albini (2004) considers the single source currently known to record it.

All our information about this and another four earthquakes felt at Iadera (present-day Zadar) in the late 14th and early 15th century (see entries < 233 >, < 250 >, < 251 >, < 261 > in this catalogue) come from the sole contemporary author to record them, namely Paolo de Paolo. He lived at Zadar and wrote a chronicle recording events at the city between 1371 and 1407. However, no manuscript copies or critical editions of Paolo de Paolo's work survive; all we have is a 1668 edition published by Giovanni Lucio, and we do not know whether it is complete and/or revised. In Thomas Trattner's republished edition of 1758, Paolo de Paolo's text is shorter than in Lucio's 1668 edition, so it is difficult to assess this "lost" source.

On 5 March 1387, between 5:00 and 8:00 UT ("during the third hour", in canonical time) there was an earthquake at Zadar, described as "great" (*magnus*). Since Paolo de Paolo does not provide further information about effects, any intensity estimate for this earthquake is based solely on the term "great".

Paolo de Paolo's text, as published by Lucio (1668, p.424) is the following:

"1387. [...] In the same year, on 5 March, at the third hour, there was a great earthquake at Iadera".

1387 [...] *Eodem anno die 5. Martii, hora tertiarum fuit in Iudra terraemotus magnus.*

The earthquake is listed in Shebalin *et al.* (1974) with an epicentral intensity of grade IX MSK, but doubt is expressed by means of a question mark. According to Albini (1994, p.686), the fact that the indication of the date and time of the earthquake does not follow the description of effects, and that the writer goes on to describe life in the town without recording any substantial change, suggests that the intensity has been overestimated and should be reassessed. However, he does not provide a suggested intensity.

The source does not tell us whether the earthquake was felt elsewhere. It is therefore not possible to attribute an epicentral intensity to the event, but only to the site. We agree with Albini that it must be much lower than the value given in Shebalin *et al.* (1974).

▲ 1387 03 05 5:00-8:00 UT
localities lat. long. I
Zadar 44 07 15 15 V-VI

(230) **1389 March 20 Chios island [Greece] > tsunami <**

- sources 1 *Chron. min. Byz.* 107.16 (in Schreiner 1975, p.670); two *Notulae* in Schreiner (1977, pp.614-5, nos.55-56); Heredia (de) Juan Fernandez (grand master of the Hospitallers), Letter, 13 October 1389; Clement VII (antipope), Letter, 10 March 1391 (in Sarnowsky 1992, pp.67-8, no.43, p.74, no.49)
- source 2 *Chron. min. Arm.* II.25, pp.530-2
- historiography Zolotas (1923); Schreiner (1977); Zeyt'unyan (1991)
- literature De Rossi (1892)
- catalogues d. Galanopoulos (1955); Grumel (1958); Galanopoulos (1960; 1961); *Galanopoulos (1981); Evangelatou-Notara (1993); *Papazachos and Papazachou (1997)
- catalogues p. Ergin *et al.* (1967); Shebalin *et al.* (1974); Papadopoulos and Chalkis (1984); Papazachos *et al.* (1986)
- catalogue Ts Ambraseys (1962); Antonopoulos (1980); Soloviev *et al.* (2000)

On 20 March 1389, a strong earthquake struck the island of Chios and the cities of Smyrna and Nea Phocaea (present-day Yenifoça) on the Anatolian coast opposite (western Turkey). On the island of Chios most of the *kastron* collapsed, including its principal buildings and many of its dwellings. Many dwellings outside the *kastron* also collapsed, especially those close to the seashore. The following churches were damaged:

- metropolitan: the north side collapsed, near the altar; the wall fell on to a nearby house, killing a woman;
- St.Nicholas Thalassitis: complete collapse;
- Christ the Saviour: the altar collapsed;
- St.Isidore Tzikalios: the altar collapsed;
- St.Nicholas Vasilikaris: the outer narthex collapsed;
- St.Galaktion: the dome collapsed;
- Isidore the Great: the north side of the dome collapsed;

Domes collapsed in many other unidentified churches.

Most of the city walls collapsed at Smyrna; the castle collapsed at Nea Phocaea.

The earthquake probably also damaged the small island of Icaria to the south of Chios.

Two people are reported to have been killed on Chios.

Tsunami

A sea-wave penetrated as far as the market square in Chios. Those present fled in fright to a nearby hill.

The historical source for effects on buildings

There is a very detailed description of the effects of the earthquake on the island of Chios in a long *Notula* in manuscript of Biblioteca Apostolica Vaticana Ottoboniano *graecus* 381, fols.335v.-336 (in Schreiner 1977, p.615, no.56). The author had personal experience of the earthquake:

"In the year 6897, in the twelfth indiction [1 September 1388 – 31 August 1389], on 20 March, a Saturday, at the eighth hour of the day, in the ninth solar cycle, in the nineteenth lunar cycle, a dreadful earthquake struck the island of Chios, with the result that most of the *kastron* (castle) collapsed, and the principal *kastron* buildings collapsed, and most of its dwellings fell down in ruins. The north side of the metropolitan church, near the altar, also collapsed and fell on to a nearby house, in which a woman was killed; and another woman died in the same earthquake. Many dwellings outside the *kastron* also collapsed, mostly those which were near the seashore, at what is known as *Neon Chorion*. The [church of] St.Nicholas Thalassitis collapsed, and the altar [of the church] of Christ the Saviour, and the altar [of the church] of St.Isidore Tzikalios, and the outer narthex [of the church] of St.Nicholas Vasilikaris. The dome [of the church] of St.Galaktion also collapsed in ruins, as did those of many other churches. And the

north side of the dome [of the church] of Isidore the Great also collapsed. [He goes on to describe the tsunami: see below] Smyrna also collapsed, as did the *koulas* [from the Turkish word *kule* = 'tower', but here rather 'castle' or 'acropolis'] at Nea Phocaea, and even Caria. The good God in his mercy saved us beyond all hope from this tremendous earthquake. To this same God be glory throughout the centuries, amen".

τῷ ἑσπέρῳ ἔτει, ἰνδικτιῶνος ιβ', μηνὶ μαρτίῳ κ', ἡμέρᾳ σαββάτῳ, ὥρα ὀγδόῃ τῆς ἡμέρας, ἡλίου κύκλος θ', σελήνης κύκλος ιθ', ἐγένετο σεισμός φοβερός ἐν τῇ νήσῳ Χίῳ, ὥστε χαλασθῆναι τὸ πλεῖστον μέρος τοῦ κάστρου καὶ καταπέσαι καὶ ἐκ τῶν μεγάλων οἰκιῶν τοῦ κάστρου καὶ καταρραγῆναι καὶ θραυσθῆναι τὰ οἰκήματα τὰ πλεῖστα αὐτοῦ. ἐχάλασε δὲ καὶ τῆς μετροπόλεως τὸ βόρειον μέρος τὸ πλησίον τοῦ βήματος καὶ ἔπεσεν ἐπὶ τῷ πλησίον αὐτῆς οἴκῳ, ἐν ᾧ συνέβη γυναῖκα τινὰ εὐρεθῆναι ἐν αὐτῷ καὶ ἀποθανεῖν, ἀπέθανε τε καὶ ἄλλη τις γυνὴ ἐν τῷ αὐτῷ σεισμῷ. ἔπεσον δὲ καὶ ἐκτὸς τοῦ κάστρου οἰκίαι πολλαὶ αἱ πλησιάζουσαι μᾶλλον τοῦ αἰγιαλοῦ τοῦ καλουμένου νέου χωρίου. ἐχάλασεν ὁ ἅγιος Νικόλαος ὁ Θαλασσίτης, καὶ τὸ βῆμα τοῦ σωτήρος Χριστοῦ, καὶ τὸ βῆμα τοῦ ἀγίου Ἰσιδώρου τοῦ Τζικαλίου, καὶ τὸ ἐξονάρθηκον τοῦ ἀγίου Νικολάου τοῦ Βασιλικάρη. διερράγησε δὲ καὶ κατεθραύσθη καὶ ὁ θόλος τοῦ ἀγίου Γαλακτιῶνος, καὶ ἄλλων πολλῶν ἐκκλησιῶν. ἀλλὰ δὴ καὶ τὸ βόρειον μέρος τῆς τρούλλης τοῦ μεγάλου Ἰσιδώρου. [...] ἐχάλασε δὲ καὶ ἡ Σμύρνη, καὶ ὁ κουλᾶς τῆς Φωκέας τῆς νέας, ἀλλὰ δὴ καὶ ἡ Καρία τέλεον. Οὕτινος φοβεροῦ σεισμοῦ γεγονότος μετὰ φιλανθρωπίας παρ' ἐλπίδα ἐλυτρώσατο ἡμᾶς ὁ οἰκτίμων καὶ ἐλεήμων θεός. αὐτῷ ἡ δόξα εἰς τοὺς αἰῶνας ἀμήν.

In 1389, 20 March was indeed a Saturday. As Evangelatou-Notara (1993, pp.90-1) has suggested, the reference to Caria should probably be taken as referring to Icaria, a small island to the south of Chios, and much nearer the area of major seismic effects than the distant region of Caria (now south-west Turkey, opposite the island of Rhodes). The Greek text of this *Notula* was published with an Italian translation and brief commentary by De Rossi (1892, pp.46-9); but the earthquake was wrongly dated to 1388.

The following brief information appears in a *Notula* in manuscript II D 26, fol.34 of Biblioteca Centrale della Regione Siciliana in Palermo (in Schreiner 1977, p.614, no.55): "In the year 6897 [1 September 1388 – 31 August 1389], on 20 March, a Saturday, at the eighth hour, during the reign of the very pious Emperor John, there was also so great an earthquake that the walls of Chios collapsed, and, alas, many churches also collapsed and fell [the *Notula* goes on to refer to the tsunami: see below]".

ἔτος 6897, μηνὶ μαρτίου 20, ἡμέρᾳ σαββάτῳ, ὥρα 8, ἐπὶ τῆς βασιλείας τοῦ εὐσεβεστάτου βασιλέως Ἰωάννου ἐγένετο καὶ μέγιστος σεισμός ὅτε κατέπεσον τὰ τεῖχη τῆς Χίου καὶ, οἴμοι, καὶ ναοὶ πολλοὶ διερράγησαν καὶ κατέπεσον [...]

There is a very brief reference to the earthquake in a chronicle in manuscript of Biblioteca Apostolica Vaticana *graecus* 1369, fol.355 (in Schreiner 1975, no.107):

"In the same year [6897 = 1 September 1388 – 31 August 1389] there was a great earthquake".

τὸ αὐτὸ ἔτος ἔγινε μέγας σεισμός.

For topographical problems and the churches of Chios, see the observations in Zolotas (1923). Primary Latin sources also contain useful information. There are two letters, written in 1389 and 1391, now in the National Library of Malta, which mention the predicament of Smyrna after the earthquake and the economic crisis.

The first letter (published in Sarnowsky 1992, no.43, pp.67-8), dated 13 October 1389, was sent from Avignon by the Grand Master of the Hospitallers, Juan Fernandez de Heredia to the Prior of the Order for Champagne, Guillaume de Fonteney:

"To Brother John [...] to the religious [...]. Brother Guillaume de Fonteney, Prior of

Champagne from his own house [...]. We write to inform you that we have received letters from our lieutenant responsible for our fellow brethren at the above-mentioned house [at Smyrna], from the knight commanders, priors and most eminent members of our convent in Rhodes, drawing our attention to their many needs, resulting from their poverty and the wretched state in which they find themselves because of the unusually heavy burden of expense to which they are put for the safeguarding and protection of the city of Smyrna, for repairs to the city walls which were destroyed in the earthquake, and for fitting out and sending on missions the galleys of the joint fleet set up with the king of Cyprus and other lords of the eastern lands for the defence of the lands which they have held and still hold [...]. Given at Avignon, the 13th day of the month of October in the year of our Lord 1389.

Frater Johannes [...] religioso [...] fratri Guillelmo de Fonteneyo, priori Campanie domus eiusdem [...]. Vestre deducimus noticie nos recipisse litteras a dicte domus fratribus nostrum locumtenente, baillivis, prioribus et proceribus nostri Rodi conventus, mentionem facientes de suis perplexis paupertatis neccessitatibus et eorum miserabili statu, quibus ipsi subiciuntur propter gravia onera expensarum, que plus solito eos tollerare et sustinere oportuit in custodia et protectione civitatis Smirnarum, ipsius murorum. destructorum propter terre motum reparatione et in expensis et missionibus galearum unionis facte inter regem Cippi, eos et alios dominos parcium orientis pro deffentione suarum terrarum, quas tenuerunt et tenent [...]. Data Avinione die decima tertia mensis Octobris anno incarnationis domini millesimo trecentesimo octuagesimo nono.

In another letter (published in Sarnowsky 1992, no.49, p.74), dated 10 March 1391, the antipope Clement VII (1378-1394) renewed the indulgences which had been promised in a previous letter of April 1390 (in Sarnowsky 1992, no.45, pp.70-1), the income from which was to be used for repairing the fortifications at Smyrna:

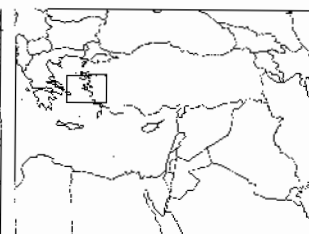
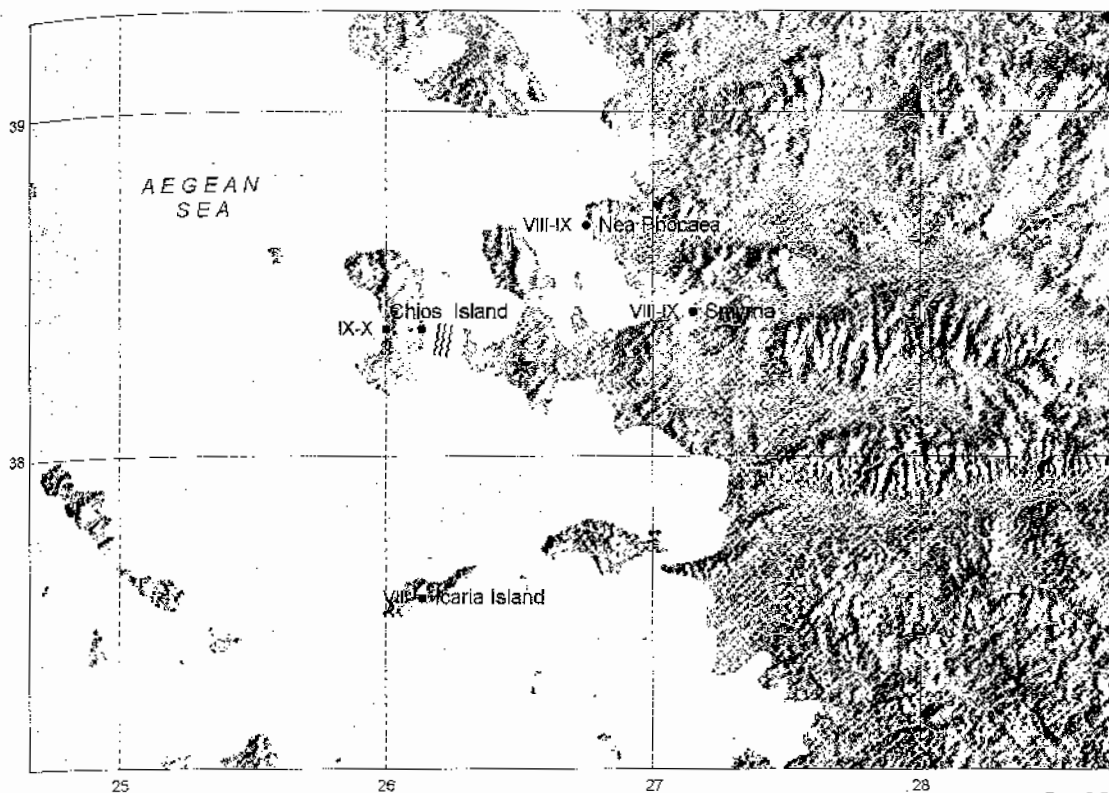
"Bishop Clement, servant of the servants of God. To our venerable brother patriarchs, archbishops, bishops and our beloved chosen sons, the abbots, priors and other ecclesiastics, lay and regular, who receive this letter, greetings and our apostolic blessing. For some time we have sought, in order to support the safeguarding and defence of the city of Smyrna, which lies close to territories [controlled] by the infidel Turks, and to pay for repairs to its walls, which had collapsed a little earlier, largely as a result of an earthquake, that what has so far been collected should be distributed, with remission of the sins [of the donors], as holy alms and welcome charitable assistance, for the above-mentioned safeguarding, defence and repairs [...]. Given at Avignon, on the sixth day before the ides of March [10 March] in the thirteenth year of our pontificate [1391]".

Clemens episcopus servus servorum dei. Venerabilibus fratribus patriarchis, archiepiscopis et episcopis ac delectis filiis electis, abbatibus, prioribus et aliis ecclesiarum prelatibus, secularibus et regularibus, ad quod presentes littere pervenerint, salutem et apostolicam benedictionem. Dudum ad custodiam et defensionem civitatis Smirniarum, que circa fines infidelium Turchorum est posita, et reparatione menium eius, que pro maiori parte ex terre motu tunc noviter corruerant [...], rogavimus eis in remissione peccaminum [...], quatinus a bonis sibi adeo collatis ad custodiam, defensionem et reparationem predictas pias elemosinas et grata caritatis subsidia erogarent [...]. Datum Avinione 6 idus Marcii pontificatus nostri anno terciodecimo.

Tsunami

There is a description of the effects of the tsunami on the island of Chios in the long *Notula* in manuscript of Biblioteca Apostolica Vaticana *Ottoboniano graecus* 381, fols.335v-336 (in Schreiner 1977, p.615, no.56), quoted above:

"Then the sea invaded [the land] as far as the windmill of the internal sea [?], and then changed direction again and from its usual limits reached the middle of the market square, with the result that men fled in fear and climbed as far as the *Trullotes*".



1389
March 20

0 60 km

fig. 98

συνέβη δὲ ἐν ταύτῳ φυράσαι τὴν θάλασσαν ἄχρι τοῦ ἐντὸς ἀνεμομύλου τῆς θαλάσσης, ἔπειτα ἐπαναστραφῆναι καὶ τῶν τῶν οἰκείων ὄρων αὐτῆς ἐξελεθεῖν ἕως τῆς ἡμίσεως πλάτζας τοῦ ἐμπορίου, ὥστε φοβηθῆναι τοὺς ἀνθρώπους φεύγειν καὶ ἐπανερχεσθαι ἄχρι τῆς Τρουλλωτῆς.

There is a brief version of this information in a *Notula* in Palermo manuscript, Biblioteca Nazionale II D 26, fol.34 (in Schreiner 1977, p.614, no.55): "and the sea boiled and flooded as far as the middle of the square and then returned to its place".

καὶ ἡ θάλασσα ἀναβράσασα καὶ ἐξῆλθεν ἕως τὸ ἥμισυ τοῦ φόρου καὶ αὐτὴ ἀπεστράφη ἐν τῷ ἰδίῳ τόπῳ αὐτῆς.

In Ergin *et al.* (1967, p.18, no.171), the earthquake is wrongly dated to 1388.

▲ 1389 03 20 12:30 UT ★ = 38 16 26 31 I₀ = VIII-IX Me = 5.8 Sites: 4 Ts

localities	lat.	long.	I	localities	lat.	long.	I
■ Chios island GR	38 22	26 00	IX-X Ts	Icaria GR	37 35	26 08	VIII
Yenifoça TR	38 40	26 45	VIII-IX	Chios GR	38 22	26 16	Ts
Smyrna TR	38 25	27 09	VIII-IX				

< 231 > 1389 August 20 Moggio Udinese [north-eastern Italy]

source 1 Miari, *Cron.*, p.25

sources 2 BCUD, *Mss.*, Fon. Princ., 873, *Apographa*; Fon. Joppi, 454, Joppi, *Schede*, fol.15v.

historiography Denza (1874); Corbanese (1983-87)

catalogues d. Tommasi (1888); Baratta (1901); Ambraseys (1976); *Boschi *et al.* (1997, 2000)

catalogues p. Giorgetti and Iaccarino (1971); Carrozzo *et al.* (1973); Iaccarino and Molin (1978); Postpischl (1985); CPTI (1999)

On 20 August 1389, an earthquake struck the southern slopes of the Carnic Alps and the Dolomites in the mountainous area between the rivers Tagliamento and Piave. The abbey at Moggio Udinese suffered damage, but although the earthquake was strongly felt at Udine, there are no reports of damage there. The earthquake was also felt at Belluno.

This seismic event is recorded in the catalogue of Friuli earthquakes by Tommasi (1888), who used two sources: the *Necrologium Mosacense*, a manuscript from the abbey of Moggio Udinese (but he does not say where it is to be found), and documents belonging to Gerolamo Q.Candidi, a notary of Udine, now in the Archivio di Stato at Udine. Information about Belluno is recorded in a contemporary local source, namely the *Cronaca bellunese* by Clemente Miari, who was a canon at Belluno at the turn of the 14th century. The corpus of documents from the abbey of Moggio Udinese has found its way partly into the Archivio Arcivescovile at Udine, and partly into the Archivio di Stato in the same city, and consists solely of documents dating to later than the second half of the 15th century. Some materials are still kept at the abbey, but they have not been inventoried and are not in a state to be consulted.

Amongst the material transcribed by Liruti, a 19th century scholar, in the *Fondo Principale* of manuscripts in the Biblioteca Comunale at Udine (873, *Apographa Liruti*), we have identified a text deriving from a parchment from the abbey of Moggio Udinese, which is probably the one quoted by Tommasi (1888):

"In the year of Our Lord 1389, on the thirteenth day before the Calends of September [20 August], there was a very great earthquake which split open the whole church of Moggio and caused a great deal of damage elsewhere".

Anno Domini MCCCLXXXIX. XIII. kalendas septembris in hac die fuit maximus terremotus itaquod tota ecclesia Mosacensis scissa fuit, et plures ruina fuerunt alibi.

The same text is quoted in manuscripts in the *Fondo Joppi* (454), also in the Biblioteca Comunale at Udine.

Documents produced by a notary named Candidi, who was chancellor to the *Capitano del Popolo* and subsequently to the *Luogotenente* of Venice, are preserved in 10 files, 5 of which contain private documents, and 5 court documents. Since all these documents belong to the period 1418-1490 and are therefore later than the earthquake, finding references to the earthquake is difficult, because it may happen to have been recorded in papers not relating to the year when it occurred. However, we think that the reference to Udine made by Tommasi (1888) is reliable, even though it has not been possible to identify his source. The *Cronaca bellunese* by Clemente Miari, records as follows:

"On Friday 20 August in that year 1389, in the 12th indiction, an earthquake resounded in Belluno at the eighth hour".

Nel venerdì del 20 agosto di quell'anno 1389, indizione XII, all'ora ottava romoreggiò in Belluno un terremoto.

▲ 1389 08 20 13:00 UT Sites: 3

localities	lat.	long.	I	localities	lat.	long.	I
Moggio Udinese	46 24	13 12	VII-VIII	Udine	46 04	13 14	V
Belluno	46 09	12 13	V				

< 232 > **1389 October 18 Umbria and Marche Apennines [central Italy]**

sources 1 [manuscripts] ASC Città di Castello, *Riformanze*, reg.23, 20 October 1389; 4 November 1389; BMedLaur, Florence, *Plutei*, 66.25, *Libellus* V, a.1454
Deed of sale, 11 June 1396, in Leonardi (1982, p.86); [Carboni], *Cron. lat.*, pp.9-10; Laurenzi, *Cron.*, p.80; Guerr. Gubbio, *Cron.*, p.26; *Ann. Foroliv.*, p.75

- sources 2 BCSansepolcro, J.107, Bercordati, *Cron.*, fol.38v.; Graziani, *De scriptis*, p.33
- historiography Farulli (1713); Muzi (1842-44); Goracci (1847); Leonardi (1982, 1984); Coleschi (1984); Agnoletti (1986)
- literature Castelli and Moriani (1990); Castelli (1991); Castelli *et al.* (1997)
- catalogues d. Pilla (1846); Perrey (1848); Mallet (1853); Guarini (1880); Mercalli (1883); Baratta (1901); *Conversini *et al.* (1990); *Boschi *et al.* (1997, 2000)
- catalogues p. Giorgetti and Iaccarino (1971); Carrozzo *et al.* (1973); Postpischl (1985); CPTI (1999)

Towards dusk on 18 October 1389, a strong earthquake struck an area of the Apennines in Umbria and the Marche which acts as a divide between the upper valley of the river Tiber (the Tiberina Valley) and that of the river Metauro. The shocks began on 16 October 1389 and lasted for about a month. The most serious effects occurred in the *contado* (a rural area subject to the urban authorities) of Città di Castello, where many houses collapsed and there were many victims. Worst hit were the three villages of Castel Guelfo, Il Baciuccheto and Pietragialla, where most houses collapsed. At Città di Castello, many houses either collapsed or were badly damaged, the town walls gave way at various places, and 130 merlons fell down. The townspeople were obliged to take shelter in shacks put up in gardens, or else to flee from the town into the countryside. Houses at Castel Durante (now Urbania) and Mercatello sul Metauro were badly damaged; the bell-tower of the parish church at Mercatello was reduced to a dangerous state, and threatened to collapse on to the church itself and neighbouring houses. Houses at Borgo San Sepolcro (now Sansepolcro) were very seriously damaged. According to a 16th century writer (Graziani, ed. 1745), the town walls also collapsed. The task of repairing these walls was entrusted to the famous architect Nicola Aretino, who made them stronger and better fortified than before. There is also evidence of repair work to wells, and the construction of subterranean channels and sewers. According to contemporary theory, which was still Aristotelian in nature, such works would permit the artificial release of the subterranean exhalations which were thought to be responsible for earthquakes.

Historical sources

There is evidence for this earthquake in contemporary sources written at the time of the shocks or shortly afterwards. These sources are *Riformanze* (enactments by town councils), a notarial deed of 1396, and chronicles which were either contemporary or written during the 15th century.

DOCUMENTS

The minutes of the Città di Castello town council meeting held on 20 October 1389, two days after the most violent shock, already include a reference to damage in the town and in fortified settlements in the *contado*. The document in question survives amongst the *Riformanze* (also known as the *Annali Tiferinati*) in the Archivio Storico Comunale at Città di Castello (reg.23). Here are some of the more significant passages:

"The twentieth day of October [1389]

[...] the castles and fortresses of the *contado* of Città di Castello have great need of repair, maintenance and care because of the earthquake and for many other reasons [...].

The same twentieth day of October

[...] for fear of earthquakes, the citizens and inhabitants of the *contado* of Città di Castello are living outside their homes. And for their dwellings [...] they have set up shacks and sheds in the fields and gardens.

Die vigesima octobris [...] castra et fortelitia comitatus Civitatis Castellii propter terremotus et ex aliis multis ex causis indigeant multa reparatione custodia et provisione.

Eadem die vigesima octobris [...] propter timore terremotuum cives et comitatum

Civitatis Castellii habitant extra domos eorum. Et eorum habitationes [...] trabacchas et capannas fecierint in campis et giardinis [...].

The earthquake is also mentioned in the minutes of meetings held on 4 November, and 20 and 28-29 December 1389 by the same town council of Città di Castello.

Evidence of damage at Mercatello sul Metauro is to be found in a notarial deed drawn up by notary Luca Uguccioni on 11 June 1396, in which there is specific reference to the earthquakes of October 1389. The original parchment is in the Archivio Arcipretale of Mercatello sul Metauro (no.55), and its text has been published in Leonardi (1982, p.86). Set out below is the passage concerning damage to the parish church bell-tower: "In the year 1396 since the birth of Christ, in the fourth indiction, at the time of pope Boniface IX, on 11 June. Since the bell-tower of the parish church of Mercatello was threatening to collapse in ruins because of the terrible earthquakes which struck there in the year 1389 in the month of October, to the extent that the people and houses around the said bell-tower were in great danger; and in order to avoid serious damage from the collapse of the said bell-tower, as reported by all those who were keeping a careful watch on it, it was therefore considered both necessary and opportune that the said bell-tower should be repaired.

Anno eiusdem a Nativitate Millesimo Trecentesimo Nonagesimo Sexto indictione quarta tempore Domini Bonifacii Pape IX die undecima mensis junii. Cum campanile plebis Mercatelli propter terribiles terremotus qui fuerunt in anno Domini MCCCLXXXVIII de mense octubri ruinam et precipitium minaretur adeo quod ipsa Plebs et domus circustantes campanile predictum in magno stabant periculo et ne maxima sequerentur damna ex ruina campanilis predicti prout omnibus campanile ipsum intuentibus erat notorium et ob hoc oportebat ex magna necessitate et utilitate campanile ipsum reactari.

CHRONICLES

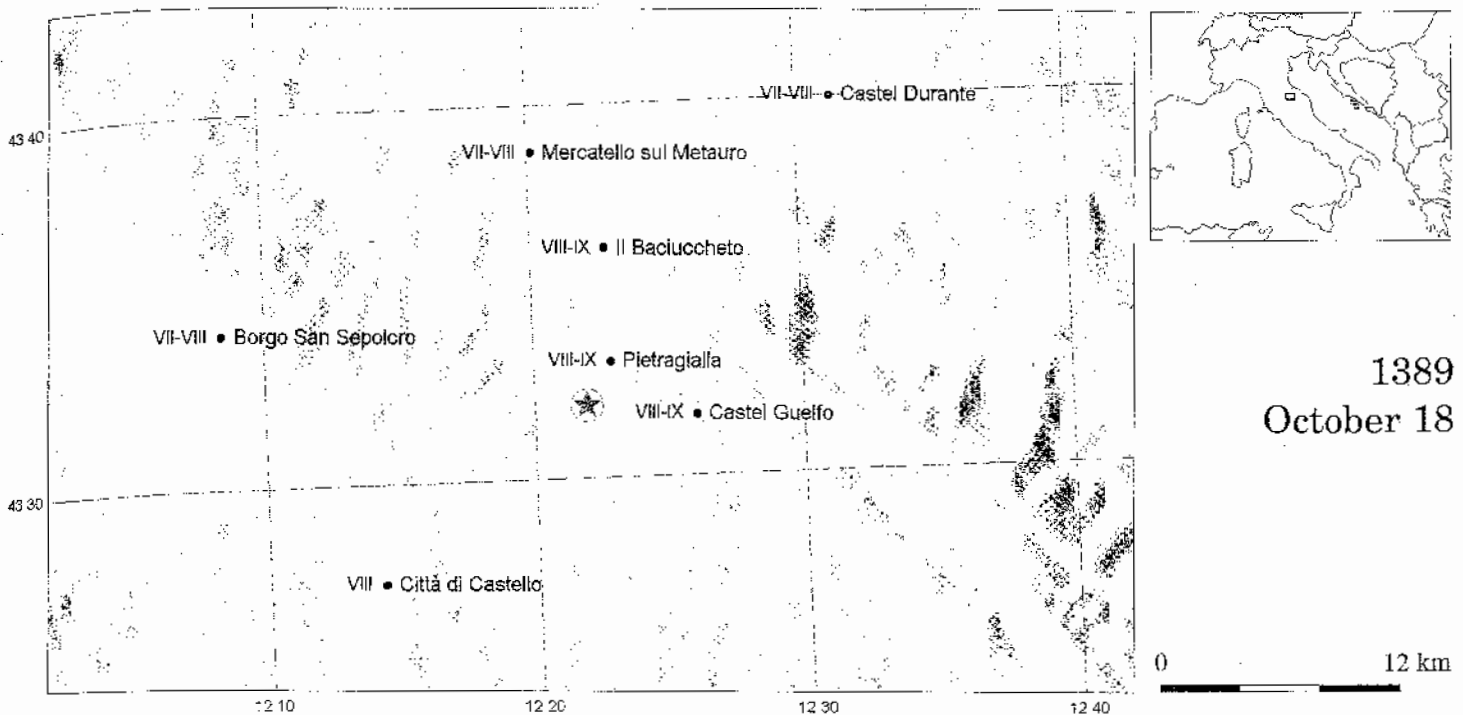
The most informative of the 15th century chronicle sources are two local Città di Castello compilations: one of these, in Latin, is attributed to Angelo Cerboni, a notary, and was continued by other members of his family; the other is in the vernacular, and was written by Cesare and Pietro Laurenzi. Cerboni writes:

"1389, on the Ides of October [15 October]. Urban VI died, and on 2 November Boniface IX was elected pope. Earthquakes began on the following day, and lasted for forty days, the strongest shock occurring on the feast of St.Luke [18 October]; many houses collapsed, and 130 merlons fell from the town walls. Castelguelfo, Bacciucheto and Pietragialla were reduced to ruins, as well as many *palazzi* and towers inside and outside Città di Castello".

1389 idibus octubris. Obiit Urbanus sextus, assumptus est in pontificatum die secunda novembris Bonifatius nonus. Sequenti die cepere terrae motus, qui duraverunt quatragesima diebus, et in die S.Luciae fuit maximus: multae domus dirutae sunt et murorum pennae CXXX cecidere, dirutum est Castrum Ghelfum, Bacciuchetum et Petragialla et multa palatia et turres intra et extra Civitatem.

Laurenzi's chronicle provides a few extra details:

"1389, on 16 October, a Saturday. Earthquakes began at Città di Castello and the surrounding country on the day of the feast of St.Luke. On 18 October at the hour of compline, there was so powerful a shock in the town that many houses collapsed and many others were damaged. 130 merlons fell down along the town walls, and the walls were damaged in many places. In the *contado*, furthermore, Castelguelfo, Baciucchetto and Pietragialla were reduced to ruins, along with a great many houses, and there were many victims; and the townspeople put up many shacks in gardens, and some were so frightened that they went to live in the *contado*. This earthquake scourge lasted for 30 days".



1389
October 18

fig. 99

1389 16 ottobre, di sabbato. Cominciorno li terremoti a Città di Castello con tutto il paese il dì della festa di S.Luca. Adì 18 ottobre a hora di compieta venne un terremoto sì grande alla città per cui caddero molte case et molte ne rimasero magagnate. Caddero intorno alli muri della città da 130 merli e magagnaronsi le mura in molti luoghi. Di più caddero nel contado Castelguelfo, Basciucheto et Pietragialla et una gran quantità di case nel contado, e morirno molte persone, et li huomini di detta città fecero molte trabacche per gli orti, e parte per paura andorno ad abitare nel contado. Durò questo flagello de terremoti 30 giorni.

The *Annales Forolivienses* allow us to add the towns of Castel Durante (now Urbania) and Borgo San Sepolcro (now Sansepolcro) to the list of localities affected:

"In the month of October [1389]. There was a tremendous earthquake, especially in Tuscany, at Città di Castello, Castel Durante, Mercatello and Borgo San Sepolcro. Many houses collapsed and almost everyone felt it throughout Italy".

De mense octubris. Teremotus maximus fuit, maxime in Thuscia, in Civitate Castelli et in Castro Durante, Mercatello et Burgho Sancti Sepulcri, et multe domus ceciderunt et per Italiam fere omnes senserunt.

The information provided by Guerriero da Gubbio is couched in more general terms, for he does not indicate the day or the month of the earthquake, and his text makes it difficult to judge whether Gubbio itself was also affected by the earthquake:

"In the said year [1389], there was great famine and tremendous earthquakes, in which many buildings collapsed".

Nel dicto anno fo gran carestia et tremoti grandissimi per li quali molti ediftii cascaro.

As far as Borgo San Sepolcro is concerned, there is evidence of earthquake effects in the anonymous *Libellus supplex*, a 15th century manuscript now in the Biblioteca Medicea Laurenziana in Florence (*Plutei* 66.25):

"In the year 452 since the building of Borgo [San Sepolcro], the year 1389 since the

Incarnation, during the last year of the pontificate of Urban VI, and the 11th year of the reign of Wenceslas, strong earthquakes were felt. They shook everything at Borgo di San Sepolcro and beyond the Trabarian Alps [in the Bocca Trabaria area] in the months of October and November”.

Anno a Burgo constructo cccclii, Incarnationis vero Mccclxxxviii, pontificatus Urbani sexti anno ultimo, et imperii Vincislai anno xi Terremotus graves, rebus concussibus in Burgo Sancti Sepulcri et ultra alpes trabarias facti in mensibus Octobris et Novembris.

▲ 1389 10 18 ★ = 43 32 12 22 I₀ = VIII-IX Me = 5.8 Sites: 7

localities	lat.	long.	I	localities	lat.	long.	I
Castel Guelfo	43 32	12 26	VIII-IX	Mercatello sul Met.	43 39	12 20	VII-VIII
Il Baciuccheto	43 36	12 23	VIII-IX	Sansepolcro	43 34	12 08	VII-VIII
Pietragialla	43 33	12 23	VIII-IX	Urbania	43 40	12 31	VII-VIII
Città di Castello	43 27	12 14	VIII				

< 233 > **1390 December 5 Iadera [Croatia]**

source Paolo de Paolo, *Mem.*, p.425

literature Albin (2004)

catalogues d. Kispatic (1891-92)

catalogues p. Shebalin *et al.* (1974)

This earthquake is listed in Kispatic's catalogue (1891-92) and recorded in the parametric catalogue of Shebalin *et al.* (1974), but studies are still at a preliminary stage. The review carried out by Albin (2004) considers the single source currently known to record it. All our information about this and another four earthquakes felt at Iadera (present-day Zadar) in the late 14th and early 15th century (see entries < 229 >, < 250 >, < 251 >, < 261 > in this catalogue) come from the sole contemporary author to record them, namely Paolo de Paolo. He lived at Zadar and wrote a chronicle recording events at the city between 1371 and 1407. However, no manuscript copies or critical editions of Paolo de Paolo's work survive; all we have is a 1668 edition published by Giovanni Lucio, and we do not know whether it is complete and/or revised. In Thomas Trattner's republished edition of 1758, Paolo de Paolo's text is shorter than in Lucio's 1668 edition, so it is difficult to assess this "lost" source. On 5 December 1390, between 1:00 and 2:00 UT (around the middle of the night in canonical time), there was an earthquake at Zadar which is described as "great" (*magnus*). Since Paolo de Paolo gives no further information about effects, any intensity attribution is based solely on the term "great". Paolo de Paolo's text, as published by Lucio (1668, p.425) is the following: "1390. On 5 December around the middle of the night there was a great earthquake [in Iadera]".

1390. die 5. Decembris circa mediam noctem fuit terrae motus magnus.

The earthquake is listed in Shebalin *et al.* (1974) with an epicentral intensity of grade IX MSK, but doubt is expressed by means of a question mark. According to Albin (1994, p.686), the fact that the indication of the date and time of the earthquake does not follow the description of effects, and that the writer goes on to describe life in the town without recording any substantial change, suggests that the intensity has been overestimated and should be reassessed. However, Albin does not provide a suggested intensity. The source does not tell us whether the earthquake was felt elsewhere. It is therefore not possible to attribute an epicentral intensity to the event, but only to the site. We agree with Albin that it must be much lower than the value given in Shebalin *et al.* (1974).

▲ 1390 12 05 01:00-02:00 UT

localities	lat.	long.	I
Zadar	44 07	15 15	V-VI

< 234 > 1391 August 15 Constantinople? [north-western Turkey] doubtful event

source Ign. Smol., *Journ.*, p.105

historiography Seemann (1967); Majeska (1984)

catalogues d. Wirth (1966); Evangelatou-Notara (1993)

On 15 August 1391 there was an earthquake which may have been felt at Constantinople. Its effects are not specified. The source is the Russian traveller Ignatius of Smolensk, who visited Constantinople around that time:

"In the year 6899 [in Byzantine style; 1391], on 15 August, the earth shook".

В ЛѢТО 6899 АВГУСТА 15 ЗЕМЛЯ ТРЯСУЛАСЯ.

The earthquake is not recorded by Downey (1955), but is recorded, though only indirectly, by Wirth (1966, pp.395, 398). It has been suggested that the report is an interpolation, or else an addition consisting of pre-existing chronographical material (Majeska 1984, p.104, note 159). And it is not even certain that the place where the earthquake was felt was Constantinople (Seemann 1967, p.353).

Ignatius of Smolensk's report is in any case somewhat problematical (always assuming that the earthquake really was felt at Constantinople) and doubts arise as to its reliability, because of the strange lack of Byzantine references to an earthquake at that period.

▲ 1391 08 15

localities	lat.	long.	I
Istanbul	41 02	28 57	F

< 235 > 1392 April 13 Cyprus

source *Notula* in Darrouzès (1951, p.42) and in Constantinides and Browning (1993, p.77)

catalogues d. Wirth (1966); Evangelatou-Notara (1993)

On 13 April 1392, the island of Cyprus was struck by an earthquake which the sources describe as "great and terrifying", but without specifying its effects.

Information about the earthquake is to be found in a *Notula* in Paris manuscript *græcus* 1588, at fol.194v. (published in Darrouzès 1951, p.42 and in Constantinides and Browning 1993, p.77):

"on the same day [13 April] there was a great and terrifying earthquake, in the year 6900 [1 September 1391 - 31 August 1392], on a Sunday".

τῆ αὐτῆ ἡμέρᾳ ἐγένετο σισμὸς μέγας καὶ φοβερὸς, ἔτους 6900, ἡμέρᾳ κυριακῆ.

However, as Evangelatou-Notara (1993, pp.92-3) points out, 13 April 1392 was a Saturday, not a Sunday. Some doubt therefore remains as to whether this may be a reference to the earthquake of 29 April 1397, which was indeed a Sunday.

▲ 1392 04 13

localities	lat.	long.	I
Cyprus	35 00	33 00	IX?

< 236 > 1395 October Vodena [Greece]
> overflow of a lake?, landslides? <

sources *Chron. min. Byz.* 69.7; 60a.7 (in Schreiner 1975, p.530; 1979, p.151); Ign. Smol., *Abbrev.*, p.32
historiography Schreiner (1977); Kravari (1989)
literature Stiros (1998); Ambraseys (1999)
catalogues, d. Evangelatou-Notara (1993); *Papazachos and Papazachou (1997)

In October 1395 a destructive earthquake struck the city of Vodena (present-day Edhessa) in northern Greece, not far from the frontier with the present-day Republic of Macedonia. It was strongly felt on Mount Athos and the surrounding area. The earthquake may have caused water to overflow from a lake near Edhessa, since the city was flooded.

The sources are two short chronicles in Greek (published in Schreiner 1975, p.530, 1979, p.151), as well as the Russian traveller Ignatius of Smolensk, who is a contemporary source. The chronicle known as *Chronicle 69* records:

"In the year 6904 [1 September 1395 – 31 August 1396] there was an earthquake and Bodena collapsed in ruins".

ἔτους ς'λδ' ἔγινε σεισμός καὶ ἐχάλασαν τὰ Βοδενά.

The chronicle in ms. 798 in the National Library in Athens gives information at fol.420v, similar to that in the above chronicle, and adds that Bodena "sank" (ἐβυθίσθησαν): "when the great earthquake occurred and Bodena was destroyed and sank in the year 6904".

ὅταν ἔγινεν ὁ σεισμός ὁ μέγας καὶ ἐχάλασαν καὶ ἐβυθίσθησαν τὰ Βοδανὰ ἔτους ς'λδ'.

In his *Abbreviated Chronicle*, Ignatius of Smolensk records not only the Bodena earthquake but also some collapses at Thessaloniki, very probably caused by an earthquake slightly later than the one at Edhessa (see entry < 238 >):

"In the year 6904 [1 September 1395 – 31 August 1396], in the month of October, the earth was violently shaken on the Holy Mountain [Mount Athos] and in outlying places, and some parts of the town of Selunij [Solun] collapsed in ruins. [Also] in this region stood the town of the waters [Vodena] – that is [indeed] what it was called – which sank beneath the ground with all [its inhabitants] because of the tremor. There was a lake near the town [Vodena] which overflowed into the urban area and flooded the whole place".

Въ лѣто 6904 мѣсяца Октября вѣстрясла земля вельми въ Святѣй горѣ и въ внѣшнихъ странахъ, и части нѣкіа града Селуня падоша, и въ той же странѣ бысть градъ Водень, тако нарицаемъ бѣше, и погрязнѣвъ въ землю съ вѣми отъ труса. Бѣше же въскрай града того озеро, и изліася на мѣсто, идеже градъ, и исполнися езеро все то мѣсто. И паки потрясѣся земля Ноября въ 30 день, такоже и бѣ 13, и Генваря въ 7 день въ 20 часъ ноши и июня въ 1 въ 2 часъ ноши, и абгыста 6 въ 1 и часъ ноши, и ту прѣста.

Since the nearest lake to Edhessa is Límni Vegorritidis, 20 km to the west of the town, that may be the one referred to in the source. Kravari (1989, p.68) writes that Edhessa was destroyed in an earthquake in 1395 or 1396. Evangelatou-Notara (1993, pp.93-4) thinks the Edhessa earthquake, which she dates to 1395-1396, and that of Mount Athos, which she dates to 1396, were separate events, but she makes no further comment. Papazachos and Papazachou (1997, p.194), on the other hand, think that the references to Edhessa, Thessaloniki and Mount Athos concern a single seismic event, which they date to October 1395. Ambraseys (1999, pp.293-4) identifies two principal seismic events, one of which struck Edhessa in October 1395, while the other struck Solun (now Thessaloniki) in November of the same year. Although there remains some

uncertainly about Ignatius of Smolensk's text, we think this last interpretation of the available sources is the most convincing.

▲ 1395 10 -

localities	lat.	long.	I	localities	lat.	long.	I
Edhessa	40 48	22 03	X?	Mount Athos	40 10	24 19	V

< 237 > 1395 November 12 Cyprus

source *Notula* in Darrouzès (1953, p.89, no.10)
 catalogues d. Wirth (1966); Evangelatou-Notara (1993)

On 12 November 1395, the island of Cyprus was struck by an earthquake, the effects of which are not specified in the sources. A brief item of information about it is to be found in a *Notula* in Paris manuscript *graecus* 1589, at fol.114v. (in Darrouzès 1953, p.89, no.10): "and on Friday there was an earthquake, at the first hour of the night, in the year of Our Lord 1395...".

καὶ τὴν παρασκευῆ(ν) ἐγένετο σεισμός ἤς τὴν α' ὄρ(αν) τῆς νικτοῦ ἐνχρονίας τοῦ Χ(ριστο)ῦ ,ατρε'...

According to Wirth (1966, p.395), the Friday in question might be 18 November 1395, but that day was in fact a Thursday. Evangelatou-Notara (1993, p.93) is uncertain as to whether the date was 12 or 19 November. The context of the *Notula* is the burial of *papas* Vasilis Armenopoulos, which took place on 13 November 1395. It is therefore likely that the earthquake occurred the day before: Friday, 12 November.

▲ 1395 11 12 15:45 UT

localities	lat.	long.	I
■ Cyprus	35 00	33 00	F

< 238 > 1395 November 30 Solun [Greece]

< 239 > 1395 December 13 Mount Athos

< 240 > 1396 January 7 Mount Athos

< 241 > 1396 June 1 Mount Athos

< 242 > 1396 August 1 Mount Athos

source Ign. Smol., *Abbrev.*, p.32
 literature Ambraseys (1999)
 catalogues Evangelatou-Notara (1993)

While describing the Edhessa earthquake of October 1395, the Russian traveller Ignatius of Smolensk — a contemporary source — writes that certain parts of the Greek city of Solun (present-day Thessaloniki, on the west coast of the Chalcidice peninsula) collapsed. It is very likely that this was a separate earthquake from the one which struck Edhessa on October 1395 (see above < 236 >) and that it occurred on 30 November in that same year 1395. It was felt on Mount Athos, where other earthquakes were also

experienced perhaps on 13 December 1395, and on 7 January, 1 June and 6 August 1396 – probably aftershocks of the Thessaloniki earthquake. The text of Ignatius of Smolensk's *Abbreviated Chronicle* is as follows: "In the year 6904 [1 September 1395 – 31 August 1396], in the month of October, the earth was violently shaken on the Holy Mountain [Mount Athos] and in outlying places, and some parts of the town of Selunij [Solun] [Thessaloniki] collapsed in ruins. [...] And the earth was shaken again on 30th November, and also on 13th, on 7 January at the twentieth hour of the night, and on 1st June at the second hour of the night, and on 6 August at the first hour of the night, and then [the earthquake] stopped" (transl. I. Dorfmann-Lazarev).

Въ лѣто 6904 мѣсяца Октября вѣстрясеа земля вельми въ Святѣй горѣ и въ внѣшнихъ странахъ, и части нѣкіа града Селуня падоша, и въ той же странѣ бысть градъ Водень, тако нарицаемъ бѣше, и погрязнѣвъ въ землю съ вѣми отъ труса. Бѣше же въскрай града того озеро, и изліася на мѣсто, идеже градъ, и исполнися езеро все то мѣсто. И паки погрязеа земля Ноября въ 30 день, такоже и бѣ 13, и Генваря въ 7 день въ 20 часъ ноши и юня въ 1 въ 2 часъ ноши, и абгыста 6 въ 1 и часъ ноши, и ту преста.

▲								
1395 11 30								
localities	lat.	long.		I	localities	lat.	long.	I
Thessaloniki	40 38	22 56	VIII-IX		Mount Athos	40 10	24 19	IV-V
1395 12 13								
localities	lat.	long.		I				
Mount Athos	40 10	24 19		IV-V				
1396 01 07	12:00 UT							
localities	lat.	long.		I				
Mount Athos	40 10	24 19		IV-V				
1396 06 01	20:30 UT							
localities	lat.	long.		I				
Mount Athos	40 10	24 19		IV-V				
1396 08 01	19:00 UT							
localities	lat.	long.		I				
Mount Athos	40 10	24 19		IV-V				

< 243 > **1396 November 26 Monza [northern Italy]**

- source 2 Anonymous, *La città di Monza* (ed. Mezzotti 1838-40), p.72
- historiography Corio (1503); Buoni (1571); Bardi (1581); Dalla Corte (1594); Schiavina (ed.1863); Tovazzi (ed. 1986); Calvi (1676-77); Biancolini (1749); Morisi Guerra (1978)
- catalogues d. Pacca [1563-1580]; Bonito (1691); Goiran (1880); Mercalli (1883); Agnelli (1895); Mercalli (1897); Baratta (1901); *Boschi *et al.* (1997, 2000)
- catalogues p. Giorgetti and Iaccarino (1971); Carrozzo *et al.* (1973); Postpischl (1985); CPTI (1999)

On 26 November 1396, a strong earthquake struck Monza, damaging a few of houses. The only reference to this earthquake occurs in a late anonymous local chronicle of 18th century, probably compiled according to sources now lost. It states: "1396. Matteo da Campione, who designed the façade of our basilica, died [...]. On 26 November a strong shock was felt and some houses were damaged.

1396. *Passò ad altra vita Matteo da Campione, autore del disegno della facciata della nostra basilica [...]. Ai 26 di novembre si senti grave scossa di terremoto e rovinarono alcune case.*

This chronicle was first used by Mercalli (1883). The historiographical tradition derived information about this earthquake from the Milanese historian Corio (1503) who, in compiling his work, was able to use the ducal archives in Milan, which Ludovico il Moro placed at his disposal, as well as church archives, medieval chronicles and chronological works circulating at the time in erudite quarters. In his *Historia*, Corio mentions in general terms a "fearful" earthquake which apparently caused buildings to collapse and was felt almost throughout Lombardy. The reference to the earthquake in Corio raises some problems, however, the chief of which is the fact that his indication of time and place does not coincide with that in the Monza chronicle quoted above.

Corio writes as follows:

"in the year 1397: on the day devoted to the feast of St. Stephen [26 December], at about the third hour, a fearful earthquake occurred almost throughout Lombardy, causing the collapse of many buildings".

Nonagesimo septimo anno sopra mille trecento: nel giorno dedicato ala celebratione di San Stephano circha a l'ora di terza quasi per tutta Lombardia interuenue uno inaudito terremoto mediante il quale ruinorono molti edificii.

Corio thus dates the earthquake to 26 December 1397, and that is the dating which has entered the modern and contemporary seismological tradition (Mercalli misread the year of the earthquake by reversing the last two digits, and so interpreted the evidence in the Monza chronicle as referring to a different earthquake in November 1369, thereby giving rise to a doublet). Corio has often been shown, however, to lack critical sense in taking data from his sources, and the dating problem in his text can be solved by assuming that the one month discrepancy (November/December) is due to Corio's having recorded the date of the document for the date of the earthquake, thereby making a mistake of which there are other examples. The discrepancy in the year derives from the discrepancy in the month, for once he had dated the earthquake to 26 December, Corio adopted the style he had been brought up with (then in use in the Lombardy area), according to which the year began on 25 December, and so dated the earthquake to 1397. Evidence of the earthquake was taken directly from Corio by various 16th and 17th century historiographers, including Calvi (1676-1677), who lies behind the seismological tradition leading to Baratta (1901).

Furthermore, the generic nature of the information provided by Corio favoured the proliferation of presumed local effects in the historiographical sphere. Thus numerous northern Italian historians and scholars either mentioned the earthquake in general terms or extended its effects to their own towns and villages. This explains the presence of a destructive earthquake at Bergamo in recent catalogues. The evidence for this comes in any case from a late source, as we have seen, and Calvi's text is often inaccurate. By contrast, the principal source for 14th century Bergamo, the *Chronicon bergomense guelfo-ghibellinum*, attributed to the notary Castello dei Castelli, who lived from 1345 to 1407 (ed. Capasso and Locatelli 1926-40), is silent on the matter. This is a very detailed source, and includes notes for 26 December 1397 (1396), but there is no word of seismic effects at Bergamo.

The silence of the other contemporary Lombard and Veneto sources means that the epicentral area for this seismic event has never been clearly established.

▲ 1396 11 26

localities	lat.	long.	I
Monza	45 35	09 16	VII-VIII

< 244 > 1397 April 28 Mount Athos [Greece]

< 245 > 1397 April 29 Mount Athos

< 246 > 1397 June 17 Mount Athos

sources Ign. Smol., *Abbrev.*, p.32
catalogues d. Evangelatou-Notara (1993)

Between the end of April and the end of August 1397 Mount Athos was struck by a long seismic sequence. On 28 April there was a very strong earthquake; and on 29 April there was another. Further weak shocks occurred every day until mid-June 1397. On 17 June 1397, between 0:00 and 1:00 UT (at matins), there was another strong earthquake. The shocks ceased at the end of August 1397. In none of these cases are effects stated in detail.

The source is a contemporary one: the Russian traveller Ignatius of Smolensk, who wrote from Mount Athos itself. In an addition to his *Abbreviated Chronicle* he records: "In the year 6905 [1 September 1396 – 31 August 1397], on 28 April [1397], the Saturday of the Week of Light, the Holy Mountain [Mount Athos] was dreadfully shaken like a trembling leaf, and that is still happening, and [the earth] went on shaking for half the day and then half the night, and on Sunday [29 April] morning [the earth] was severely shaken, and until the eighth [week] [the earth] shook slightly every day. On the Sunday of All Saints [17 June 1397], at the hour of matins [the Holy Mountain] was violently shaken, and when the end of the year came, the earthquake stopped" (transl. I.Dorfmann-Lazarev).

Въ лѣто 6905 мѣсяца априлия въ 28 въ субботу свѣлыя недѣли грозно потряселя Святаа гора, подобно осинову листы, и паки повтори, и паки полдни подрыжа, и паки полнощи вѣстряселя, и на утрии въ недѣлю тяжко потряселя, и до 8-ца на всякъ день легко трясаешь; въ недѣлю же бсѣхъ святыхъ въ часъ утрени белми тяжко вѣстряселя, и скончабшуся лѣты томы, и преста трусь.

In the calendar of the Orthodox Church for the year 1397, the "Week of Light" was the first week after Easter, which fell on 22 April. The "eighth" week after Easter was the period from 10 to 16 June. The feast of All Saints (unlike that in the Catholic calendar) falls on the first Sunday after Pentecost, that is to say on 17 June in this case. The strong shock on 29 April 1397 may be the same one that struck the island of Cyprus that day (see the next entry). However, for lack of information about effects and times for both Mount Athos and Cyprus, we have chosen to describe the two events separately. The above is simply very preliminary information about a seismic sequence with an unknown epicentre.

▲
1397 04 28

localities	lat.	long.	I
Mount Athos	40 10	24 19	V-VI

1397 04 29

localities	lat.	long.	I
Mount Athos	40 10	24 19	V-VI

1397 06 17 00:00–1:00 UT

localities	lat.	long.	I
Mount Athos	40 10	24 19	V-VI

< 247 > 1397 April 29 Cyprus

sources Notula in Darrouzès (1951, p.43, no.13) and in Constantinides and Browning (1993, p.77)
catalogues Wirth (1966); Evangelatou-Notara (1993)

On 29 April 1397, the island of Cyprus was struck by an earthquake which is described as "great", but the sources do not specify its effects. Brief information about the earthquake is to be found in a partly defective *Notula* in Paris manuscript *graecus* 1588, fol.203v:

"On the same day [29 April] there occurred a great earthquake, with the result that [...] the [?] shook [...] in the same and all flesh trembled, in the year 6905 [1 September 1396 - 31 August 1397] [...] of Our Lord".

[τῆ αὐτῆ] ἡμέρᾳ ἐγένετο [σεισμός] μέγας ὥστε...τρέμειν τὰ...λα ἐν αὐτῇ καὶ [ἐτρόμαξεν] πᾶσα σὰρξ, ἐν ἔτει ς,ϰε'... τοῦ Χριστοῦ.

▲ 29 04 1397

localities	lat.	long.	I
■ Cyprus	35 00	33 00	NC

< 248 > 1399 July 20 Tusco-Emilian Apennines [northern Italy]

sources 1 [manuscripts] ASMo, Biblioteca, *Mss.*, 162, *Leggendario*, fol.102r.; BNCFlorence, Magliabechiano, VIII, 1488, *Ricordi*, fol.95r.
Pietro di Matt., *Cron.*, p.43; Dominici, *Cron.*, I, p.65; *Ann. Vet. Mutin.*, col.83; Delayto, *Ann.*, col.958; *Cron. Varign.*, III, p.466; *Cron. Bologn.*, III, p.468

sources 2 BUBo, *Mss.*, 429, [Cattani], *Cron.*, fol.32r.; *Mss.*, 1409, *Ist.*, fol.35r.; *Mss.*, 583, *Istor.*, fol.46v; *Mss.*, 81, no.6, Bologn. Marc., *Cron.*, fol.110r.; *Mss.*, 2012, b.VI, no.2, *Framm.*, fol.35v; *Mss.*, 294, Bianchini, *Cron.*, fol.38v; *Mss.*, 1410, *Stor.*, fol.22v; BCABo, *Mss.*, B.3454, *Cron.*; *Mss.*, B.1090, *Squarcio*, fol.41v; *Mss.*, B.2355, Bianchetti, *Cron.*, fol.333; *Mss. Malv.*, 59-63, Bianchetti, *Ann.*, I, fol.378; *Mss. Gozz.*, 61, no.8, *Fragm.*, fol.26v; Pizolpassi, *Summa*, p.182; Tassoni, *Cron.*, p.303; Ghirardacci, *Hist.*, II, p.502; Bianchi, *Cron.*, I, p.227

historiography Alidosi Pasquali (1621); Masini (1666); BUBo, *Mss.*, 770, Ghiselli, *Mem.*; Tiraboschi (1793); AMontese, Giacobazzi, *Storia*; Muzzi (1840-46); Guidicini (1868-73); Dondi (1896); Aleotti (1916); Soli (1931); Bergonzoni (1969, 1983); Banorri (2000)

literature Camassi and Molin (1994); Guidoboni (1997); Guidoboni and Ciuccarelli (2003a)

catalogues d. Bonito (1691); Perrey (1848); Mercalli (1883); De Rossi (1889); Baratta (1899, 1901); Milne (1911); *Boschi *et al.* (1995, 1997, 2000)

catalogues p. Giorgetti and Iaccarino (1971); Carrozzo *et al.* (1973); Postpischl (1985); CPTI (1999)

On 20 July 1399, at about 23:00 UT (the fifth hour of the night, "Italian time"), a powerful and prolonged earthquake struck Modena, causing the collapse of many buildings in the city itself and the surrounding area. At Bologna, many walls collapsed, the battlements on the garden wall of the town hall (formerly *palazzo dei Signori*) were shaken and weakened over a stretch of about 38 m; and on 14 August they collapsed to the ground. In Florence, a tower collapsed between Porta S.Maria and the entrance to the Ponte Vecchio, causing severe damage but no victims.

The earthquake was described as "very great" at Pistoia, but we have no information about effects there. It was also felt at Ferrara, but no damage resulted. About an hour later, there was a second but weaker shock at Modena, which did not cause any damage. According to an early 19th century local historian, various buildings "collapsed" in the earthquake at the old walled hamlet of Dismano, which now no longer exists but was

then near Maserno in the Modenese Apennines. There are two contemporary sources which relate the earthquake to Modena. In the *Annales Veteres Mutinensium*, a compilation by several authors working at the same time, we read: "In the year 1399 [...]. And on Sunday 20 July at the fifth hour, there was a great earthquake, and after the sixth hour had rung, there was another".

De anno MCCCXCIX [...]. Et die XX Iulii die Dominico hora quinta fuit magnus terraemotus et sexta hora sonata fuit alius.

There is a manuscript in the Archivio di Stato at Modena, entitled *Leggendario del Monastero di Santa Chiara in Modena*, in which we read as follows:

"In the year of Our Lord 1399. On Sunday, after the fifth hour, as Monday was approaching, that is to say the twenty-first day of the month of July, there was a very great earthquake, such as had never before occurred in the city of Modena, to the extent that many houses and other buildings collapsed both inside and outside the city. It lasted for a long time. And immediately after the main shock, there was another smaller one, which lasted only a short time".

Anno domini MCCCLXXXIX. Die dominica post horam quintam noctis veniente ad diem lune, silicet vigesimam primam mensis Julij, fuit Maximus terremotus sicuti forte unquam fuit in civitate Mutine, in tantum quod multe domus et multa hedifitia ceciderunt tam in civitate quod extra civitatem. Et duravit per maximum spatium. Et immediate post illud maximum venit aliut parvum et modicum duravit.

20 July was indeed a Sunday in 1399. Alessandro Tassoni, a 16th century chronicler from Modena, repeats word for word the information from the *Annales Veteres Mutinensium*. For Bologna, we have the account of a contemporary author who experienced the earthquake himself. This was Pietro di Mattiolo, parish priest of the church of S.Michele del Mercato di Mezzo (the church no longer exists). He writes:

"In 1399, on the Sunday night between 20 and 21 July, after the fifth hour had struck, there were such great earthquakes in the city of Bologna that the whole world seemed to be violently shaking and about to collapse; and the great shaking of the tower with the great bells in the town hall of Bologna caused the great bell to ring several times of its own accord, and there was seen in the sky a great redness which seemed like a fiery flame flying through the sky, and it terrified the many people who saw it; and more than ten *pertiche* [about 38 m] of the battlements on the garden wall of the *palazzo dei signori* (town hall) were violently shaken and therefore broke; the result being that on 14 of the following month of August these battlements on the said wall collapsed to the ground over a stretch of more than ten *pertiche*".

MCCCLXXXVIII, una domenega de notte sonade le zingue hore tra XX e XXI di del mexe de luglio, venne e sono gli terremoti grandissimi in la cittade de bollogna, in tanto chel pareva che tutto lo mondo se commovesse e andasse in squasso, E per lo gran squassare e commoverse che se la torre da le campane grosse del comune de bollogna la campana grossa sonò alquante botte, senza esser da alchuna persona sonada, E fo vezudo in agliere in cielo uno grandissimo rossore intanto che pareva una fiamma de fuoco che volasse per lo cielo, e fe grandissima paura a molta gente chella vide, E più de diexe pertighe di merli del muro delorto e del palazzo di signuri si commosse e si se roppeno per tal partido, che puossa in fine adì XIII del mese dagosto che venne gli detti merli del ditto muro chadeno in terra, per lungheza de più de diexe perteghe de comune.

There are two 15th century chronicles, the *Varignana* and the *Bolognetti*, which provide information about the effects of the earthquake at Bologna, though in briefer form. The first of these records:

"1399. There was so great an earthquake at Bologna on 20 July that many walls in Bologna collapsed, as did many battlements on the *palazzo dei Signori*, that is to say on the garden side".

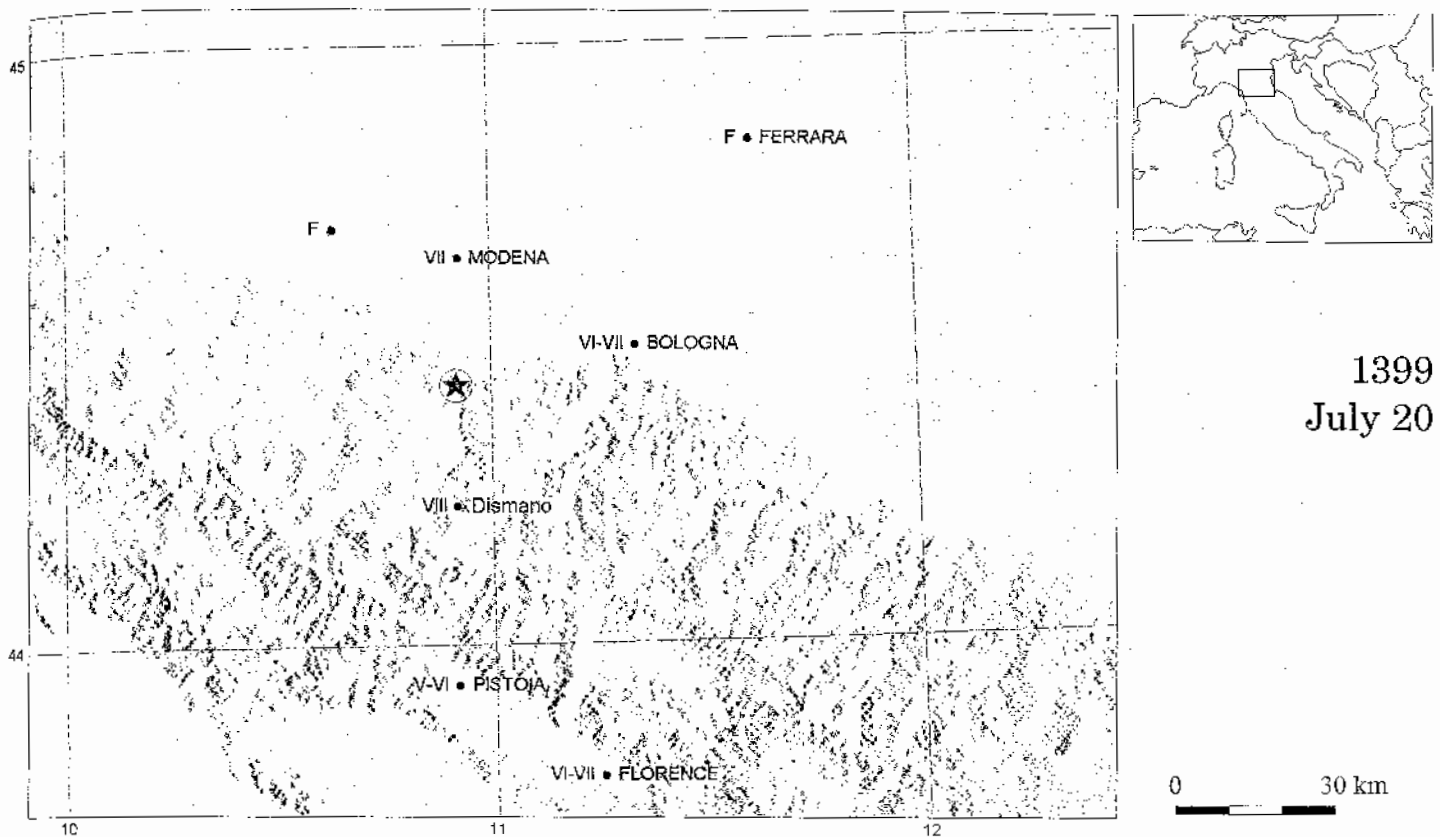


fig. 100

1399. – *Uno tremuoto fuo sì grande in Bologna adì xx del mese de luglio che molte mure cadeno a terra in Bologna e molti merli del palazzo di Signori, zoè dal lato de l'orto, andono a terra.*

The *Bolognetti* chronicle provides a report which is very similar to that in the *Varignana* chronicle. The earthquake is also mentioned in the *Historia di Bologna* by the Augustinian monk Cherubino Ghirardacci, a reliable 16th century Bolognese scholar and historian who drew his information from Pietro di Mattiolo's chronicle, though he adds that many houses collapsed — a detail not provided by Pietro di Mattiolo.

There is a *Cronaca* in diary form by Luca Dominici, a notary and politician of Pistoia who lived at the time of the earthquake, in which we find an entry relating to the month of July 1399 where the author refers to "very great" earthquakes at Pistoia, which caused a tower to collapse in Florence:

"[...] in the said month of July [1399] in Pistoia and throughout that territory, one night at the sixth hour there were such very great earthquakes that a tower collapsed in Florence in a street between the Mercato Nuovo and the Ponte Vecchio, placing a number of silk merchants' and goldsmiths' workshops in danger; and it caused great damage, but no one was killed, thank God".

[...] del detto mese di luglio in Pistoia e in tutto questo paese una notte alle 6 ore furono grandissimi tremoti per forma che a Firenze nella via che era Mercato Nuovo e Ponte Vecchio cadde una torre, che pericolò parecchie botteghe di setaroli e orafi e fece grandi danni e non vi morì persona: lodato Iddio.

Although Luca di Dominici's chronicle does not indicate the day of the earthquake, the fact that his report agrees with analogous information about Florence in another Tuscan source where the specific date 20 July is given, suggests that the earthquake

was also felt on that day in Pistoia. This other Tuscan source is an anonymous 15th century manuscript (Biblioteca Nazionale, Florence, *Magliabechiano*, VIII, 1488), the author of which lived somewhere between Florence and Pisa. The text tells us: "In the year 1399 on the night of 20 July at about the fifth hour there were earthquakes in Florence. Many people felt them and a tower collapsed at Porta Santa Maria as well as seven workshops".

Anno 1399 adì 20 di luglio la notte vegnente a ore fere 5 venne tremuoti in Firenze e molti furono che li sentirono e chade 1 torre in porta santa maria e 7 botteghe.

The author then adds a sentence which seems to contradict this, but may in fact be referring to a very wide variety of effects even in a restricted area. In the *Annales Estenses* by Giacomo Delayto, a contemporary author who was a notary and chancellor to Marquis Nicola d'Este, it is recorded that the earthquake was felt at Ferrara: "On 21 July, towards the sixth hour of the night, there was an earthquake at Ferrara".

Die XXI Julii circa horam sextam noctis fuit unus Terraemotus in Ferraria.

It is likely that Giacomo is referring not so much to the second shock recorded in the Modenese sources, but to the stronger shock, that is to say the one which occurred at the fifth hour ("Italian time").

In our opinion, the information about damage at the old hamlet of Dismano must be taken into consideration, though with due caution.

It is provided by the local historian Pellegrino Giacobazzi (18th-19th c.), whose manuscript history of Montese (a village in the province of Modena) may have made use of chronicles which are now lost. However, Giacobazzi does not specify the month and day when the earthquake occurred. This manuscript was used by Banorri (2000) a local historian of Montese.

No results were obtained from research at the Archivio di Stato in Bologna, where the following collections were consulted: *Vicariati*; *Ufficio del Massarolo dei lavori del Comune*; *Ufficio dei fertilizi e di munizione dei castelli*; *Massari del contado*; *Comune, Signorie viscontea, ecclesiastica e bentivolesca*; and *Demaniale*.

▲ 1399 07 20 23:00 UT epicentre 44 26 10 55 I ₀ = VII Me = 5.8 Sites: 7								
localities	lat.	long.	I	localities	lat.	long.	I	
Dismano	44 14	10 55	VIII	Florence	43 47	11 15	VI-VII	
Modena	44 39	10 56	VII	Pistoia	43 56	10 55	V-VI	
Bologna	44 30	11 20	VI-VII	Ferrara	44 50	11 37	F	

(249) 1399 September 20 Damascus [Syria]

sources Ibn Hajar, *Inba'*, II, p.92
 literature Taher (1979)
 catalogues p. Poirier and Taher (1980); al-Hakeem (1988)

On 20 September 1399, a slight earthquake was felt at Damascus. It is recorded by the contemporary historian Ibn Hajar (1372-1449): "During the night of 17 *Muharram*, the earth shook at Damascus; it was a slight earthquake".

في ليلة السابع عشر من المحرم زلزلت دمشق وكانت زلزلة لطيفة.

▲ 1399 09 20 at night			
localities	lat.	long.	I
Damascus	33 30	36 19	III-IV

< 250 > 1399 October 21 Iadera [Croatia]

< 251 > 1399 November 6 Iadera

source Paolo de Paolo, *Mem.*, p.430
literature Albini (2004)
catalogues d. Kispatic (1891-92)
catalogues p. Shebalin *et al.* (1974)

This earthquake is listed in Kispatic's catalogue (1891-92) and recorded in the parametric catalogue of Shebalin *et al.* (1974), but studies are still at a preliminary stage. The review carried out by Albini (2004) considers the single source currently known to record it. All our information about this and another three earthquakes felt at Iadera (present-day Zadar) in the late 14th and early 15th century (see entries < 229 >, < 233 >, < 261 > in this catalogue) come from the sole contemporary author to record them, namely Paolo de Paolo. He lived at Zadar and wrote a chronicle recording events at the city between 1371 and 1407. However, no manuscript copies or critical editions of Paolo de Paolo's work survive; all we have is a 1668 edition published by Giovanni Lucio, and we do not know whether it is complete and/or revised. In Thomas Trattner's republished edition of 1758, Paolo de Paolo's text is shorter than in Lucio's 1668 edition, so it is difficult to assess this "lost" source.

Paolo de Paolo records the exact time of a seismic sequence between 21 October and 6 November 1399, but has nothing to say about effects. Consequently, any attribution of intensity is based solely on the words used to describe the shocks themselves. At about 15:00 UT on 21 October, there was an earthquake described in the source as "very great" (*maximus*): there were seven strong shocks over a short period, the first of which is described as the "worst" (*terribilissimus*); and there were numerous further shocks the following night. Throughout the following thirteen days, that is to say, until 2 November, shocks were felt during the day and at night. Two of the latter were probably stronger than the others since Paolo de Paolo notes their date and time, but he adds no adjective which might throw light on their intensity. They occurred on 25 October at about 1:00 UT. After three days of respite, the last shock was felt at about 15:00 UT on 6 November, and is described as "great and terrible" (*magnus et terribilis*).

Paolo de Paolo's text, as published by Lucio (1668, p.430) is the following:

"1399. [...] On 21 October in that same year, towards the hour of vespers, there was a very great earthquake at Iadera with seven successive shocks, of which the first was the most terrible. And the following night there were further shocks, and again on the night of 24 of that month. There were shocks around midnight and at about the hour of matins, and then every day, by day and night, for thirteen days. Then the shocks ceased until 6 November, when there was a single great and terrible earthquake at about the hour of Vespers".

1399. [...] Eodem anno die 21 Octobris hora quasi vesperarum fuit maximus terramotus in Iadra bene septies successive, ipsorum primus fuit terribilissimus, et nocte sequenti similiter fuerunt plures, et etiam nocte post die 24. ejusdem mensis circa mediam noctem et circa matutinos fuerunt terrae motus, et per omnes dies inter diem, et noctem usque ad dies 13. subsequentis modo cessavit terrae motus, et deinde die 6 Novembris hora quasi vesperarum fuit similiter unus magnus, et terribilis terrae motus.

This earthquake is listed in Shebalin *et al.* (1974) and dated 6 November. It is given an epicentral intensity of grade IX MSK, with doubt expressed by means of a question mark. According to Albini (1994, p.686), the fact that the indication of the date and time of the earthquake does not follow the description of effects, and that the writer goes on to

describe life in the town without recording any substantial change, suggests that the intensity has been overestimated and should be reassessed. However, Albinì does not provide a suggested intensity.

The source does not tell us whether the earthquake was felt elsewhere. It is therefore not possible to attribute an epicentral intensity to the event, but only to the site. We agree with Albinì that it must be much lower than the value given in Shebalin *et al.* (1974).

▲
1399 10 21 15:00 UT
localities lat. long. I
Zadar 44 07 15 15 VI-VII

1399 11 06 15:00 UT
localities lat. long. I
Zadar 44 07 15 15 V-VI

< 252 > **1400 January Brusa [north-western Turkey]**

sources 1 *Chron. min. Byz.* 91.8, in Schreiner (1975, p.623); *Notula* in Schreiner (1977, p.616, no.60) previously published in Lampros (1910, p.149, no.90)
historiography Montfaucon (1739); Schreiner (1977)
catalogues d. Grumel (1958); Ambraseys and Finkel (1991); Evangelatou-Notara (1993)

On an unspecified day, perhaps in January of the year 1400, the town of Brusa (now Bursa) suffered serious damage, probably in an earthquake described as "great". Our uncertainty about this earthquake derives from the fact that the chronicle source which mentions Brusa is extremely brief and does not explicitly state the cause of the damage. It is preserved in Sinai ms. (St.Cath.) 461, fol.34v. (published in Schreiner 1975, no.91): "In the year 6908 [1 September 1399 – 31 August 1400] Brusa collapsed".

εὗρη' ἐχαλάσθη ἡ Μπροῦσα.

According to Schreiner (1977, p.366), this item of information is to be related to the *Notula* in Vienna manuscript *Theologie graecus* 104, fol.222v., published in Schreiner (1977, p.616, no.60) and previously in Lampros (1910, p.149, no.90):

"A great earthquake occurred during the reign of the very pious Emperor Manuel, son of John Palaeologus, in the year 6908, in the month of January, in the eighth indiction [1 September 1399 – 31 August 1400]."

ἐγένετο σεισμός μέγας ἐπὶ τῆς βασιλείας τοῦ εὐσεβεστάτου βασιλέως κυρίου Μανουήλ, υἱοῦ Ἰωάννου τοῦ Παλαιολόγου, ἐπὶ ἔτους εὗρη', μηνὶ ἰανουαρίῳ, ἰνδικτιῶνος η'.

The above *Notula* gives the month of the earthquake (January 1400), but does not provide any information as to its location.

Evangelatou-Notara (1993, pp.95-6), however, chooses to identify two events: an earthquake at Brusa in 1399-1400 and another in January 1400 at an unknown location. According to Ambraseys and Finkel (1991, p.537), the earthquake was strongly felt at Constantinople — an item of information which comes from Montfaucon (1739, I, p.533). Montfaucon states that his information about the earthquake at Constantinople comes from fol.222 of codex *CCXL bombycinus Graecus* in the

"S.Caesareae Majestatis Vindobonensi" library; but it should be noted that this same item of information from the same source, now referred to as *Theologie graecus* 104,

(fol.222v.) appears in Schreiner (1977, p.616, no.60) having previously been published in Lampros (1910, p.149, no.90). In Schreiner's edition, however, Constantinople is not explicitly mentioned. This means that earthquake effects at Constantinople are a conjecture on the part of Montfaucon (1739) — plausible perhaps, but not explicitly recorded in the source.

▲ 1400 01 -

localities	lat.	long.	I
Bursa	40 11	29 04	VIII-IX

< 253 > 1402 July Gulf of Corinth [Greece]

> tsunami, landslides, fissures, increased flow in springs <

sources Contarini Giovanni, Letter, 30 August 1402, in Thiriet (1959, pp.6-7); Delayto, *Chron.*, col.974
 historiography Evangelatou-Notara (1986)
 literature Ambraseys and Melville (1995)
 catalogues d. Perrey (1850); Mallet (1853); Evangelatou-Notara (1993); *Papazachos and Papazachou (1997)
 catalogues p. Papadopoulos (2000; 2003)
 catalogues Ts Ambraseys (1962); Antonopoulos (1980); Soloviev *et al.* (2000)

This earthquake, accompanied by a tsunami, has been wrongly located in the seismological tradition. Thus Perrey (1850, p.20) and Mallet (1853, p.45), basing themselves on Delayto's chronicle, wrongly place it in Syria. Ambraseys (1962, p.901) and Antonopoulos (1980, pp.190-1) follow Mallet, placing the earthquake on the coast of Syria and Asia Minor, and dating it to 16 November 1403.

This mistake of location was subsequently corrected in Ambraseys and Melville (1995, p.341), but some confusion remains as to the time and place of the event. The tsunami catalogue of Soloviev *et al.* (2000, p.40) relies on two different traditions for the event, and in effect creates a doublet: on the authority of Papazachos and Papazachou (1997) it lists a tsunami in June 1402 and locates it in the Gulf of Corinth; and on the strength of the tradition leading from Perrey (1850) and Mallet (1853) to Ambraseys (1962) and Antonopoulos (1980), it also lists a tsunami on 16 November 1403, locating it on the coast of Syria and Palestine. The information in Papadopoulos (2003, pp.442-43) comes from Evangelatou-Notara (1986), who dates the earthquake to June in the year 1402. There is a primary source, however, which is given in Thiriet (1959, pp.6-7), and was used by Evangelatou-Notara in her study (1986) and later in her catalogue (Evangelatou-Notara 1993, pp.96-7), which has made it possible to establish a picture of effects for this earthquake, and to locate it correctly.

Earthquake effects

In July 1402, a strong earthquake struck the Gulf of Corinth in central Greece. The following localities were struck on the southern shores of the Gulf (northern Peloponnese): most of the fortress of Vostitsa (present-day Aigion) collapsed, as well as most buildings in its territory; the fortress of Diakoftò, was completely razed to the ground, together with the village and the mountain on which they stood; communications were interrupted; the fortress of Zakholi (present-day Evrostina), which stood on a very high mountain, collapsed, and the mountain itself split open; the fortress of Xylokastron was completely razed to the ground, and there were also extensive landslips or landslides on the mountain where it stood, and many people were killed. The slopes of the northern coast of the Gulf of Corinth were also affected: some battlements fell from the fortress at Salona (now Amfissa); Vitrinitsa (now Tolofon) may also have suffered damage, but no details are known about effects there.

Tsunami and environmental effects

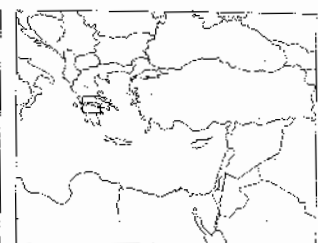
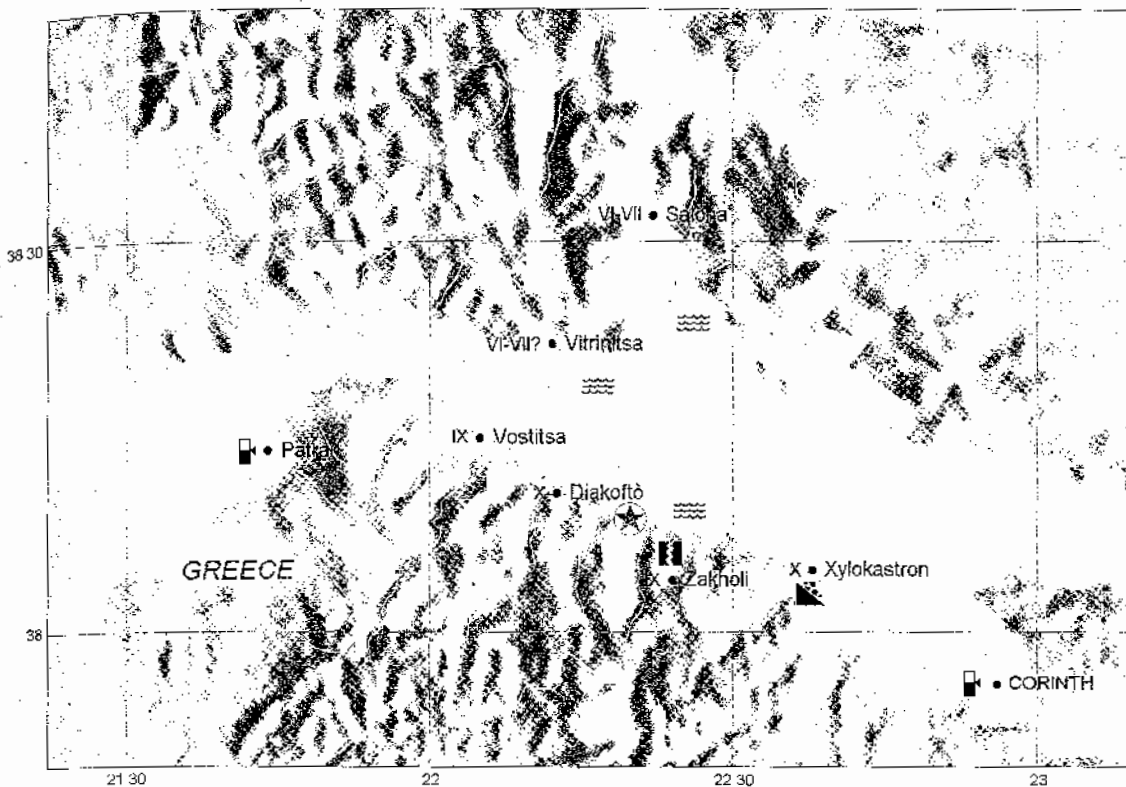
The earthquake was accompanied by a strong tsunami, which struck both shores of the Gulf of Corinth. On the southern side, at a locality not identified in the sources, the sea penetrated about 200 metres inland, and when it withdrew, fish were left lying on the shore. The tsunami was more violent on the northern shore: first the sea drew back about 870 metres from the coast, and then it flowed back over the shore, penetrating more than 200 metres, destroying the wheat crop which the local people, citizens of the Byzantine Empire, were reaping, and forcing them to take refuge on a small hill. According to the source, this phenomenon occurred twice. When the sea grew calm again, many fish were found on the shore. The sources specify two localities on the northern coast in particular as having been struck by the tsunami: Salona (Amfissa) and Vitrinitza (Tolofon).

At Patras and Corinth, there was an increased flow of water from springs. As already pointed out, at Zakholi (Evrostina), which stood on a very high mountain, the mountain itself split open into four parts, and at Xylokastron there were also extensive landslips or landslides on the mountain where it stood.

Historical sources

Information about the earthquake and the tsunami are to be found in two sources: a letter in Venetian vernacular written about a month after the earthquake, and a contemporary Latin chronicle. The letter was written on 30 August 1402 by Giovanni (Zuane) Contarini, and reports evidence from the *Capitano del Golfo*, an official responsible for coordinating naval affairs of a military nature. It was sent to Domenico Soranzo, the writer's cousin, who was at Damascus on business and received the letter on 9 October 1402. Contarini writes:

"The *Capitano del Golfo* has written to us here, telling astonishing news of the Morea [the Peloponnese]; this is what he writes: the castle and most of the town of Gustiga [Vostitsa] lie in ruins, the castle of Diocopa [Diakoftò] in the land of the Greeks, has completely collapsed, with the village and the mountain, and it is impossible to pass that way. Another fortress, called Sachuli [Zakholi], at the top of another mountain, is in ruins, and the mountain, which is very high, has split into four parts; another castle, called Chisilocastro [Xylokastron] lies in ruins along with the whole mountain, and many people have been killed [...] We are also told that there was a storm with a great deal of lightning: towns and mountains near the coast lie in ruins and the sea is now lapping inland more than three bowshots [c. 1200 m]; [the *Capitano*] also says that the sea advanced more than half a bowshot inland [c. 200 m], and has remained in some caves, and in some places salt water like stagnant water has been left behind. [...] because of the water rising, some fish were left on land, and were gathered up by those who were nearby, who bear witness that it really did happen. The fresh water in towns and villages has increased many times beyond the usual rate of flow, and these things happened from Patras to Corinth; in the region of Salona and Vitrinitza, the earthquake seems to have been more in the sea than on land, judging by the great roaring and roughness of the sea: [...] the sea floor was seen to be uncovered over more than half a mile [c. 870 m], and the sea rushed back and rose more than half a bowshot [c. 200 m], as far as where wheat was being reaped, and the reapers, citizens of the Byzantine Empire, took refuge on a low hill, and these people said that the sea carried off the wheat which they were reaping, as well as other stacks of wheat which were near the sea [...] And then the sea returned to its normal level, and it did this twice; and then the sea withdrew and the reapers, feeling safe, came down to the shore and found quantities of various kinds of fish. The earthquake also affected the territory of Salona, and brought down some battlements, and at that time near Salona, a fire burned a mountain, which became all dried up. And on that day the weather was very bad, with lightning and storm, and more than 500 houses were consumed by fire, and



1402
July

0 30 km

fig. 101

it was thought to have been caused by lightning! There were such large hailstones that they damaged vineyards and other things on the land, and killed all the animals that were out in the open. [The *Capitano*] said other incredible things, but all the things set out above were seen by a number of people. And this, writes our *Capitano*, happened in July".

El Capitano del Golfo a scritto in questa terra como in la Morea esta de gran novitade; scrive cuxi: el se derupado el castelo e la tera de Gustiga per la maor parte, el castelo del Diocopa in tera dei Griexi, el paeso con la montagna del tuto e derupada, e dela non se puo passar. Un'altra forteza, chiamata Sachuli, la qual iera in zima d'un altra montagna s'e derupada, e la montagna, la qual se altissima, se averta in quatro parti; un'altro castelo chiamato Chisilocastro e derupado tuto con la montagna, e morte asai persone [...] Ben se dixte che tempesta fo e fo lampi asai: a preso la marina e derupado tere e montagne, et al presente bate il mar plu de tre balestrate; ancor dise chel mar arese plu de meta balestrada et e romaxo in algune caverne, in algun luogo de laqua salsa che e simile che laqua morta. [...] per lo asender del aqua, romase del pesce in tera, el qual fo tolto per quei era visini che testimonia esser vero. Le aque dolze dei luogi in fine a multiplicado molto plui de luxado, e queste cose e seguide de Patras fin al Choranto; in le parte de la Suola e de la Vetronissa par sia stado el teramoto plui in mar che in tera per lo gran brombolar et verzer del mar: [...] fo vezudo i fondi plu de meta mio [miglio] de scoperto, et dapuo torna con impeto et asese plu de meta trar de balestro in fin lagune ore in le qual se tibiava formento e romeni che tibiava se reduse suso uno monticelo, i qual romeni dixte chel mar tolse quel formento el qual i tibiava, e pluxor altre mote de formento, lequal iera deli intorno el mar [...] E dapuo el mar torno in so esser e quasto fo per do fiade; e dapuo defeso il mar, i romeni fo seguro e vene a la marina e trovo diverse zenerazion de pesci in quantitate. El teramoto fo eziandio in tera dela Suola e derupa alguni merli, in quella ora a preso

la Suola un fuoco et arse una montagna laqual e deventada tuta arida. Et in qual di fo malissimo tempo de lampi e de tempesta, arsese plui de zinquo cento case dal fuoco, immaginase fosse da lampo! Fo tempesta si grosa che la consuma vigne et altre cose de tera et a amazado tute bestie se trova eser al scoperto. Dise altre cose incredibile, ma tute le sora dite cose e sia vezude per plui persone. Et questo scrive el nostro Capetanio eser stado de luio.

The information in the contemporary chronicle of Giacomo Delayto, a notary and chancery official, is much less precise. He simply locates the earthquake in Greece: "In that same year 1402, in lands overseas, and especially in certain areas of Greece, there were such powerful and terrible earthquakes that the walls and buildings of many towns and fortified villages were reduced to ruins; and many mountains split open and splintered into fragments; some rocks and villages were consumed by flames and reduced to ashes, having been struck by fire from heaven; the sea level rose up to half a bowshot [c.200 m] higher than usual, and in some places, because of the sea-wave, it withdrew about half a mile [c.870 m], and then threw itself violently upon the shore again, and once more concealed the sea floor".

Eodem anno MCCCCII, in partibus Ultramarinis, et specialiter in certis Regionibus Graeciae, fuerunt Terraemotus adeo validi et terribiles, quod multarum Civitatum et Oppidorum moenia et aedificia corruerunt; multi quoque montes scissi et delapsi; nonnullae rupes et villae igne coelesti in flammam et cinerem conversae; mare excrevit altius solito per dimidiam balistratam, et in certis locis ita secessit ex Terraemotu maritimo, quod fundus apparuit per medium miliare, et deinde cum impetu rediit, et iuxta pristinum fundum operuit.

▲ 1402 07 - ☉ = 38 09 22 20 I₀ = X Me = 6.3 Sites: 6 EE: 4 Ts

localities	lat.	long.	I	localities	lat.	long.	I
Diakoftò	38 11	22 13	X	Amfissa	38 32	22 22	VI-VII Ts
Xylokastron	38 05	22 38	X EE	Tolofon	38 22	22 12	VI-VII? Ts
Aigion	38 15	22 05	IX	Corinth	37 56	22 56	EE
Evrostina	38 04	22 24	IX EE	Patras	38 14	21 44	EE

< 254 > 1402 shortly after July 28 Constantinople [north-western Turkey]

sources 1 *Chron. min. Byz.*, 49.10 in (Schreiner 1975, p.352)

historiography Schreiner (1977)

catalogues d. Evangelatou-Notara (1993); *Papazachos and Papazachou (1997)

Shortly after 28 July 1402, Constantinople (now Istanbul) was struck by an earthquake described by the source as "great", but without any effects being specified. There is information about the earthquake in a *Notula* by a scribe named Dionysius in manuscript *graecus* 173, fol.138r. in the Staatsbibliothek, Berlin. The *Notula* was added to the chronicle called *Chronicon breve Thessalonicense* of which Dionysius himself was the copyist (Schreiner 1975, p.352, no.10). After recording the battle of Ankara (28 July 1402), in which Tamerlane defeated the Turks, the writer — who was at Constantinople at the time — adds:

"I, Dionysius, was then at Constantinople, and I saw an unusual spectacle, for refugees of every people, race and language arrived there. Then there was a great earthquake, and lightning struck".

ὅτε καὶ ἐγὼ ὁ Διονύσιος εὐρέθην τῆνικαὐτὰ ἐν Κωνσταντινουπόλει, καὶ εἶδον θέαμα ξένον, ὅπως ἅπαν γένος καὶ ἔθνος καὶ γλώσσα ἔφθασεν φυγὰς ἐν Κωνσταντινουπόλει. τότε γὰρ καὶ γέγονεν σεισμὸς ἐκεῖσε μέγας, καὶ κεραυνὸς ἔπεσεν.

Although it is not possible to put an exact date on the earthquake, it must have occurred shortly after 28 July 1402, when the battle of Ankara took place.

▲ 1402 shortly after 07 28

localities	lat.	long.	I
Istanbul	41 02	28 57	VI-VII?

< 255 > 1403 December 18 Aleppo [north-western Syria]

< 256 > 1404 February 20 Al-Marqab

sources	al-'Ayni, <i>'Iqd</i> , XXV, p.203; al-Maqrizi, <i>al-Suluk</i> , III/3, p.1122; Ibn Hajar, <i>Inba'</i> , II, p.262; Ibn al-Shihna, <i>Rawdat</i> , in Taher (1979, part in Arabic, p.199)
literature	Taher (1979); Poirier <i>et al.</i> (1980); Ambraseys and Melville (1995)
catalogues d.	Sieberg (1932a)
catalogues p.	Poirier and Taher (1980); al-Hakeem (1988)

On 20 February 1404, a destructive earthquake struck Syria, particularly affecting the cities of Aleppo and Tripoli (or Tarabulus) and their provinces. A great deal of damage occurred at Aleppo, and many buildings collapsed at Tripoli, as did part of the castle of Al-Marqab. The most violent earthquake at Aleppo was followed by a sequence of less powerful shocks which lasted until early July 1404, especially to the west of Aleppo. There had already been an earthquake there on 18 December 1403 about midday, but it did not cause any damage.

Information about this earthquake is to be found in the works of four contemporary Arab historians and men of letters. Ibn Hajar and Ibn al-Shihna tell only of effects at Aleppo. Ibn Hajar writes:

"On 8 *Sha'ban* [20 February 1404] the earth shook violently at Aleppo and in its province, causing much destruction. Before that, there had been an earthquake on 3 *Jumada II* [18 December 1403], at midday. Earthquakes followed throughout the year, especially in the west".

في الثامن من شعبان زلزلت حلب وأعمالها زلزلة شديدة وخربت أماكن كثيرة وزلزلت قبل ذلك في يوم الجمعة ثالث جمادى الآخرة وقت الاستواء ثم سكنت ثم زلزلت زلازل كثيرة متفرقة في طول السنة وكانت الزلازل بالجهة الغربية منها أكثر.

Ibn al-Shihna reports:

"There was a tremendous earthquake at Aleppo and in other provinces; a great many places were destroyed; the earthquake was followed by a second series of lesser shocks. [At that time] earthquakes and wars intensified: and it seems clear to me that the world is approaching its end, and God is sending the earthquakes as a warning to sinners. Scientists explain the earthquakes in terms of the emergence of vapours".

كانت زلزلة عظيمة بحلب وبلاد كثيرة خربت منها أماكن كثيرة وتبع ذلك زلازل عديدة أخف منها فاجتمعت الزلازل والفتن وإنما تكثر الزلازل والفتن بين يدي الساعة والظاهر أن الأمر قد قرب والدنيا على فراخ فالزلازل يخوف الله بها أهل المعاصي ويؤذن بزلزلة القيامة. تنشأ في بعض الأرض كما تنشأ الرعدة للمحموم بإذن الله تعالى وإن الحكماء قالت بأنها بسبب تصاعد الأبخرة.

The wars referred to by the writer are those at the time of the second Mongol invasion led by Tamerlane. The scientific explanation referred to is the Aristotelian *pneuma* theory. The reference in al-'Ayni is briefer:

"Chronicles record a violent earthquake in the province of Tripoli during the last ten

days of *Sha'ban* [13 February – 12 March], causing the destruction of many buildings”.

وردت الأخبار في العشر الأخير من شعبان بحدوث زلزلة عظيمة في البلاد الطرابلسية وانهدمت أبنية كثيرة.

According to al-Maqrizi this earthquake struck Tripoli and Al-Marqab:

“In the month of *Sha'ban* [13 February – 12 March] there was news of an earthquake which had struck Tripoli of the Lebanon and its province; many buildings were destroyed, including one side of the citadel of Marqab”.

في شعبان ورد الخبر بأن طرابلس الشام زلزلت بلادها زلزلة عظيمة هدمت مباني عديدة منها جانب قلعة المرق

In the same passage, al-Maqrizi goes on to list other localities in western Syria which in all probability suffered the effects of a different earthquake: one which occurred on 29 December 1408 (see the entry concerned).

In Poirier and Taher's catalogue (1980, p.2193), the two earthquakes of 1403 and 1404 are listed with some chronological imprecision: the first is dated to 19 instead of 18 December, and no intensity level is attributed to Aleppo; the second is dated to 11 instead of 20 February; it is located at Aleppo with an intensity of grade IX MM. Its effects are described and located in Ambraseys and Melville (1995, pp.338-9), but no seismic parameters are provided.



1403 12 18

localities	lat.	long.	I
Aleppo	36 14	37 10	IV-V?

1404 02 20 Sites: 3

localities	lat.	long.	I	localities	lat.	long.	I
Al-Marqab SYR	35 09	35 57	IX	Tripoli RL	34 26	35 51	VIII
Aleppo SYR	36 14	37 10	VIII				

< 257 > 1404 November 5 – December 4 [*Jumada I* 807 H.]

Aleppo [north-western Syria]

sources Ibn Hajar, *Inba*, II, p.296
 literature Poirier *et al.* (1980); Ambraseys and Melville (1995)
 catalogues p. Poirier and Taher (1980); al-Hakeem (1988)

Between 5 November and 4 December 1404 (a period corresponding to the month of *Jumada I* in the year 807 of the Hegira), an earthquake struck fear into the people of Aleppo, but there was no damage. The first shock was immediately followed by another. Information about the earthquake is to be found in the work of the contemporary Arab historian Ibn Hajar:

“In the month of *Jumada I* [5 November – 4 December 1404] there was a strong earthquake at Aleppo which struck panic into the local people. They implored God's help. When the first shock ceased, another followed, but there was no damage, thanks be to God”.

في جمادى الأولى زلزلت حلب زلزلة عظيمة ففرغ الناس لها ولجأوا إلى الله تعالى فسكنت ثم عاودت مرارا ولم تفسد شيئا والحمد لله.

The description of effects suggests that the intensity (grade VII MM) given by Poirier *et al.* (1980) and Poirier and Taher (1980) is an overestimate.

▲ 1404 11 05 – 12 04 [*Jumada I* 807 H.]

localities	lat.	long.	I
Aleppo	36 14	37 10	V

< 258 > 1404 December 10 – 1405 December 9 [854 A. e.] *Hesat* region
[Armenia-Turkey]

source colophon in Xac'ikyan (1955, I, p.53, no. 54)

historiography Zeyt'unyan (1991)

Between 10 December 1404 and 9 December 1405 (a period corresponding to the year 854 of the Armenian era), a violent earthquake caused extensive damage in the Hesat region, destroying about ten villages. In our present state of knowledge, the region of Hesat cannot be identified. It was probably a region within ancient Armenia — a vast territory stretching from the extreme east of present-day Turkey to western Iran. The source for this event is a colophon in a menology, dated 854 [A. e.], from the monastery of Anclapat. Unfortunately, even the monastery where the codex was written has not been identified. "In this year an earthquake destroyed ten villages in the region of Heshat. In this year, water was so scarce that numerous river mills were shut down".

Յաին ամի շարժն ժ. գիւղ ի շէշատայ երկիր յիրար խառնեաց: Յայսմ ամի ջու ըքն յէնց պակասեցան, որ բազում գետաղաց շաղացք խախտանեցան:

▲ 1404 12 10 – 1405 12 09 [854 A. e.]

localities	lat.	long.	I
Hesat	--	--	IX-X

< 259 > 1406 before November 29 Tat'ev [Armenia]

sources colophons in Xac'ikyan (1955, I, p.57, no.59; p.80, no.77)

historiography Zeyt'unyan (1991)

catalogue d. *Ambraseys and Melville (1982)

On 29 November 1406 a strong earthquake was felt at Tat'ev. An eye-witness in the monastery there recorded that it was strongly felt and buildings swayed. The seismic sequence continued for about a year, but without causing damage to buildings.

The principal evidence for this event is a colophon in a manuscript of Gregory of Tat'ev (no longer in existence), which was written on 29 November 1406 by Tovma Mecop'eci. It ends with two short notes:

"Glory to the mercy and the [?] of my Lord Jesus, who saved us from this earthquake. Oh, astonishing shocks, [the church of the] Holy Apostles in Tat'ev, the bell-towers, and the *kawazan* [staves, or croziers, usually made of wood, metal or bone; in the Armenian liturgy they are presented during ordination] shook today, 29 November".

Փառք ողորմութեան և զթութեան տէր իմ իսուս, որ յայսմ շարժմանէ գերծուցեր զմեզ, զի շարժի իբրն գտերն: Ո զարմանալի շարժմանս, զի շարժի սուրբ Առաքելս Տաթեւու, և զանկախառումն և գացազանս, որ և նոյեմբեր ի՞նչ:

Another colophon, written by the same scribe in Yerevan manuscript 9247, fol.299r, reports:

"Now let me tell of the calamity to those who have doubts and are suspicious. Such was the quantity of our sins that an earthquake struck the earth, and so foundations shook, solid rocks were shattered, and many deacons were found dead; and the whole

earth shook for a year. And during your tribulation, premature death reached the territories of Jula and Shamb”.

Արդ, պատմեմ յայսմ վայրի զարդէտ տարակուսանաց և կսկծի: Զի վասն բազմութեան մեզաց մերոց եղև շարժի վերայերկրի, զի հաստատութիւնք երկրի դըղեցան, և կարծր բնութիւնք վիմաց պատահեցան, և բազում դիակունք մեռեալ գտան, և ամբի ի վասն երկիրս շարժեալ: Եւ մինչ այս տագնապի կայար եկն մահ տարածան ի վերայ երկիրս ի Ծուղայ և ի Շամբն...

This colophon was also written at Tat'ev (in the monastery of Mecop'), in the year 856 (10 December 1406 – 9 December 1407). As for the references to Jula and Shamb, the text speaks of “death” (մահ) and not of earthquake, and refers in reality, as the subsequent colophon text makes clear, to the death of some monks, an event unrelated to the earthquake.

▲ 1406 before 11 29

localities	lat.	long.	I
Tat'ev	39 23	46 14	VI

< 260 > 1407 April 9 – May 8 [Dhu'l-Qa'da 809 H.] Antioch [southern Turkey]

sources al-Suyuti, *Kashf*, p.56
 literature Taher (1979); Ambraseys and Melville (1995)
 catalogues p. al-Hakeem (1987)

Between 9 April and 8 May 1407 (a period corresponding to the month of *Dhu'l-Qa'da* in the year 809 of the Hegira), there was a destructive earthquake at Antioch which killed a great many people. Information about this earthquake is to be found in the work of the Arab historian al-Suyuti (second half of the 15th century):

“In the month of *Dhu'l-Qa'da* [9 April – 8 May 1407] the earth shook at Antioch. Many people died in the ruins”.

في ذي القعدة زلزلت أنطاكية زلزلة عظيمة ومات تحت الردم خلق كثير.

Ambraseys and Melville (1995, pp.339-40) link to this event an earthquake which apparently struck the island of Cyprus on 29 April 1407. The evidence for this Cyprus earthquake comes from a partly defective *Notula* published in Darrouzès (1951, p.43, no.13), who in any case dates the earthquake to 29 April 1397 (see the entry concerned).

▲ 1407 04 09 – 05 08 [Dhu'l-Qa'da 809 H.]

localities	lat.	long.	I
Antioch	36 14	36 07	VIII-IX

< 261 > 1407 June 25 Iadera [Croatia]

source Paolo de Paolo, *Mem.*, p.438
 literature Albini (2004)
 catalogues d. Kispatic (1891-92)

This earthquake is listed in Kispatic's catalogue (1891-92), but not in the parametric catalogue of Shebalin *et al.* (1974). Study of the event is still at a preliminary stage: Albini's (2004) review records the only known source at the present stage of research. In fact, all our information about this and another three earthquakes felt at Iadera

(present-day Zadar) in the late 14th and early 15th century (see the entries < 229 >, < 233 >, < 250 >, < 251 > in this catalogue) come from the sole contemporary author to record them, namely Paolo de Paolo. He lived at Zadar and wrote a chronicle recording events at the city between 1371 and 1408. However, no manuscript copies or critical editions of Paolo de Paolo's work survive; all we have is a 1668 edition published by Giovanni Lucio, and we do not know whether it is complete and/or revised. In Thomas Trattner's republished edition of 1758, Paolo de Paolo's text is shorter than in Lucio's 1668 edition, so it is difficult to assess this "lost" source.

On 25 June 1407 at about 4:00 UT (*in aurora*), an earthquake described as "terrible" (*terribilis*) occurred at Zadar. Since Paolo de Paolo provides no further information about effects, any attribution of intensity is based solely on the word "terrible".

The text of Paolo de Paolo as published by Lucio (1668, p.438) is the following:

"1407. On Tuesday 21 June the church of St.Chrysogonus at Zadar was consecrated and on Saturday 25 June at daybreak there was a really terrible earthquake".

1407. Die martis Iunii 21. consecrata fuit Ecclesia Sancti Grisogoni de Jadra die Sabbati 25. Iunii in aurora fuit valdè terribilis terraemotus.

As for the earthquake's intensity, Albini (2004, p.686), thinks that the fact that the indication of date and time does not follow the description of effects, and that the writer goes on to describe life in the town without recording any substantial change, suggests that there were no substantial effects. However, Albini does not provide a local intensity estimate. Since the source does not tell us whether the earthquake was felt elsewhere, it is not possible to attribute an epicentral intensity to the event, but only to the site.

▲ 1407 06 25 4:00 UT

localities	lat.	long.	I
Zadar	44 07	15 15	VI?

< 262 > 1408 January 3 Bologna [northern Italy]

sources 1 Pietro di Matt., *Cron.*, p.199; Giovanni, *Cron.*, p.7; Delayto, *Ann.*, col.1045

sources 2 BUBo, *Mss.* 2012, b.VI, n.2, *Framm.*, fol.63r; Ghirardacci, *Hist.*, II, p.578

historiography BCariosteaFe, cl.I, 105, Olivi, *Ann.*; Muzzi (1840-46); Davia (1909)

literature Camassi and Molin (1994); Guidoboni (1997); Guidoboni and Ciuccarelli (2003a)

catalogues d. Bonito (1691); Perrey (1848); Mallet (1853); Mercalli (1883); Baratta (1901); *Boschi *et al.* (1997, 2000)

catalogues p. Giorgetti and Iaccarino (1971); Carrozzo *et al.* (1973); Postpischl (1985)

This earthquake was given an epicentral intensity of grade VIII MCS in Postpischl's parametric catalogue (1985). The information presented here is based on Boschi *et al.* (1997, 2000) and Guidoboni and Ciuccarelli (2003a) and permits a substantial readjustment of Postpischl's (1985) intensity estimate.

On 3 January 1408, towards 16:30 UT (the 24th hour, "Italian time") an earthquake struck the city of Bologna. Buildings were shaken and the great bells rang at the old town hall (now the *palazzo del Podestà*) and those of the cathedral of S.Pietro rang out three times as well; everyone was struck with fear. At Ferrara, the shock was weak and brief. This earthquake is recorded in three primary sources of the time, two from Bologna and one from Ferrara: the chronicle compiled by Pietro di Mattiolo, parish priest of the church of S.Michele del Mercato di Mezzo at Bologna (the church no longer exists); the *Cronaca Bolognese* by a priest named Giovanni, who may have been the parish priest of the church of S.Maria delle Grazie of Porta Ravennana, and the

reliable *Annales Estenses* by Giacomo Delayto, a contemporary author who was a notary and chancellor to marquis Niccolò III d'Este, lord of Ferrara.

Pietro di Mattiolo writes:

"In 1408, on Tuesday, 3 January, at about the 24th hour, there were very great earthquakes in the city of Bologna, causing great amazement and fear in those who felt them. These earthquakes and the great shaking caused the great bell of the *arengo* of the commune of Bologna and the great bell of the tower of S. Pietro Maggiore to sound three times each without being touched or rung by anybody".

MCCCCVIII. uno martidì che fo adì III del mexe de genaro, circa le XXIII hore venne gli terremoti grandissimi in la citade de bologna, con grandissima amiratione e paura d'ogne persona, che questi terremoti senti, per gli quali terremoti e commovimenti, la campana grossa da l'arengo del comuno de bollogna, e la campana grossa de la torre de sam piedro maore deno tre botte zascuna senza esser tocade nè sonade da alchuna persona.

The priest Giovanni records: "1408, on the third day of the month of January. Earthquakes occurred in the year and on the day recorded above. It was a Tuesday, and it happened in Bologna, and many people felt these earthquakes".

Millesimo CCCC VIII die III mensis Jenuarii.

Venen i teremotti al millesimo e di ch è scripto de sopra, e fo in martidì e fo in bologna questo e molte persone iesenti quisti teremotti etcetera

3 January was indeed a Tuesday in 1408. The earthquake was probably felt at Ferrara. The *Annales Estenses* by Giacomo Delayto report a slight shock at Ferrara for the same day, 3 January 1408, but the time indicated is different from that in Pietro di Mattiolo's chronicle: dawn instead of dusk. It is our opinion, however, that this was the same earthquake as at Bologna, rather than a distinct and separate shock. Giacomo Delayto writes:

"In the year of Our Lord 1408, on the third day of January, at dawn, there was an earthquake, but it was brief and the shaking was moderate".

Anno Domini MCCCCVIII die III Januarii, in aurora fuit terraemotus, sed brevis, et modicae excussionis.

Amongst the substantial number of 15th century Bolognese chronicles, we find no mention of the earthquake either in the *Bolognetti*, *Rampona* and *Varignana* chronicles, or in the *Memoriale historicum* by the notary Matteo Griffoni. But it is mentioned in the *Historia di Bologna* by the Augustinian monk Cherubino Ghirardacci, a reliable 16th century Bolognese scholar and historian, whose source of information is the chronicle of Pietro di Mattiolo (ca.1350-1425). There is no mention of the earthquake in the chronicles of other cities in the Po Plain, such as Mantua and Venice.

▲ 1408 01 03 16:30 UT

localities	lat.	long.	I	localities	lat.	long.	I
Bologna	44 30	11 20	V	Ferrara	44 50	11 37	III

< 263 > **1408 December 29 Western Syria and Cyprus island**
 ▷ tsunami, fissures, landslides, avalanches ◁

sources Ibn Hajar, *Inba*, II, pp.400-401; al-Maqrizi, *al-Suluk*, III/3, p.1122

literature Taher (1979); Poirier *et al.* (1980); Ambraseys and Melville (1995); Ambraseys and Jackson (1998)

catalogues d. Evangelatou-Notara (1993)

catalogues p. Poirier and Taher (1980); al-Hakoom (1988)

On 29 December 1408, a destructive earthquake occurred in western Syria and the island of Cyprus. Major destruction occurred at Shughr Bakas, including the citadel, where only about fifty inhabitants survived. There was damage at Laodicea (now Al-Ladhiqiya) and Balatunus (present-day Qalat al-Mahalibah), where the citadel collapsed and 15 people died; 15 people were also killed at Jablah. A great deal of damage is also reported as having occurred in Cyprus.

The earthquake had striking effects on the earth's surface: between Qusayr and Saltuhum the earth split open over a mile. The earthquake probably set a landslide in motion near Saltuhum and surface strata slipped for about a mile. Although the account of this latter phenomenon looks like a literary topos (a village moving from one place to another while its inhabitants sleep) a real landslide probably did take place. The place called "Saltuhum" or "Saltuham" (and there are other variants) has not been identified. Ambraseys and Melville (1995, pp.340-1) suggest that it may have been about 20 km south of Qusayr, probably near Jisr al-Shughr on the Orontes, that is to say in the area where the earthquake effects were strongest. Ambraseys and Melville interpret what we are told about the distance between Qusayr and Saltuhum, where the earth split open, as being a *barid* (or *baryd*), a unit of distance equal, at least in theory, to about 20 km. However Ibn Hajar, who is the most important Arabic source for this earthquake, uses the term "mile" for this distance — the same word, that is to say, which he uses a little later in connection with the Saltuhum landslide, and which Ambraseys and Melville (1995) themselves use in their translation of the passage from Ibn Hajar. We have therefore assumed that the phenomenon described, namely the earth splitting open, stretched for an "Arabic mile" or about 1,8-2 km. An avalanche plunged down Mt. Cassius (*jabal Aqra'*) and into the sea. The earthquake also gave rise to a tsunami, perhaps in the stretch of sea opposite or to the south of Mt. Cassius, but there is no specific information available as to its location. The tsunami threw boats out of the sea on to the shore; but there was no other damage. The most detailed information about this earthquake is to be found in the work of Ibn Hajar, a contemporary Arab historian: "On 10 *Sha'ban* there was a tremendous earthquake in the region of Aleppo and Tripoli; the shock caused destruction at Laodicea and Balatunus; the citadel of the latter town collapsed, and 15 people were killed in the ruins. 15 people were also killed at Jabala. The whole of Shughr Bakas was destroyed, including the citadel, and only about 50 of its inhabitants survived. The earth split open for a distance of about a mile, from Qusayr to Saltuhum — the latter is a mountain village — and it moved about a mile, including trees, streams and inhabitants, without anyone realising what was happening. The earthquake also struck Cyprus, causing a great deal of damage there. It also struck the coastal and mountain areas; snow on the summit of Mt. Cassius (*jabal Aqra'*) was seen to come down to the sea. A high tide stretched over 10 parasangs [64 km]. Sailors said that boats at sea were pushed on to the land by the tide; when the sea fell back, nothing proved to have been damaged".

في عاشر شعبان جاءت زلزلة عظيمة في نواحي بلاد حلب وطرابلس فخرّب من اللاذقية وبلاطنس أماكن عديدة وسقطت قلعة بلاطنس فماتت تحت الردم خمس عشر نفسا ومات بجبله خمس عشر نفسا وخرّب ثغر بكاس كلها وقلعتها ومات جميع أهلها إلا نحو خمسين نفسا وانشقت الأرض وانقلبت ميل من بلد القصير إلى ملتوهم وهي بلد فوق جبل فانتقلت قدر ميل بأشجارها وأعينها وأهلها ولم يشعروا بذلك وكانت الزلزلة بتبرس فخرّب فيها أماكن كثيرة وكانت بالجبال والساحل وشوهد ثلج على رأس الجبال الأقرع وقد نزل إلى البحر وطلع بينه وبين البحر عشر فراسخ وذكر أهل البحر أن المراكب في البحر المالح وصلت على الأرض لما انحسر البحر ثم عاد الماء كما كان فلم يتضرر أحد.

The information about Laodicea, Jablah, Balatunus e Shughr Bakas given in al-Maqrizi's record of the 1404 earthquake probably refers to the event of 1408: "The earthquake also affected Laodicea, Jabala, the citadel of Balatunus, Shughr Bakas, and a great many villages in the mountains and along the coast; many people died in the ruins".



1408
December 29

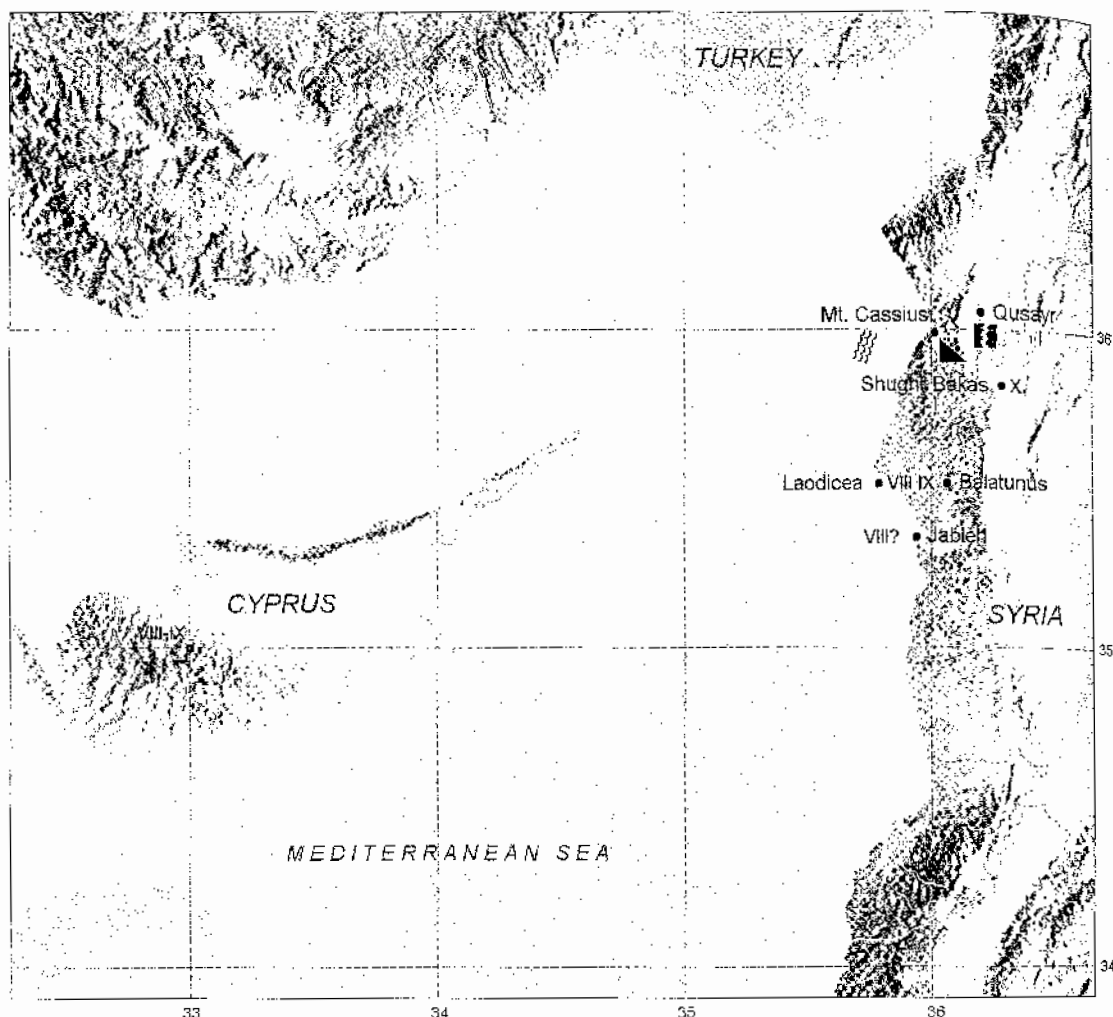


fig. 102

[...] وعمت اللاذقية وجبله وقلعة بلاطنس وشر بكاس وعدة بلاد بالجبل والساحل فهلك تحت الردم جماعة.

Poirier *et al.* (1980) and Poirier and Taher (1980) date this earthquake to 30 December 1408 (instead of 29 December) and apply the term "heavy destruction" only to the Antioch (Antakia) area (but there is in fact no evidence for such effects there) and to Aleppo. The fact is that the principal source for this event (Ibn Hajar) simply indicates that the Aleppo region was struck, without referring explicitly to the city itself. These same authors locate the tsunami at Al-Ladhiqiya, but here too we have to note that Ibn Hajar does not indicate a specific location for the event.

Ambraseys and Melville (1995, pp.340-2) pay particular attention to discussing the possible location of the place called Saltuhum (or Saltuham etc.) and suggest that the "surface faulting" may have stretched for at least 20 km from Qusayr, either south-west towards the coast, or southwards along one or more strands of the Dead Sea fault.

▲ 1408 12 29 ★ = 35 40 36 10 I₀ = IX Me = 6.0 Sites: 5 EE: 3 Ts

localities	lat.	long.	I	localities	lat.	long.	I
Shughr Bakas SYR	35 50	36 17	X	Jablah SYR	35 21	35 55	VIII?
Qalat al-Mahalibah SYR	35 31	36 04	IX	Mt. Cassius TR	36 00	35 59	EE
■ Cyprus (island) CY	35 00	33 00	VIII-IX	Qusayr TR	36 03	36 12	EE
Al-Ladhiqiya SYR	35 31	35 47	VIII	Saltuhum	—	—	EE

(264) 1409 August 14 Ferrara [northern Italy]

(265) 1409 August 17 Ferrara

sources 1 BC Ariostea Fe, cl.I, 534, Da Marano, *Cronica*; ASMo, Ms., 44, *Frammenti*, fol.2
source 2 *Diario Ferrarese*, p.4
literature Guidoboni (1986)

This earthquake is unknown to the seismic catalogue tradition, but is recorded in Guidoboni (1986, p.282).

During the night of 16-17 August 1409 (at about 00:35 or 02:35 UT, that is to say during the sixth or the eighth hour in "Italian time" — the sources are not in complete agreement on this point), an earthquake was felt at Ferrara and caused a number of chimneys to collapse. It was probably an earthquake of local origin, for the sources maintain that it was not felt in other parts of the Ferrara area. It was preceded by a weak shock, felt at Ferrara on 14 August at about 08:45 UT (the fourteenth hour in "Italian time").

The sources are three 15th century Ferrarese chronicles, two of which are unpublished: the Italian vernacular chronicle by Giacomo da Marano (1344-1412), which was written in the early 15th century and is now in the Biblioteca Comunale Ariostea in Ferrara (*Manoscritti*, cl.I, 534); a fragmentary and anonymous Latin chronicle dating to 1409, now in the Archivio di Stato in Modena (*Manoscritti*, 44); and the *Diario ferrarese*, a work which may have been compiled by a Ferrarese notary who lived between 1430 and 1502, and which summarises information on the earthquake probably obtained from Giacomo Da Marano's chronicle. Giacomo Da Marano's chronicle records:

"How there was a very great earthquake at Ferrara.

In that year [1409], during the night of Friday to Saturday 17 August at the sixth hour of the night, there was a very great and dreadful earthquake in Ferrara. It was enormous in the opinion of many elderly men who could not remember having felt a greater shock than this, and many chimneys collapsed in the city. But although this was a terrible and very great earthquake, it was not felt outside the city gates or anywhere else".

Come el trete uno grandissimo taramoto in Ferrara.

De ditto anno viegnare de notte vegnando al Sabatho chera à di 17 de Agosto nele 6 hore de notte trette uno grandissimo et spaventoso taramoto in Ferrara el qualle fu molti smisurato che per la opinione de molti hominj antichi non se aricordavano maj più havere sentito el maggiore taramoto de questo, et cadé in la Città de molti caminj per la terra. Et questo taramoto quantunqua si stato terribile et fuora de modo grandissimo però el non fu sentito fuora de le porte de la Cittade né anche in alcuno altro locho.

Although the fragmentary chronicle of 1409 is terser than the above, it does mention that the stronger shock was preceded by a weaker one on 14 August:

"Earthquake In that same year 1409, on Wednesday 14 August, there was a single weak earthquake at about the fourteenth hour.

Earthquake During the night of 15 August, shortly after the eighth hour, there was another earthquake, but [this time] it was strong.

Terremotus Eodem anno MCCCCVIIIJ die mercurij XIIIJ Augusti circa horam XIIIJ fuit terremotus unus mediocris.

Terremotus Nocte que secuta fuit post diem XV Augusti paulo post horam octavam fuit alius terremotus set magnus.

▲
1409 08 14 8:45 UT

localities	lat.	long.	I
Ferrara	44 50	11 37	IV

1409 08 17 0:35-2:35 UT

localities	lat.	long.	I
Ferrara	44 50	11 37	VI

< 266 > **1409 November 15 Parma [northern Italy]**

sources BPalatina, Parma, *Mss. Parm.*, 459, *Cont.*, in Edoari de Erba, *Miscell.*, fol.245; *Mss. Parm.*, 978/2, *Estratto*, fol.48v.

historiography BPalatina, Parma, *Mss. Parm.*, 126 [Vaghi], *Cron.*, fols.138v-139r.; *Mss. Parm.*, 460/8), *Cron.*, p.446; ASPr, *Mss.* 78, Gozzi, *Mem.*; Pezzana, *Storia*, II, p.134

catalogues d. Benassi (1899); Baratta (1901); Milne (1911); *Boschi *et al.* (1995, 1997, 2000)

catalogues p. Giorgetti and Iaccarino (1971); Carrozzo *et al.* (1973); Postpischl (1985); CPTI (1999)

On 15 November 1409 at 11:15 and 12:15 UT (the 19th and 20th hours, "Italian time"), Parma was struck by two earthquake shocks. They knocked down many chimneys, many of the battlements on the town hall, and an otherwise unidentified wall of the church of S.Agnese.

This event is not recorded in contemporary chronicles from Emilia, nor in the administrative, institutional and church documents of the time. But it is recorded in various later manuscript chronicles from Parma, from the 16th century onwards. The fact that the earthquake is recorded in very similar terms in all these chronicles, makes it reasonable to suggest that they all rely on a common source which is now unknown. In the anonymous additions to Giovanni Cornazzano's chronicle, which continue it up to 1527 and are preserved in the *Miscellanea storica di cose Parmigiane* by Angelo Mario Edoari de Erba (Biblioteca Palatina, Parma, *Manoscritti Parmensi*, 459, fol.245), we read:

"1409. On 15 November at the 19th and 20th hours there was a great earthquake which knocked down many battlements on the *Palazzo di Piazza* [the town hall] and many on the wall of S.Agnese as well as many chimneys".

1409. 15 Novembre a ore 19 e 20 fu grande terremoto, che atterrò del Palazzo di Piazza molti merli e molti del muro di S.Agnese con molti camini.

The same information is to be found in another 16th century manuscript preserved in the Biblioteca Palatina at Parma (*Manoscritti Parmensi*, 978/2, fol.48v.).

Research carried out at the Archivi di Stato of Parma and Reggio Emilia produced no relevant information. In the latter Archives we consulted the following collections: *Carteggi* (*Carteggio degli Anziani*); *Reggimento* (*Carteggio del reggimento o governativo o della luogotenenza*); *Consigli* (*Provvisgioni o riformagioni del consiglio generale*).

▲ 1409 11 15 11:15 UT

localities	lat.	long.	I
Parma	44 48	10 20	VII

< 267 > **1411 January 9 Ferrara [northern Italy]**

source 1 BCariosteaFe, cl.I, 534, Da Marano, *Cronica*

source 2 BAVat, Chigiani, I.I.6, *Cronica di Ferrara*, fol.9r.

This earthquake is unknown to the seismic catalogue tradition.

On 9 January 1411 between about 01:30 and 02:30 UT (between the 9th and 10th hour

in "Italian time") a strong earthquake (probably a sequence of shocks) struck the city of Ferrara, causing the collapse of a very large number of chimneys and inflicting a great deal of other damage both in the city and the surrounding countryside. It was felt more than 30 km [15 miles] from Ferrara, and across this area there was serious damage to houses, though the localities concerned are not identified.

The sources are two unpublished 15th and 16th century Ferrarese chronicles: the chronicle in the Italian vernacular written by Giacomo da Marano (1344-1412) in the early 15th century and now in the Biblioteca Comunale Ariostea in Ferrara (*Manoscritti*, 534), and an anonymous 16th century manuscript chronicle now in the Biblioteca Apostolica Vaticana, in the Chigi manuscript collection (I.I.6). Giacomo da Marano's chronicle records:

"How there was a very great earthquake at Ferrara.

In that year [1411], on Friday 9 January between the 9th and 10th hour there was a very great earthquake in Ferrara, lasting for little less than an hour. It was quite terrible and frightening and caused a huge number of chimneys to collapse. It also caused a vast amount of damage in the city, and was felt for about 15 miles around Ferrara as well. It destroyed great numbers of houses there as well as many reed [?] barns, and it was the precursor of famine".

Come el trette uno grandissimo taramoto in Ferrara.

De ditto anno viegnare adi 9 de Zenaro fra le 9 et le 10 trette uno grandissimo taramoto in Ferrara el qual durò pocho mancho de una hora el qual fu molto terribile et spaventoso et fece ruinare infinito numero de caminj. Et anche fece asai altri infinitj malj in la Cittade, et anche fuora de la Cittade et questo taramoto fu sentito cercha 15. miglia atorno atorno a Ferrara. Dove che fece ruinare infinite case et molte tieze de Cana et fu ambasatore de la Carastia.

▲ 1411 01 09 01:30-02:30 UT

localities	lat.	long.	I
Ferrara	44 50	11 37	VII

(268) **1414 Gargano peninsula [southern Italy]**

source Joanna II of Anjou (queen), Exemption, document quoted in Giuliani (1768)

historiography Giuliani (1768); Ranieri (1949)

catalogues d. Baratta (1896, 1901); Milne (1911); *Boschi *et al.* (1995, 1997, 2000)

catalogues p. Giorgetti and Iaccarino (1971); Carrozzo *et al.* (1973); Postpischl (1985); CPTI (1999)

In 1414, Vieste (now in the province of Foggia, on the Adriatic coast of the Gargano peninsula) was seriously damaged in an earthquake. The town lay within the territory of the Capitanata province, which belonged to the kingdom of Naples.

There is a record of the earthquake in the work of a local historian called Giuliani (1768). He mentions documents from the Chancery of the kingdom of Naples, according to which queen Joanna II of Anjou (1414-1435) granted several years' tax exemption to the town of Vieste, as well as many other privileges. According to Giuliani, these documents were lost in a fire, and hence they cannot now be traced. The granting of extended tax exemptions to the town suggests that there had been widespread destruction.

▲ 1414 --

localities	lat.	long.	I
Vieste	41 53	16 11	VIII-IX?

< 269 > 1414 August 3 Northern Tuscany [Italy]

- sources [manuscripts] BNC Florence, *Magliabechiano*, VIII, 1488, *Ricordi*, fol.95r.; *Notula*, in Pilla (1846, p.200); Pietro di Matt., *Cron.*, p.260
- historiography Ghirardacci (1596-1657); BUBo, 770, Ghiselli, *Mem.*; AMontese, Giacobazzi, *Storia*; Banorri (2000)
- literature Castelli *et al.* (1989); Castelli and Monachesi (1996)
- catalogues d. Pilla (1846); Perrey (1848); Mallet (1853); Mercalli (1883); Baratta (1901)
- catalogues p. Giorgetti and Iaccarino (1971); Carrozzo *et al.* (1973); Postpischl (1985); Monachesi and Stucchi (1997)

Postpischl's (1985) parametric catalogue lists an earthquake at 3 August 1414 on the basis of Baratta's (1901) catalogue. It is given an epicentral intensity of grade VII MCS and located at Cascina (province of Pisa). It is not included in the CFTI catalogue (Boschi *et al.* 1995, 1997, 2000) because its intensity is below the VII-VIII MCS threshold. Nor does it appear in CPTI (1999). The reason for this exclusion is set out in Castelli *et al.* (1989, pp.162-3), and especially in Castelli and Monachesi (1996, pp.1031-5). While expressing certain misgivings, these authors think that the 3 August 1414 shocks are in fact to be related to the 7 August 1414 earthquake in the province of Siena (see the next entry for that event). This interpretation has also been accepted by the DOM database (Monachesi and Stucchi 1997) on which the CPTI (1999) catalogue is based.

It is our opinion, however, that the 3 August shocks are distinct from those of 7 August. The sources which record the 3 August shocks are in fact entirely acceptable as far as chronology is concerned: the *Notula* made at the convent of S.Caterina in Pisa and Pietro di Mattiolo's chronicle — two contemporary, local and mutually independent sources — specifically state that the earthquake occurred on Friday, 3 August, and 3 August was indeed a Friday in 1414. The literature is already aware of these sources, and we have been able to add an additional manuscript source concerning Florence (BNC, Florence, *Magliabechiano*, VIII, 1488, fol.95r.). It contains information about the shocks of 3 August and those of 7 August as well (see the next entry). We therefore concluded that the earthquakes of 3 and 7 August 1414 were separate events with different areas of origin.

On the evening of 3 August 1414, an earthquake described as "very great" (*maximus*) struck northern Tuscany. The scarcity of information as to the localities affected makes it impossible to establish the exact epicentral area. At Pisa, and probably at Lucca and other unspecified places in Tuscany, the inhabitants fled in terror from their homes, fearing that they would collapse. Two shocks were felt in Florence, but their effects are not specified: one was at 17:35 and the other at 18:15 UT (22:40 and 23:20 in "Italian time"). Earlier on that same day, 3 August, another shock had been felt, apparently an hour and a quarter before sunrise (i.e. at about 03:00 UT). The evening shocks were also felt at Bologna.

According to an early 19th century local historian (Pellegrino Giacobazzi), a tower partially "collapsed", causing severe damage to the buildings below, at the old walled hamlet of Dismano, which now no longer exists but was then near Maserno in the Modenese Apennines. In our present state of knowledge, there are three contemporary local sources (one manuscript) which record the event. A *Notula* made by the Dominican friars of the convent of S.Caterina in Pisa, published in Pilla (1846, p.200), is known to the seismic catalogue tradition and is referred to in Baratta (1901, p.62). This *Notula* uses the Pisan Incarnation style, which is one year ahead of present-day reckoning for the period between 25 March and 31 December:

"Note that in the year of Our Lord 1415 in the style of the city of Pisa [1414 in modern terms], in the cities of Pisa, Lucca and Florence, and in their *contadi* [rural area subject to the urban authorities], as well as in many other parts of Tuscany, there was

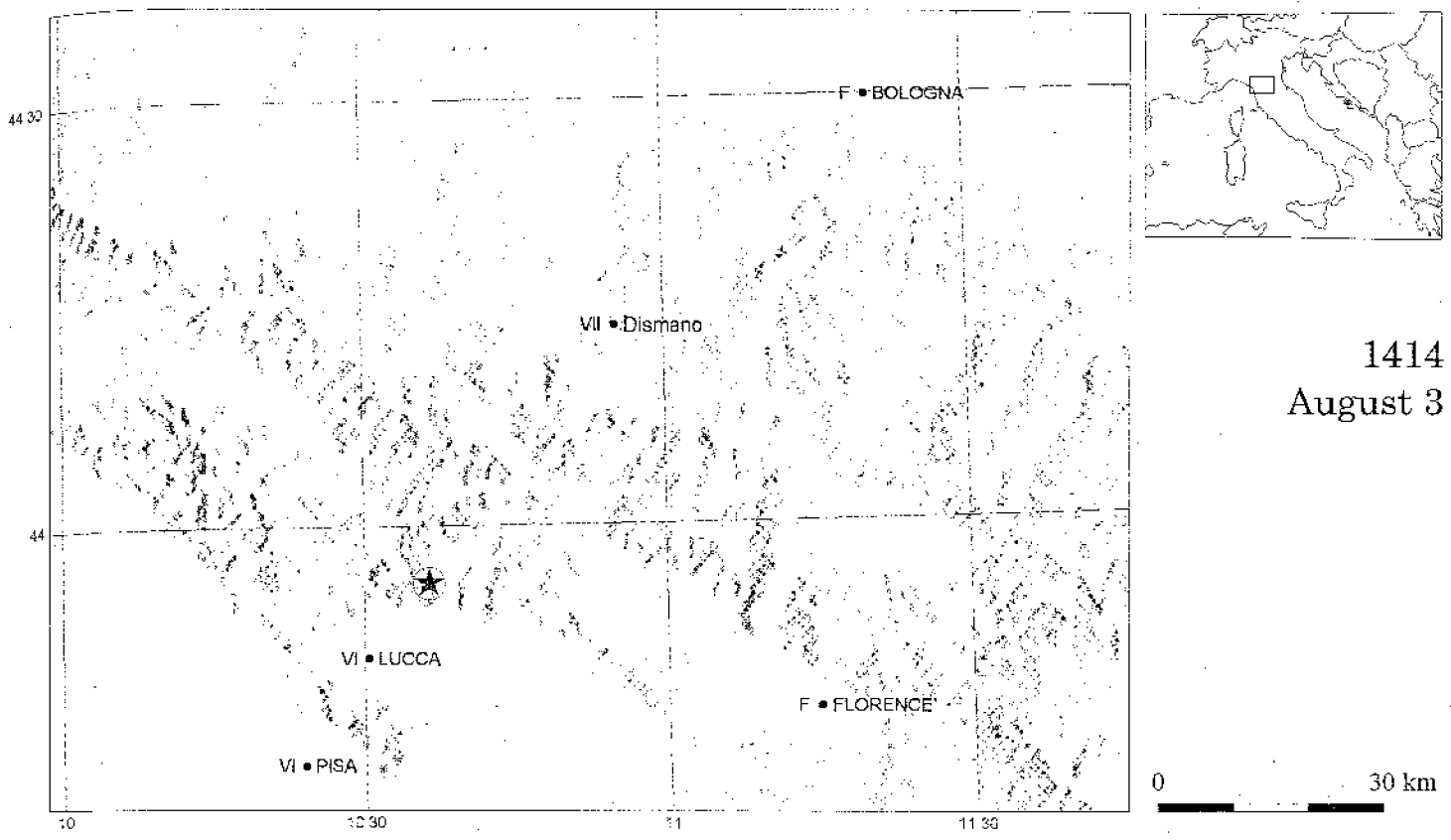


fig. 103

a very great earthquake on Friday 3 August, in the evening, at the twenty-second hour, and men and women fled from their houses and shops in terror, not knowing where to go and fearing that their houses and other buildings would collapse in ruins; and those who saw these things at Pisa also heard from travellers about other places where this sign had had extraordinary effects; and I have written these things down in this book to bear witness to the truth, so that we may all be ready, for Our Lord Jesus Christ intends to come and call us to account. Thanks be to God".

Nota quod Anno Domini MCCCCXV secundum usum Civitatis Pisane, in Civitate Pisana, et Lucana et Florentie et in eorum Comitatus, et multis alijs locis Tuscie fuit factus Terremotus maximus die veneris in sero vigesima secunda hora die tertio augusti, et homines et persone stupefacti fugiebant de extra domos et de apotecis earum, et nesciebant quo ire credendo quod omnia edificia et domos deberent cadere et ruinare; et qui hec vidit Pisis, et audivit a viatoribus de alijs locis qui dicebant mirabilia magna de hoc signo, in testimonium veritatis in isto libro hec scripsit, ut omnes stent parati quia Dominus Noster Jhesus Christus vult venire ad excitandum nos. — Deo gratias.

The other contemporary local source is the chronicle of Pietro di Mattiolo, priest at the church of S.Michele del Mercato di Mezzo in Bologna (it no longer exists). This chronicle is cited in Castelli *et al.* (1989), and was already known, indirectly, to Baratta (1901) through the work of Ghirardacci (ed. 1596-1657), one of the most authoritative early modern texts in Bolognese historiography. Pietro di Mattiolo writes: "1414. On the third day of the month of August, which was a Friday, between the twenty-second and twenty-third hours, there were earthquakes at the city of Bologna".

MCCCCXIII Adì terzo del mexe d'agosto, e fo uno viegnirì tra le XXII e le XXIII hore fono gli terremoti in la Citade de bollogna.

1414
August 3

0 30 km

The unpublished source is unknown both to the catalogue tradition and seismological literature, and consists of a brief report in a 15th century manuscript copy of the *Ricordi di gran freddi e gran caldi dovizie e carestie* (Biblioteca Nazionale Centrale, Florence, Magliabechiano, VIII, 1488). It is the most specific source as regards the time of the shocks:

"In the year 1414 on 3 August [in Florence] there was an earthquake 1 1/4 hours before sunrise and then there were two more that same evening at 22 2/3 and 23 1/3".

Anno 1414 adi 3 d'agosto fu uno tremuoto inanzi il levare del sole hora 1 1/4 e poi ne furono 2 la sera medesima a ore 22 2/3 e a ore 23 1/3.

In our opinion — as in the case of the earthquake of 20 July 1399 (see the entry concerned) — the information about damage at the old hamlet of Dismano must be taken into consideration, though with due caution. It is provided by the local historian Pellegrino Giacobazzi (18th-19th c.), whose manuscript history of Montese (a village in the province of Modena) may have made use of chronicles which are now lost. This manuscript was used by Banorri (2000), a local historian of Montese.

▲ 1414 08 03 17:35 UT		★ = 43 56 10 36		Io = VI	Me = 5.2	Sites: 5	
localities	lat.	long.	I	localities	lat.	long.	I
Dismano	44 14	10 55	VII	Bologna	44 30	11 20	F
Lucca	43 51	10 30	VI	Florence	43 47	11 15	F
Pisa	43 43	10 24	VI				

< 270 > **1414 August 7 Colline Metallifere [Tuscany, Italy] > fissures <**

- sources 1 [manuscripts] BRiccMor, Florence, *Mss. Riccard.*, 1030, *Ricordi*, fol.12r.; *Mss. Pecci*, 4, *Raccolta*, fol.77r.; BNCFlorence, *Magliabechiano*, VIII, 1488, *Ricordi*, fol.95r.; ASFlorence, *Carte Stroziane*, II, 105, *Priorista*, fol.122v.; Bartol. Corazza, *Diario*, p.254; Buoninsegni, *Stor.*, p.7; [Montauri], *Cron. senese*, II, pp.780-1
- sources 2 ASFlorence, *Mss.*, 120, *Copie di note*, no.6, fol.175v.; *Mss.*, 238, Spinelli, *Priorista*; BNCFlorence, *Banco Rari*, 22-23, de' Ricci, *Priorista*; BAVat, Chigiani, G.I.31-35, G.II.36-40, Tizio, *Hist.*, IV, fols.82v.-83r.; Pierozzi, *Chron.*, p.96; Ammirato, *Dell'ist.*, I, p.668
- historiography Malavolti (1599); Farulli (1713, 1717); Soldani (1798)
- literature Castelli *et al.* (1989); Castelli and Moriani (1990); Castelli (1991); Castelli and Monachesi (1996)
- catalogues d. Bonito (1691); Sarti (1783); Pilla (1846); Perry (1848); Mallet (1853); Mercalli (1883); Giovannozzi (1895); Baratta (1901); Guidi (1915); SGA [1991]; *Boschi *et al.* (1995, 1997, 2000)
- catalogues p. Giorgetti and Iaccarino (1971); Carrozzo *et al.* (1973); Postpischl (1985); CPTI (1999)

In Postpischl's (1985) parametric catalogue, the 7 August 1414 earthquakes are given an epicentral intensity of grades IX and VIII MCS, and are located at Sansepolero and Monterchi. These parameters derive from data in Baratta (1901, p.62), who in his turn was using Farulli (1713), a learned local historian. According to Farulli, Sansepolero was almost completely destroyed by an earthquake in 1414 and there were 200 victims. The study by Castelli *et al.* (1989) has shown that the information provided by Farulli is without foundation, for there is no mention of such a destructive earthquake in local authority documents or chronicles. Castelli *et al.* (1989) therefore suggested relocating the 7 August 1414 earthquakes to western Tuscany on the basis of information from some 15th century Siennese and Florentine chroniclers. As far as effects at Florence and Siena are concerned, it has been possible to add new data thanks to research carried out on the specific subject of seismic hazard at Florence in the period 12th - 20th century (SGA, Report 1991). The unpublished sources used in this

research (Archivio di Stato, Biblioteca Nazionale Centrale, Biblioteca Riccardiana and Moreniana in Florence) have made it possible to establish more accurately the extent of the damage at Florence and Siena. The results of this new research have been accepted and used by CFTI (Boschi *et al.* 1995, 1997, 2000). This present entry is thus a critical review of that research.

On 7 August 1414, a sequence of numerous shocks struck Tuscany, and especially the Siena and Florence areas. There were two strong shocks that afternoon, of which the most violent occurred shortly before 15:00 UT (the 20th hour, "Italian time", or the ninth hour in canonical time; but other slightly different times are given in the sources). The most severely affected place was Montingegnoli, where the town hall was badly damaged, but nobody was killed. A crack about 7-8 cm wide appeared in the rocky hill on which the castle stood. Many chimneys collapsed at Siena. In Florence, more than two hundred chimneys collapsed either completely or in part, as well as some walls and a few roofs.

The only reported victim was a woman struck by a collapsing chimney in Florence. Solemn processions were organised for 10, 11 and 12 August in Florence, in order to pray for the cessation of the shocks.

The earthquake is recorded in numerous contemporary chronicle sources, some of which have been published, while others are manuscript. For Florence, we give the text of four reliable sources. The most detailed information is to be found in the *Diario Fiorentino* of Bartolommeo del Corazza (ed. Corazzini, 1894), who held management posts in the Guild of Vintners. It was published by Muratori (1731) as an anonymous work under the title *Historia Florentina*:

"A record that on 7 August [1414], [and] previously, there were earthquakes in Florence, amongst which two on the said 7, between the ninth hour and vespers, were so strong that the whole populace of Florence took fright: on that day more than two hundred chimneys collapsed in Florence, either entirely or in part, and some walls and roofs, so that there was a great deal of damage".

Memoria che addì 7 d'agosto, e inanzi, venneno terremoti in Firenze; fra' quali ne venne il detto dì 7, fra la nona ora e 'l vespro, due sì grandi che tutto il popolo di Firenze impaurì: il detto dì e' caddono in Firenze più di dugento camini, o tutti o parte, e alcuno muro e tetti, per modo feciono assai danno.

The writer goes on to describe the processions and religious ceremonies which took place between 10 and 12 August. Similar information can also be found in the chronicle of Domenico Buoninsegni, a rich Florentine merchant whose work was written a little more than half way through the 15th century. His chronicle covers the years 1410-1460, but was not published until 1637:

"In that same month of August [1414], there were many great earthquakes in Florence and outside the city, both by day and night; but especially on the 7th they were so strong at the 20th hour that men and women fled from their homes; and then large and devout religious processions were organised and held".

Nel medesimo mese d'agosto furono in Firenze, e di fuori molti, e gran tremoti, e di dì, e di notte: ma massimamente a dì sette furono sì grandi circa hore 20 che gli huomini, e donne si fuggiano delle case: e però s'ordinò e fecionsi grandi, e devote processioni.

The anonymous *Ricordi storici fiorentini di terremoti e d'altri fatti* (Biblioteca Riccardiana e Moreniana, Florence, *Manoscritti Riccardiani*, 1030), which is preserved in a 15th century manuscript copy, adds a few further details:

"1414. There were many earthquakes in Florence, where many chimneys fell down, and beyond the Arno one apparently fell into the *fondaccio* [a slum district or dwelling], killing a woman; and many tents were set up in the Prato alla Giustizia. Subsequently there were several earthquakes at various times, but they did not cause any damage".

1414. *Venne in Firenze molti tremuoti dove caddono molti cammini e Oltrarno ne cadd'uno credo nel fondaccio dove morì una donna e rizzaronsi molte letta al prato alla Giustizia. E di poi più tremuoti in variati tempi non facendo alcun danno.*

A brief report appears in a 15th century manuscript copy of the *Ricordi di gran freddi e gran caldi dovizie e carestie* (Biblioteca Nazionale Centrale, Florence, Magliabechiano, VIII, 1488):

"Also in that year [1414] on 7 August there were two [earthquakes], that is to say a very powerful one at the twenty-first hour and another at the first hour".

Ancora detto anno adì 7 d'agosto ne furo due cioè uno grandissimo a ore 21 e uno altro a ora 1.

Two other 15th century works record effects in the Siena area. The first is a manuscript collection of chronicles by various hands amongst the *Pecci* manuscripts in the Biblioteca Riccardiana e Moreniana in Florence:

"On 7 August 1414, earthquakes began by day and night; an earthquake made the clock strike, and many chimneys fell down in Siena, and the *palazzo di Montingegnoli* collapsed, as well as houses in various places".

Il 7 agosto 1414 cominciarono i tremuoti di giorno e di notte, suonò l'oriuolo per un tremuoto, e caddero in Siena molti camini, e rovinò il Palazzo di Montingegnoli, e case in più luoghi.

The second work is the *Cronaca senese* attributed to Paolo di Tommaso Montauri. It contains more detail, but does not give the day on which the earthquake occurred. The information it provides is inserted between entries dated to 2 and 13 August respectively:

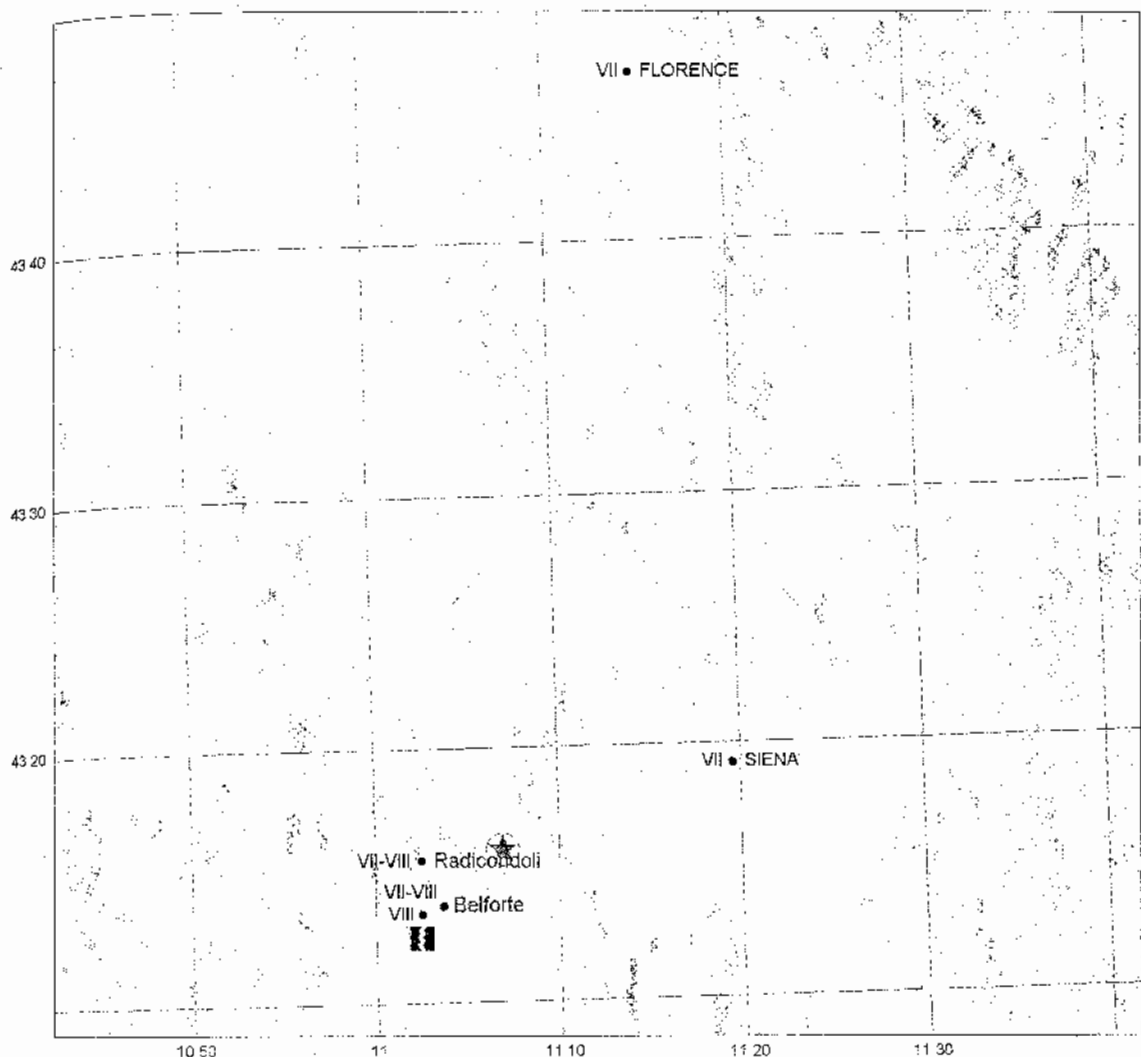
"There were very great earthquakes at Siena: 4 at the second hour and then 4 more at dawn, and then many more during the day, one of which was so powerful that it made the tower clock strike. Many chimneys fell down in Siena, and the *Palazzo di Montingegnoli* collapsed, and the castle hill, which is entirely made of rock, split open in the middle, and the split was more than 4 dita [wide], but no-one was killed. This was in the year 1414. [...]

Messer Giovanni Panciatico, who was *podestà* in Siena, left the *palazzo* in fright at the earthquakes, and went to Santa Marta; and he subsequently returned to the *palazzo* when the earthquakes had come to an end".

Tremuoti furno grandissimi in Siena: a le due ore 4 tremuoti, e poi in sul dì 4, e poi di dì ne fu assai, fra' quali ne fu uno grandissimo che fé sonare l'ore della torre; cadde[ro] in Siena molti ciminaiuoli e ruinò el palazo di Montingegnoli e aperse el pogio del castello per mezo, ch'è tutto sasso, ed era l'apritura più di 4 dita e nò vi morì persona. Questo fu l'anno 1414. [...]

Misser Giovanni Panciatico era podestà di Siena, escì di palazo per paura d'essi tremuoti, e tornò in Santa Marta; e poi tornò nel palazo, restato è tremuoti.

In addition to this earthquake, Baratta's catalogue (1901, p.61), lists another in the Siena area on 8 August 1413, but this is a mistake based on false information. The bibliographical reference Baratta used was Soldani (1798, pp.56-7), who quoted two different sources for his information, namely papers from the *Archivio dello Spedale*, now in the Archivio di Stato in Siena, and the 16th century Siennese chronicler Sigismondo Tizio. At least as far as the latter is concerned, it has been possible to ascertain that Soldani misread the date of the earthquake, for the copy of Tizio's work now in the Biblioteca Apostolica Vaticana (Chigiani, G.I.31-35, G.II.36-40, fols.82v-83r.) clearly dates the passage containing the report of the earthquake to 1414. Indeed, in a later passage in his work (p.84), Soldani correctly dates the shocks felt at Siena to 1414, and not only refers to the previously recorded damage at Montingegnoli, but also adds that



1414
August 7

fig. 104

the nearby villages of Radicondoli and Belforte also suffered damage. It can therefore be confidently affirmed that the event dated to 8 August 1413 is a doublet of the earthquake which actually occurred on 7 August 1414.

▲ 1414 08 07 15:00 UT ★ = 43 16 11 07 I₀ = VII-VIII Me = 5.8 Sites: 5 EE: 1

localities	lat.	long.	I	localities	lat.	long.	I
Montingegnoli	43 14	11 03	VIII EE	Florence	43 47	11 15	VII
Belforte	43 14	11 04	VII-VIII	Sienna	43 19	11 20	VII
Radicondoli	43 16	11 03	VII-VIII				

< 271 > 1417 August 20-25 Negroponte island [Greece] ▷ fissures <

source 1 BN Marciana Ve, *Mss. It.*, VII, 2049 (8332/1-2), Morosini, *Cronaca*, II, fol.83

source 2 Sanudo, *Vitae*, col.917

catalogues d. Wirth (1966); Evangelatou-Notara (1993); *Papazachos and Papazachou (1997)

In August 1417, a strong earthquake struck the island of Negroponte (present-day Euboea): a tower collapsed, and a castle, not identified by the source, suffered severe

damage. The earthquake caused cracks to appear in the ground. Information about this earthquake is to be found in the manuscript *Cronaca*, in old Venetian, by Antonio Morosini, a contemporary writer:

"During the year 1417, in August

News reached Venice in letters to the *signoria* of the doges from our governors at Negroponte, to the effect that an amazing sign had appeared on the island of the king of Negroponte, first in the form of a tremendous earthquake: a tower collapsed there, and a large *castello* was completely razed to the ground, and from time to time the earth opened up in various places and the air became as black as night, so that a man could not see another man's face, but by the grace of God we had no victims".

Corando lano M°CCCCXVII de avosto

Vene nuove a Veniexia, scrite dai retori nostri de Negroponte ala dogal signoria, aver parso al'isola del Reo de Negroponte armirabel segni de nuovo: prima grandissimo taramoto, e la eser cazudo una tore con uno grosso castelo tuto roinado per fina al fondamento a tera cazudo, e a hora a hora avrise la tera in plu' parte e farse schuridade como fose note in l'aiera non se vezando homo con omo per la faza - ma par per la gracia de Dio non avemo de perise alguno!

The information provided in the *Vite dei dogi* by the Venetian scholar and historian Marin Sanudo (1466-1536) is briefer than that in Morosini's chronicle, it may perhaps have come from a common source used by both writers:

"At this time [1417], there was a very great earthquake on the island of Negroponte at the second hour; a tower collapsed and a large *castello* was badly damaged, and the earth split open in various places".

In questo tempo fu un grandissimo tremuoto all'Isola di Negroponte alle due ore, e cadde una torre e un grosso Castello rovinò, e la terra s'apri in più parti.

According to Wirth (1966, p.396), the earthquake occurred between 20 and 25 August.

▲ 1417 08 20-25

localities	lat.	long.	I
■ Euboea island	38 30	24 14	VIII-IX

< 272 > **1418 March 7 Aurana [Croatia]**

sources 1 ASVe, *Senato*, Misti, reg.52, fol.82v., 28 March 1418; BNMarcianaVe, *Mss. It.*, VII, 2049 (8332/1-2), Morosini, *Cronaca*, II, fol.132

source 2 Sanudo, *Vitae*, col.920

catalogues d. Perrey (1850); Mallet (1853); Sieberg (1932b); Morelli (1942)

catalogue p. Shebalin *et al.* (1974)

In early 1418, a sequence of at least 18 earthquakes struck Slavonia (a territory covering present-day Slovenia, Croatia and Bosnia Herzegovina) and above all Dalmatia, i.e. the Adriatic coastal region of Croatia. On 7 March of that year, a strong earthquake damaged the walls and fortifications of the castle of Aurana (present-day Vrana), as well as one corner of the tower which stood in the middle of the settlement. No victims are recorded. The Aurana settlement was in the *contado* (a rural area subject to the urban authorities) of Iadera (now Zadar), at that time a possession of the Republic of Venice. It was about 30 km south east of the chief town. It was sometimes also called Levrana (the name used Morosini's chronicle), or Urana (used by the historian Sanudo).

Information about these earthquakes has been found in two Venetian manuscript

sources, namely an order of the Venetian Senate, and a chronicle in old Venetian by Antonio Morosini, a contemporary writer (a copy of his work is preserved in the Biblioteca Nazionale Marciana in Venice). Up to now, catalogues which listed this earthquake were unaware of these sources, for the information recorded by the seismological tradition either derived directly from Muratori's edition of Sanudo's *Vitae ducum Venetorum* (*Lives of the doges*) (Perrey 1850, p.20 and Mallet 1853, p.46), or can probably be traced back to it (Morelli 1942, p.10, cites Sieberg 1932b, which does not provide explicit bibliographical references).

On 28 March 1418, the 108 members of the Venetian Senate (ASVe, *Senato*, Misti, reg.52, fol.82v.) decided unanimously that the count and captain of Iadera — by whom they had been informed of events on 9 of that month — should be instructed to carry out repairs and reinforcements as rapidly as possible to the castle of Aurana, which had been damaged in the earthquake, sending skilled workmen to the site:

"1418 on 28 of March [...] A letter to be sent to the count and captain of Iadera in the following terms. We have read your letters, written on 9 of this month, informing us that the walls and fortifications of the castle of Aurana have been cracked and split open by an earthquake, which also caused one corner of the tower in the middle of the castle to collapse, and that to see what is required you immediately sent there two suitable persons, who recommend your sense of urgency and diligence in your loyalty to the *Consiglio dei Rogati*; and we therefore write to instruct you to carry out and arrange to be carried out the repair and defence of the places in question as best and as quickly as you can, so that the said place can be defended and protected in all circumstances for the honour of our rule, and you are to send as many master masons as you can for the necessary repair work, because the end and completion of the truces will soon occur, as you know".

MCCCCXVIII die XXVIII Martii. [...] Quod scribatur comiti et capitaneo Iadre in hac forma. Intellectis literis vestris datis nono mensis presentis per quas nobis significastis muros et spatios castri Aurane propter terremotus crepuisse et apertos fuisse et quendam angulum turris existentis in medio castri corruisse et vos subito illuc misisse duas personas sifficientes ad videndum illud quod erit necessarium reccommandantes sollicitudinem et diligentiam vestram fidelitati vestre cum nostris consiliis Rogatorum et addicione scribimus et mandamus quatenus providere et provideri faciatis ad reparationem et fortificationem loci predicti per illum quam meliorem et celeriorem modum poteritis ut dictus locus in omni casu bene custodiri et conservari possit ad honorem nostri domini mittendo quam plures magistros poteritis ad reparationem laboreriorum necesariorum quia in brevi erit finis et complementum treugarum sicut scitis.

Antonio Morosini, author of a contemporary chronicle, records that there were 18 shocks, and specifies the day on which Aurana was struck:

"We have recently heard a reliable report that in the Sclavania [Slavonia] area and throughout Dalmatia 18 earthquakes have occurred, greater than any others previously experienced, and the latest news is that many houses collapsed at Levrana [Aurana], as well as walls and buildings, and (the earthquake) has caused substantial damage, but we are told that nobody was hurt; (the earthquake) occurred on 7 March 1418".

A questi di avemo sapudo chomo s'ù dito de vero dele parte de Sclavania e per tuta la Dalmacia xviii taramoti, i maor s'à potudo sentir, e in l'ultima eser chazudo molte caxe dele mure dei edeficii de levrana, e fato de notabel dani, ma pur in le persone non s'ù sapudo sia stado de dano alguno, fose adi vij de marzo de M°IIII°XViii.

The information provided in the *Vitae ducum Venetorum* by the Venetian scholar and historian Marin Sanudo (1466-1536) is similar to that in Morosini's chronicle:

"On 7 of that month [April], it was reported that 18 very great earthquakes had

occurred throughout Dalmatia on various days and nights, causing the collapse of many houses and the walls of the *castello* of Urana”.

A' 7 del detto mese s'intese, essere per tutta la Dalmazia stati diciotto tremuoti in vari giorni e notti grandissimi, per lo che rovinarono assai case, e le mura del Castello dell'Urana.

Shebalin *et al.* (1974) wrongly date the earthquake to 17 April 1418.

▲ 1418 03 07

localities	lat.	long.	I
Vrana	43 57	15 34	VIII

< 273 > **1419 March 15 Bursa [north-western Turkey]**
 ▷ **landslide, new springs, rivers bursting their banks** <

sources al-Maqrizi, *al-Suluk*, IV, I, pp.482-83; Ibn Hajar, *Inba'*, III, p.192
 literature Taher (1979); Ambraseys and Jackson (1998); Ambraseys (2002a)
 catalogues d. Ambraseys and Finkel (1991); Evangelatou-Notara (1993); *Papazachos and Papazachou (1997)
 catalogues p. Ergin *et al.* (1967); Poirier and Taher (1980)

On 15 March 1419, a violent earthquake, accompanied by a thunderous noise, damaged the town walls of Bursa (according to the Arab source) and all the houses in the town. It probably had its origin in the north-western sector of the north Anatolian fault. The shock was perceived to move from west to east, and the various effects on the ground bear witness to its violence. An enormous piece of rock split off a mountain; new springs gushed forth in a valley, and many rivers burst their banks. Local people took refuge outside the town. The succession of shocks lasted for three days; and during the next forty days there were from one to four shocks every day. The seismic sequence lasted for about a year. Information about the earthquake is to be found in the work of al-Maqrizi, a contemporary Arab historian:

“During the afternoon of Tuesday 17 *Safar*, in the town of Bursa, in the land of Rum [the Byzantine empire], there was an earthquake which lasted for three days and nights. The walls of the town were damaged, and there was no house which was not affected by the shock. A rock as big as half an Egyptian pyramid split off a mountain and crashed to the ground. Many springs gushed forth in the Al-Azraq valley. Many rivers burst their banks. The earthquake movement was from west to east, and it was accompanied by a thunderous sound similar to that of horses' hooves. After the first three days, the earthquake continued for forty days, giving rise every day to one or two shocks, or three or even four. People took refuge outside the town. The shocks lasted for about a year”.

في شهر صفر اتفق العصر يوم الثلاثاء سابع عشرة حدوث زلزلة بمدينة برصا
 منسكة الروم استمرت ثلاثا أيام بلياليها لا تهد فسقط سور المدينة وخرت عامة
 دورها بحيث لم يبق بها دار إلا سقطت أو هدم بها شيء وانقطع من جبل قطعة في
 قدر نصف هرم مصر وسقطت إلى الأرض وتفتحت عدة أعين من وادي الأزرق
 وأنظمت عدة أنهر وكانت الزلزلة تأتي من جهة المغرب إلى جهة المشرق ولها دوى
 كركز الخيل ثم امتدت الزلزلة بعد ثلاثة أيام مدة أربعين يوما تعود كل يوم مرة
 أو مرتين وثلاث وأربع حتى خرج الناس إلى الصحراء ثم تبادت سنة.

There is a very brief reference to this earthquake in Ibn Hajar, another contemporary Arab writer, in a passage, containing some chronological mistakes, about a solar eclipse and an earthquake at Erzincan (see the next entry).

Ergin *et al.* (1967, p.18, no.173), wrongly date the earthquake to the year 1415;

Papazachos and Papazachou (1997, p.195) give it an intensity of grade IX MM and a magnitude of 6.8. Poirier and Taher (1980, p.2193) give an intensity estimate for Bursa of between grade X and XI MM.

▲ 1419 03 15 the afternoon

localities	lat.	long.	I
Bursa	40 11	29 04	VIII

< 274 > **1419 March 26 Erzincan [eastern Turkey]**

sources Ibn Hajar, *Inba'*, III, p.192; al-'Ayni, *Iqd*, XXV, p.481
 literature Taher (1979)

This event is recorded in Taher (1979) but is not known to the seismic catalogue tradition. It is likely that an earthquake killed a large number of people at Erzincan (according to the Arab source) on 26 March 1419. No other information is recorded.

The sources are two contemporary Arab writers: Ibn Hajar and al-'Ayni. Ibn Hajar maintains that the earthquake occurred on 29 *Rabi' I* in the year 822 of the Hegira (which corresponds to 25 April 1419) on the same day as an eclipse of the sun. According to Oppolzer's eclipse catalogue (1887, p.252, chart 126) there was a partial eclipse of the sun on 26 March 1419 which could be seen in Egypt. We therefore think it preferable to date the earthquake to 26 March 1419 rather than 25 April, though the chronology of the event remains partly uncertain. Ibn Hajar writes:

"On 29 *Rabi' I*, before sunset, there was an eclipse of the sun. The people gathered in the al-Azhar mosque [in new Cairo] praying and observing all the requirements of supererogatory prayers. On the same day there was an earthquake in the city of Arzakan [Erzincan] which killed many people".

وفي تاسع عشرين شهر ربيع الأول كسفت الشمس قبل الزوال فاجتمع الناس بالجامع الأزهر فضليت بهم صلاة الكسوف على الوصف المعروف في الأحاديث الصحيحة بركوعين مطولين وقيامين مطولين وكذلك في جميع الأركان المقصورة وغير المقصورة ثم خطبت بهم ما يقتضى ذلك بعد أن تجلت الشمس والحمد لله واتفق حدوث زلزلة في هذا اليوم في مدينة أرزنكان هلك بسببها عالم كثير

Al-'Ayni records the same information as Ibn Hajar.

▲ 1419 03 26

localities	lat.	long.	I
Erzincan	39 44	39 30	VIII-IX?

< 275 > **1419 December 19 - 1420 January 16 [Dhu'l-Hijja 822 H.] Istanbul [north-western Turkey] ▷ tsunami? ◁**

sources al-Maqrizi, *al-Suluk*, IV, I, p.513; Ibn Hajar, *Inba'*, III, p.192; al-'Ayni, *Iqd*, XXV, p.481
 literature Taher (1979)
 catalogues d. Evangelatou-Notara (1993); *Papazachos and Papazachou (1997); Ambraseys (2002b)
 catalogues p. Poirier and Taher (1980)

On an unspecified day between 19 December 1419 and 16 January 1420 (corresponding to the month of *Dhu'l-Hijja* in the year 822 of the Hegira) Istanbul (according to the Arab source) was struck by a strong earthquake which caused damage (unspecified) in

many places. There was probably a tsunami as well, though the sources simply refer to unusual tides. The most important source is al-Maqrizi, a contemporary Arab scholar and antiquarian: "In the month of *Dhu'l-Hijja* the earth shook at the city of Istanbul. There was damage in many places there and the sea had unusual tides".

في شهر ذي الحجة زلزلت مدينة اصبوبول و عدة مواضع هناك حتى كثر اضطراب البحر وتزايد تزايداً غير العهود.

Ibn Hajar and al-Ayni, two contemporary Arab writers, refer very briefly to damage to buildings in Istanbul. The context does not make it clear whether the tides referred to by al-Maqrizi are linked to the earthquake or were an independent phenomenon. Ambraseys (2002b) thinks it was a tsunami in the Sea of Marmara. The event is not mentioned in Byzantine sources. Although this is a very unusual case, there is nothing to suggest that al-Maqrizi's report is not reliable.

Poirier and Taher (1980) wrongly date the earthquake to 11 May 1419, and give it an intensity of grade IX MM. Evangelatou-Notara (1993, p.99) and Papazachos and Papazachou (1997, p.195) date it to 25 May 1419; and the latter give it an intensity of grade VI MM and a magnitude of 6.6. The variety of intensity values is a natural result of the generic nature of the historical record, based solely on Arabic sources.

▲ 1419 12 19 – 1420 01 16 [*Dhu'l-Hijja* 822 H.]

localities	lat.	long.	I
Istanbul	41 02	28 57	VI-VII?Ts?

< 276 > 1420 July Thessaloniki [Greece]

sources *Notulae*, in Kugéas (1914-19, p.151, no.79)
 catalogues d. Evangelatou-Notara (1993); *Papazachos and Papazachou (1997)

In July 1420, a sequence of violent earthquakes caused serious damage in the city of Thessaloniki, including extensive collapses. Information about these earthquakes can be found in a series of notes written by an official of the city of Thessaloniki, preserved in manuscript *graecus* 2953, folio 5v. in the Bibliothèque Nationale de France (published in Kugéas, 1914-19, p.151, no.79). Amongst reports of other disasters in 1420, we find: "[...] and at that time there were repeated earthquakes, and especially in the month of July they were so strong and violent that they almost caused the entire city of Thessaloniki to collapse".

[...] καὶ σεισμοὶ πολλοὶ ἐπῆλθον διαφόρως ἐν τῷ τοιοῦτῳ χρόνῳ· μάλιστα ἐν τῷ ἰουλίῳ μηνὶ ἰσχυροὶ καὶ μεγάλοι σχεδὸν πτώσιν ἀπειλοῦντες πάσῃ τῇ πόλει Θεσσαλονίκη.

▲ 1420 07 – cumulative effects

localities	lat.	long.	I
Thessaloniki	40 38	22 56	IX

< 277 > 1421 January 21 Argos [Greece]

source *Chron. min. Byz.* 32.36, 33.31, in Schreiner (1975, p.235, p.248)
 inscription in the monastery of the Theotokos Artokosta, near Argos, in Feissel and Philippidis-Braat (1985, p.347, no.85)
 historiography Schreiner (1977); Evangelatou-Notara (1986-87)
 catalogues d. Grumel (1958); *Papazachos and Papazachou (1997)

According to a hagiographical tradition, there was an earthquake at Argos on 21 January 1421, but we have no other information about it. Evidence from an inscription that restoration of the monastery of Artokosta was completed in July-August 1425 may be related to this hypothetical seismic event, but it does not mention seismic phenomena or anything else as the cause of the damage. The monastery of *Artokosta* (or *Moni Eortakoustis*) rises in an isolated position about 40 km south of Argos. It is the earliest monastic settlement in Kynouria, the province on the western shore of the Gulf of Argos. The earthquake is mentioned, using a customary hagiographical topos, in the *Chronicle of Argos and Nauplion* and the *Short Chronicle of the year 1423*. When the remains of St. Peter of Argos were taken to Nauplion on 21 January 6929 [1421]:

"[...] those who were there say that when they opened the holy tomb there was an earthquake in that place, and there came forth a very sweet scent, which filled the earth and the air".

[...] φασὶ δὲ οἱ ἐκεῖσε εὐρεθέντες, ὅτι ὅταν ἤνοιξαν τὸν ἅγιον τάφον ἐκεῖνον, ἐγένετο σεισμός ἐν τῷ τόπῳ καὶ ἐξῆλθεν εὐωδία πλείστη καὶ ἐπλήρωσε τὸν χώρον καὶ τὸν ἀέρα.

For the hagiographical tradition relating to this phenomenon, see Evangelatou-Notara (1986-87, pp.443-4). While keeping in mind the almost legendary context of this account, we can reasonably link it to an epigraphic evidence.

□ - in the monastery of Artokosta, there is a marble slab bearing an inscription relating to the restoration of the monastery:

"The holy and sacred monastery, which takes its name from that venerable monastery of our lady the mother of God said Artokosta, was restored during the reign of our very pious emperor John Palaeologus, thanks to a donation from the very honourable lord Antonios Sarantari during the headship of the hieromonk and archimandrite Theodulus, in the year 6933 [1 September 1424 - 31 August 1425]".

Ἀνεκαινίσθη ἡ σεβασμία καὶ θύα καὶ ἱερά μονὴ ἧς ὄνομα τιμωμένη τῆς ὑπεραγίας δεσποίνης ἡμῶν Θεοτόκου καὶ ἐπικεκλημένης Ἀρτοκοστᾶς. Ἐπὶ τῆς βασιλείας τοῦ εὐσεβεστάτου βασιλέως ἡμῶν Ἰωάννου τοῦ Παλαιολόγου, διὰ συνδρομῆς τοῦ τιμητοτάτου κύρ Ἀντωνίου Σαραντάρη, Ἡγουμενεύοντος Θεοδούλου ἱερομονάχου ἀρχιμανδρίτου, ἐν ἔτει κ'λλγ'.

The reference to John VIII Palaeologus as sole emperor allows us to date the completion of restoration work to the period between 21 July (when the emperor Manuel II died) and 31 August 1425.

▲ 1421 01 21

localities	lat.	long.	I	localities	lat.	long.	I
Monastery of Artokosta	37 18	22 46	B(VIII)?	Argos	37 38	22 44	F?

< 278 > 1421 September 18 Negroponte island [Greece]

source 1 - BN Marciana Ve, *Mss. It.*, VII, 2049 (8332/1-2), Morosini, *Cronaca*, II, fols.316-7

source 2 - Sanudo, *Vitae*, col.940

catalogue d. - Perrey (1850)

Starting on 18 September 1421, the island of Negroponte (present-day Euboea) was struck by earthquakes which are described as "great". Some houses and churches collapsed at locations which are not identified by the source. The shocks lasted for four days, and local people took refuge in the forest at night. Information about this earthquake is to be found in the manuscript *Cronaca* by Antonio Morosini, a contemporary writer. The text is in old Venetian, and proves to be somewhat obscure in places:

"In the year 1421, on 18 October Here in Venice we have received news from Negroponte. In many letters which have reached us from those parts, our (fellow citizens) have written that when they reached Negroponte, they found the place in a state of great fear because of the many earthquakes which occurred from 18 September for four days, day and night, and very strong. These earthquakes caused the collapse of walls and houses in various places, and some houses and churches in the island were razed to the ground, provoking expressions of dismay in everyone, and some people spend day and night in the squares [...], saying that this had been forecast 15 days before by a Greek priest who went to do penance on a mountain, and he also said that in addition to those earthquakes some rains and violent storms would follow, and there would be a great flood, and he said that God always does what is best for Christians".

Corando M°IIII°XXI, a di XViii otubrio. Avesemo a Viniexia vegnudo nuove dale parte de Negroponte che adi XViiij del mexe de setenbrijo, e per molte letere vezude de quele parte per i nostri aver scritto, che zionti in Negroponte aver trovado la tera molto spaventada per molti taramoti per IIII zorni stadi là, di e note, molto grandi, per i qual ano sgonbrado la tera in pluxor luogi dele mure e caxe, e in l'ixola abatudo zoxo fin l'abiso in tera, chon algune caxe e gliexie, per le qual tute persone qua, e quei puochi, stano zorni e note sovra le piazze [...], digando che questo i fo prononciado per XV zorni per uno chaloiero, ch'è stado a far penitencia in una montagna, e plui anchora che 'l dixè che oltra questi taramoti doveva vegnir algune pluobe con tenpeste grose che faria gran abiso, digando 'che Dio fazi senpre el mejo di cristiani'.

The information provided in the *Vitae ducum Venetorum* by the Venetian scholar and historian Marin Sanudo (1466-1536) is briefer than that in Morosini's chronicle:

"On 18 September in Negroponte, there were such great earthquakes for four days that people feared for their lives and slept in the forest. And very heavy rains occurred, and violent storms. And yet they suffered in the open air like that for fear of earthquakes".

A' 18 di Settembre a Negroponte furono grandi tremuoti per giorni quattro, adeo che per dubbio della vita si dormiva alla foresta. E vennero grandissime piogge e tempeste grosse. E pure coloro pativano stando così all'aria per dubbio de' tremuoti.

▲ 1421 09 18 cumulative effects

localities	lat.	long.	I
* Euboea	38 30	24 14	VIII

< 279 > 1422 April 13 Western Peloponnese [Greece] ▷ fissures ◁

sources 1 BN Marciana Ve, *Mss. It.*, VII, 2049 (8332/1-2), Morosini, *Cronaca*, II, fols.332-3; *Chron. min.* Byz. 33.29, in Schreiner (1975, p.247)

source 2 Sanudo, *Vitae*, cols.941-2

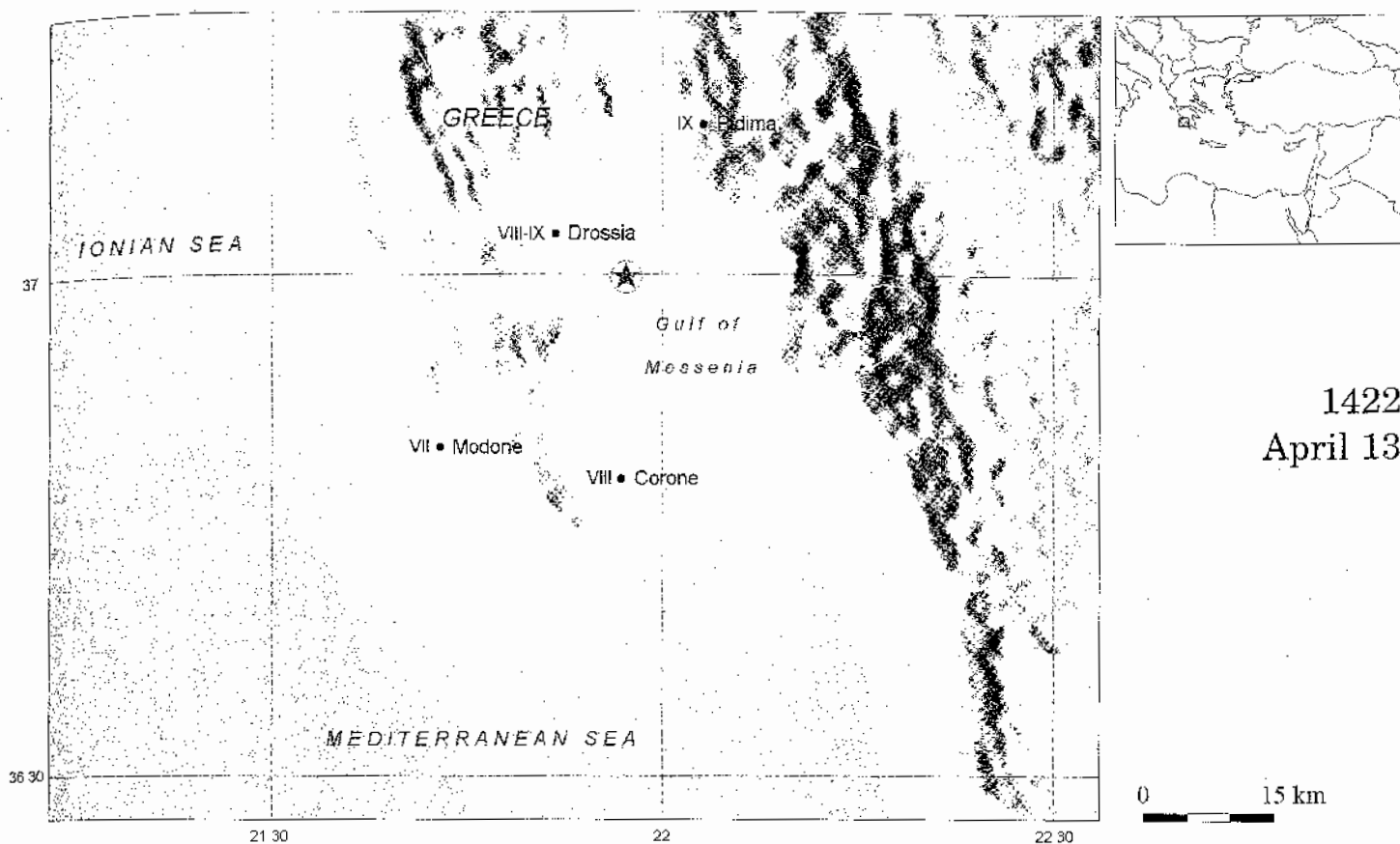
literature Schreiner (1977); Loenertz (1984); Evangelatou-Notara (1986-87)

catalogues d. Sieberg (1932b); Grumel (1958)

catalogues p. Bektur and Alpay (1988); Evangelatou-Notara (1993)

On 13 April 1422 at about 0:10 UT, a prolonged earthquake occurred on the south-west coast of the Morea (now Peloponnese). It is described as "very great".

The town walls collapsed at Corone (now Koroni), as well as a great many battlements, and all its towers were badly damaged. More than 40 houses collapsed. Buildings which remained standing were so badly damaged that they had to be demolished. Some houses suffered more damage than others, but no dwelling was left intact. The total number of victims is not known, as the most detailed source, Morosini's chronicle, seems to refer only to the death of two people of Venetian origin.



1422
April 13

fig. 105

In the surrounding countryside, a number of houses and many churches collapsed, but there were no victims. The earthquake caused cracks to open in the ground. There were a great many collapses at an unidentified place called *Chosonina*, and only one tower remained standing; there were many victims. Pidima was completely reduced to ruins; the collapse of one tower caused the death of 10 people. Drossia was half reduced to ruins, and there were 55 victims. Damage at Modone (present-day Methoni) was less severe, but a large proportion of its dwellings were badly damaged. The faithful held a number of processions in both the town and the surrounding countryside.

Information about the earthquake can be found in two reliable sources: one of these is the manuscript *Cronaca*, in old Venetian, by Antonio Morosini, a contemporary writer. This chronicle is unknown to the seismic catalogue tradition, which has only used a Byzantine source, known as the *Short Chronicle of Morea, 1423*. Antonio Morosini made use of information which reached Venice on 17 April and 5 May, a few days after the earthquake. He provides a very detailed description of its effects and the reaction of the people involved:

"In the year 1422. News reached Venice on 17 April from our castles of Modone and Corone of the great damage suffered there. They have written to Venice as follows: that on Easter Sunday as Monday approached, about half way through the sixth hour of the night, there was a very great and prolonged earthquake. More than 14 houses collapsed, and by the grace of God only two people were killed: firstly, a certain Giacomo da Sarzana together with his son and wife; and a daughter of his was pulled out alive, and everyone else survived, some because they had fled from home and others because beams held back the load and prevented it from falling. And all the other houses left

standing were so badly split open that they had to be demolished. The earthquake damaged some severely and others slightly, but none was left intact, and we learned that all the towers were reduced to ruins and the town walls collapsed as well as a great many battlements, and the ground opened up in many places, and the men of the town were frightened, and out in the countryside a number of houses and many churches collapsed, but by the grace of God no-one was killed in the surrounding countryside. The whole of Chosonina collapsed and was left roofless. Many people were killed and all the others were injured and only one tower remained standing, and a great many people were killed and injured. Pidima was completely reduced to ruins. The tower of Pazi collapsed, and its custodian was killed, together with his wife and 8 other people. Drusia [Drossia] is more than half reduced to ruins, and they say that 55 people were killed there. And we have learned that Modone was not so badly damaged, and they write that if there was another similar event, which God forbid, the whole village would be swallowed up, because everything that remains standing is damaged from top to bottom, and great processions and prayers were held by both the Greeks and Latins, but especially by the Greeks. Throughout the night, instead of sleeping, they go around the village and out into the countryside crying out *kyrie eleison*. There is a good deal of animosity in that village and people do not like one another, but now they have all become friends and have forgiven one another, and they kiss one another on the mouth like brothers, and they live in great fear both of more earthquakes and of epidemics, for they say that epidemics come after earthquakes, and at Modone they are beginning to lament and pray to God to forgive us our sins and have pity on us, amen. This news was received in Venice on Tuesday, 5 April".

Corando M^oCCCCXXij. Vene nuove a Venexia, del mexe d'avril a di XVij, como ale parte di nostri casteli Modon e de Coron eser sta' scritto a Venexia de i gran dani seguidi in quelli paixi, e in questa forma eser scritto, che la domenega de Pasqua vignando al luni in sule Vi hore e meza de note fexese uno taramoto grandissimo, el qual durò molto, e chazete plu' de XL caxe in tera, e avesemo per la gracia de Dio non de mori se non do persone, prima uno Jachomo da Sarzana con uno fio e so' muier, e una so' fia fo tirada via viva, e tuto lavanzo schapola, chi per schanpar de caxa, e chy per travamenta che suspendeva e rezeveva el cargo, e tuto lo resto de 'ste caxe che se romaxe in pie', qual xe tute averte, che 'l bexogna per muodo gitarle in tera, e qual xe sfese ase, e qual puocho, ma non che 'l de sia pero alguna sana. E avesemo che tute le tore xe fese e chazude le mure e merli asaisimi, e in asè luogi eser averta la tera e spaventadi i omeni dela tera, e fuora per i chaxali eser chazudo ase chaxe, e molte gliexie, ma per la dio gracia, el non de xe morto algun qua per i circhonstanti caxali del paixe. Lè chazudo tuta la Chosonina, e xe descabitada, e mortonde ase persone, e l'avanzo schanpade, e non nesor romaxo se non una tore in pie', e asai homeni morti e schanpadi, e 'l pedima tuto derupado la tore de pazi xe chazuda e morto lui e so' muier chon Viiij persone dentro. Drusia xe plu de meza derupada e cusi fo dito eser morty LV persone, e avemo abudo Modon non aver abudo tanto dano. E avesemo eser scritto chel se de fexe uno altro simel fato, che Dio nol permeta, che tuto el paixe s'abiseria, la caxion che tutto quello che xe romaxo in pie eser averto infin ala tera. E avesemo le precesion e oracion xe grandissime si di grexi chomo di latini, ma spizialmenti i griexi, che tuta la note quelli non dorme, andando per la tera, e de fuora per i chaxali cigando cusi 'chiere leixon'. I odii grandi e in quella tera che alzano non se voia ben lun laltro, e al prexente tuti son fati amixi, e ase perdonado tuti, e baxadose per la bocha chomo fradeli, e vivese chon gran paura si de plui taramoti chomo de muoria, perche el se dixè, che driedo i taramoty vien la muoria, e a Modon se chomenza a lamentarse, prezemo Dio che non varda ai nostri pechadi, e che labia remision de nui amen. Rezevude queste nuove in Venexia el marti di a di V d'avril.

The date given by Morosini at the end of the passage quoted must surely be corrected from 5 April to 5 May, partly to make it fit the rest of the information he provides, and

also because 5 May was indeed a Tuesday. The Venetian scholar and historian Marin Sanudo (1466-1536) provides a much more succinct account than Morosini:

"At this time our castellans at Modone and Corone were also responsible for the castles of Grixo and Antivari. And information came by letter that there had been a very great earthquake, which reduced more than 40 houses to ruins. There were only two victims. But it caused great damage, and every day the Greeks and Latins held processions around the village, crying *kyrie eleison*. And then there came an epidemic".

In questo tempo i nostri Castellani di Modone e Corone ebbero i Castelli di Grixo, e di Antivaro. E per le sue lettere s'intese com'era stato ivi un grandissimo tremuoto, per lo che caddero e rovinarono più di 40 case. Morirono solum due persone. Ma fece grandi danni, e ogni dì si faceva Processione di Greci e di Latini, andando per la Terra gridando Kyrie Eleison. E poi venne il morbo ivi.

The more extensive manuscript tradition of what is known as the *Short Chronicle of Morea, 1423* gives a general account of the earthquake:

"In the year 6930 [1 September 1421 – 31 August 1422], on the second day of Easter week [13 April], there was a great earthquake, and immediately afterwards plague began to disseminate mourning in the Morea".

ἔτους ς'αλ', τῆ δευτέρᾳ τῆς Διακαινησίμου, ἐγένονεν ὁ μέγας σεισμός, καὶ εὐθέως ἤρξατο εἰς τὸν Μωρέαν σποράδην λυμαινέσθαι τὸ θανατικόν.

The earliest version of the chronicle (see Loenertz 1984) says that the earthquake affected "the whole of the Morea". The source already transcribed is the only one used in Evangelatou-Notara's (1993) catalogue.

▲ 1422 04 13 0:10 UT ⊛ = 37 00 21 57 I₀ = VIII-IX Me = 5.8 Sites: 5

localities	lat.	long.	I	localities	lat.	long.	I
Pidima	37 09	22 03	IX	Koroni	36 47	21 56	VIII
Chosonina	— —	— —	VIII-IX	Methoni	36 49	21 42	VII
Drossia	37 02	21 52	VIII-IX				

< 280 > 1422 June 28 Cairo [Egypt]

source 1 Ibn Hajar, *Inba'*, III, p.273

source 2 al-Suyuti, *Kashf*, p.57

literature Taher (1979)

catalogue d. *Ambraseys *et al.* (1994)

On 28 June 1422, there was a weak earthquake at Cairo which did not cause any damage. Information about the earthquake can be found in the work of Ibn Hajar, a contemporary Arab historian:

"On 8 Rajab there was a minor earthquake at new Cairo (Al-Qahira)".

في ثامن من رجب حدثت بالقاهرة زلزلة لطيفة.

The earthquake is also reported by al-Suyuti, who gives the above passage from Ibn Hajar as his source. Ambraseys *et al.* (1994, p.102) give it an epicentral intensity of class F, which is equivalent in their classification to a range from felt to strong (up to grade VI MSK).

▲ 1422 06 28

localities	lat.	long.	I
Cairo	30 03	31 15	III-IV

< 281 > 1425 June 23 Cairo [Egypt]

- sources 1 BNFrance, *ms. Ar. 1544*, al-'Ayni, *Tqd*, fol.174r.; *ms. Ar. 5762*, The continuer of Ibn Duqmaq, fol.145r.; Ibn Hajar, *Inba'*, III, p.348; al-Jawhari, *Nuzhat*, III, p.95; Ibn Iyas, *Badai'*, II, p.99
- sources 2 al-Suyuti, *Kashf*, p.57
- literature Taher (1979)
- catalogue d. *Ambraseys *et al.* (1994)

At dawn on 23 June 1425, Cairo was struck by an earthquake. The numerous 15th century Arab sources which describe it disagree in part as to both its chronology and effects. According to some sources, the ground first swayed three times, grew calm, and then began to shake again: houses, other buildings and minarets were seen to shake, and people fled in terror from their homes; but there was very little damage. Three days of fasting were ordered. Other sources, however, claim that the earthquake was a minor one, and that a large proportion of the populace was unaware of it.

Information about the earthquake is to be found in the works of numerous 15th century Arab historians and men of letters. Al-'Ayni is one of the writers who claim that the earthquake was not very strong:

"Other events in the year 828 [of the Hegira]: on Saturday 6 *Sha'ban* in that year [23 June 1425] an earthquake began at sunrise and this was a difficult time. But the Almighty, to whom be glory, took pity on the Muslims and stopped it at once. The earthquake was by no means strong, and so most people did not feel it".

ذكر بقية حوادث سنة ثمانية وعشرين وثمانمائة منها ان في يوم السبت السادس من شعبان من هذه السنة جاءت زلزلة وقت طلوع الشمس وكان وقتا صعبا ولكن الله تعالى عز وجل لطف بالمسلمين واسكنها على الفور ولم تكن قوية حتى ان غالب الناس لم يحسوا بها.

The description provided by al-Jawhari is similar to that of al-'Ayni:

"On Saturday 6 *Sha'ban* [23 June], there was an earthquake at sunrise which struck great fear into Muslims, but God was kind to them and calmed it immediately; so the earthquake did not continue, with the result that most people were not even aware of it".

يوم السبت السادس من شعبان حصلت زلزلة وقت طلوع الشمس و حصل للمسلمين منها رعب شديد، و لكن الله لطف بالمسلمين و أسكنها على الفور و لم تستمر حتى ان غالب الناس لم يشعروا بها.

Ibn Hajar gives the date as 4 July, but is probably referring to the same earthquake:

"On 17 *Sha'ban* [4 July], the earth shook in old and new Cairo for about two *daraja* [about 8 minutes]. Apart from the terror it caused, very little harm was done".

في السابع عشر من شعبان زلزلت الأرض بمصر والقاهرة قدر درجتين وكان أمرا مهولا إلا أن لم يقع بها هدم شيء من الأماكن إلا اليسير.

Ibn Iyas does not give the day and month of the earthquake, and places it at sunset instead of dawn:

"In that year [828 of the Hegira = 23 November 1424 - 12 November 1425], towards dawn, there was an earthquake in new Cairo. Houses moved, as well as other buildings and minarets, to the extent that they almost collapsed; but no-one was killed. The ground swayed three times, grew calm, and then started shaking again; and people then fled from their homes towards the *suq* [markets]".

و فيه وقعت زلزلة بالقاهرة وقت غروب الشمس، و قد تحركت الدور و الأماكن و المآذن، حتى كادت أن تسقط على الأرض، لكن لم يمت فيها أحد من الناس، و قد ماجت الأرض ثلاث مرآت، و هي تسكن ثم اضطرب، فهجت الناس من الدور إلى الأسواق.

The anonymous continuer of Ibn Duqmaq dates the earthquake to the month of

Ramadan [17 July – 15 August], but he too suggests that the shock occurred at dawn. We therefore think that this is still the same earthquake:
 “in the month of *Ramadan* in this same year [828 of the Hegira = 17 July – 15 August 1425] the earth shook at sunrise”.

وفي شهر رمضان سنة تاريخه ... وفيه تزلزلت الارض عند طلوع الشمس.

Al-Suyuti simply records that fasting was ordered:
 “Because of the earthquake, a three-day fast was ordered”.

ونودي بصوم ثلاثة أيام من أجل الزلزلة.

This earthquake is not recorded in Poirier and Taher (1980). On the basis of the earthquake's duration and the lack of information from Syria and the eastern Mediterranean, Ambraseys *et al.* (1994, pp.47, 102) suggest that the earthquake may have had its origin in the Gulf of Suez region, and give it an epicentral intensity of class S, which is equivalent in their classification to a range from between strong and damaging (approximately VI to VII MSK).

▲ 1425 06 23 3:00 UT

localities	lat.	long.	I
Cairo	30 03	31 15	VI?

< 282 > 1427 March 13-19 Amer Catalonia [Spain]
 ▷ fissures, gas emissions ◁

< 283 > 1427 April 22 Sant Julià del Llor ▷ fissures, gas emissions ◁

< 284 > 1427 May 15 Olot

< 285 > 1427 June 17 Caldes de Malavella
 ▷ fissures, appearance and disappearance of springs ◁

< 286 > 1428 February 2 Puigcerdà and Camprodon

sources 1 *Flosculi*, in Girbal (1889, pp.48-61, 75-84); *Manual de Novells Ardits*, I, p.251;
 Report of a Carthusian monk, in Del Valle (1996, pp.80, 82, 84, 86, 88);
 Report of the prior of the monastery of the Valley of Jesus Christ, in Del Valle (1996, pp.92, 94, 96); Hebrew chronicle of Girona, in Del Valle (1996, pp.39-77, odd pages);

source 2 Comes, ed. 1878

literature Banda and Correig (1984); Riera Melis (1992); Olivera *et al.* (1992b); Goula *et al.* (1992); Riera *et al.* (1992); Lambert (1993); Riera Melis *et al.* (1993); Olivera *et al.* (1994b); Del Valle (1996); Olivera *et al.* (1999)

catalogues d. Bonito (1691); Perrey (1847); Mallet (1853); Taramelli and Mercalli (1886); Sieberg (1932b); Fontserè and Iglésies (1971); Lambert *et al.* (1996); *Atlas sísmic de Catalunya* (1999); Martínez Solares and Mezcua Rodríguez (2002)

History of the earthquake's interpretation

Since the early 1980s and throughout the 1990s, the seismic sequence which struck Catalonia, and especially the diocese of Girona, between late February 1427 and February 1428, has been the subject of interdisciplinary studies by medieval historians and seismologists as well as geologists and geophysicists. Since the earthquakes also affected French territory, they have attracted the attention of French as well as

Catalan scholars. The particular interest in this seismic sequence is due to the fact that it is the most important high intensity sequence in historical times to strike the Catalonia region, which seems to be characterised by long periods of quiescence punctuated by seismic crises. Although the numerous studies now available provide in large part a steady increase in our knowledge of the effects and location of this complex seismic sequence, we still do not have a comprehensive and systematic study in which the sources are published and critically analysed.

Recent work began with a study by Banda and Correig (1984), who attempted to establish the effects of the earthquake of 2 February 1428. On the basis of information culled from Fontserè and Iglésies (1971) — a fundamental point of reference and departure for all studies on the historical seismicity of Catalonia — Banda and Correig (1984) attributed a grade of intensity on the MSK scale to 44 of the 45 locations identified, and drew up an isoseismic map of the earthquake.

A second group of investigations appeared in 1992. The first results from new studies made within the ambit of investigations into the seismicity of border areas (CEC project, *Review of Historical Seismicity in Europe*) were presented by Olivera *et al.* (1992). In their brief survey, the authors provide a revision of information in earlier catalogues based on secondary sources, as a result of research carried out in the central archives of the Crown of Aragon — especially the Royal Chancery collection — their aim being to distinguish between the effects of earthquakes in 1427 and those of the shock of 2 February 1428. Olivera *et al.* (1992b) also emphasise the importance of a new unpublished source, not previously utilised by the Catalan seismological tradition. This is a record of a pastoral visit to the diocese of Girona in 1432. On the basis of this source, the authors have drawn a map in which church buildings in the diocese of Girona are placed in one of three categories: "destroyed", "damaged" or "undamaged". Riera *et al.* (1992) set out the details of a field visit to the most significant places struck by the 1427-28 earthquakes, delineating two almost parallel itineraries. The seven stages of one of these illustrate the local morphology and most interesting geological structures, while the five stages of the other show that signs of earthquakes from as long ago as the early 15th century are still visible in buildings at the worst damaged localities.

A third group of studies was published in two volumes (1993, 1994), bringing together materials for the above-mentioned CEC project, *Review of Historical Seismicity in Europe*. Lambert (1993) discusses the effects of the shock of 2 February 1428 at 13 locations in France, and gives the text of what are thought to be the most reliable sources. Riera Melis *et al.* (1993) take up the preliminary study by Olivera *et al.* (1992b) of the 1432 pastoral visit to the diocese of Girona, and investigate it more thoroughly. The original document is in the Girona diocesan archives. Pastoral visits were carried out periodically by bishops or their representatives and recorded the state of ecclesiastical buildings at the time of the visit. A pastoral visit to the diocese of Girona was carried out by bishop Joan de Casanova between 3 August and 15 December 1432. He visited more than 400 church properties — a very high number for the late medieval period. The document concerned is very important in providing a record of damage, but it does not permit a distinction between the effects of the various shocks, and therefore only provides a cumulative picture of effects. In their study, Olivera *et al.* (1992b) have identified the location of 360 of the 387 buildings analysed, and have placed the earthquake effects in five categories: buildings completely destroyed, largely destroyed, partly destroyed, slightly damaged, and without appreciable damage. They have also drawn a map showing these buildings in terms of the above five categories, but they do not provide a list of the localities affected or of the buildings concerned.

Olivera *et al.* (1994b) took the data provided in the catalogue by Fontserè and Iglésies (1971, based on secondary sources), and tracked the ways in which the information

was transmitted, in an attempt to identify the original sources. They therefore carried out archive research in the historical, municipal, diocesan and capitular archives of a large number of towns: Barcelona and Madrid for central archives; Girona, Olot, Camprodon, Sant Joan de les Abadesses, Seu d'Urgell, Vic, Cervera, Lleida, Balaguer, Tàrraga, Terrassa, Manresa, Igualada and Tortosa for outlying archives. The results of their work lead them to draw the following conclusions: of the 20 earthquakes listed in Fontserè and Iglésies (1971) as dating to between 1420 and late 1427, seven are considered to be false events, including one classified as having an epicentral intensity of grade VII (MSK); and the impact of another earthquake is considerably reduced. Only two events in the seismic sequence of 1427 are shown to have been destructive, namely the one dated 15 March, with its epicentral area in the village of Amer, and that of 15 May, with its epicentral area in the town of Olot. In studying the earthquake of 15 March, the authors have only used primary sources dating to before the earthquake of 15 May; and for this latter earthquake, they have only used primary sources dating to before 2 February 1428. In this way, Olivera *et al.* (1994b) have been able to identify and locate the towns which suffered most damage in these two earthquakes; and they have also superimposed on the map of buildings involved in the pastoral visit of 1432 (as in Riera Melis *et al.* 1993) the outlines of the two areas of major effects of the earthquakes of 15 March and 15 May, and the fault systems outlined in Goula *et al.* (1992).

When taken together with the chronicles of the city of Barcelona, the new unpublished sources — especially the decisions of the council of the French town of Pamiers — have made it possible for Olivera *et al.* (1999) to provide a more accurate chronology for the 1427 earthquakes, thereby partly modifying previous conclusions. Olivera *et al.* (1999) have reduced the intensity of the shock of 15 March, which had in fact been preceded by two other shocks on 13 and 14 March; and they have also identified another destructive shock, on 19 March, which was more powerful than the previous ones. Other earthquakes, having an intensity comparable to that of the shocks of 13 and 14 March, have also been identified and dated to 22 April and 17 June.

Of particular interest amongst new published sources is the critical edition of a work in Hebrew, edited by Del Valle (1996). The original manuscript is in the Bayerische Staatsbibliothek in Munich (manuscript 307). The work in question is a chronicle by an anonymous Jew living in Girona, and was very probably written in June 1427, since the last entry refers to the 18th of that month. The author was an expert in astronomy and well acquainted with the earthquake theories of some ancient Greek and rabbinical writers. Del Valle's book (1996) also provides a complete edition of two anonymous 1427 Latin chronicles which were compiled in Cistercian monastery circles. The two brief chronicles concerned are in the Österreichische Nationalbibliothek in Vienna (ms. 3529, fols.153v.-154v.) and the Public Library in Danzig (manuscript Mar F.256). The Latin and Hebrew texts of these three sources are accompanied by a Spanish translation, and there are also facsimiles of the originals. Rubió (1961) published some fragments of the Vienna chronicle; and the text of the Danzig chronicle had already been published by Riu (1980). Del Valle (1996) has made a few corrections.

The summary of effects set out below is not based on our own original research into this seismic sequence, but on the studies listed above.

The effects of the earthquakes

The earthquakes of greatest intensity occurred in March 1427 (on 13, 14, 15 and 19 of the month), on 22 April (the epicentral area of all these being in the region of Amer), on 15 May (epicentral area in the region of Olot), and on 17 June (epicentral area in the region of Caldes de Malavella); and then the most violent shock of all occurred on 2 February 1428, its epicentral area being in the region of Camprodon, Puigcerdà, and Querolbs.

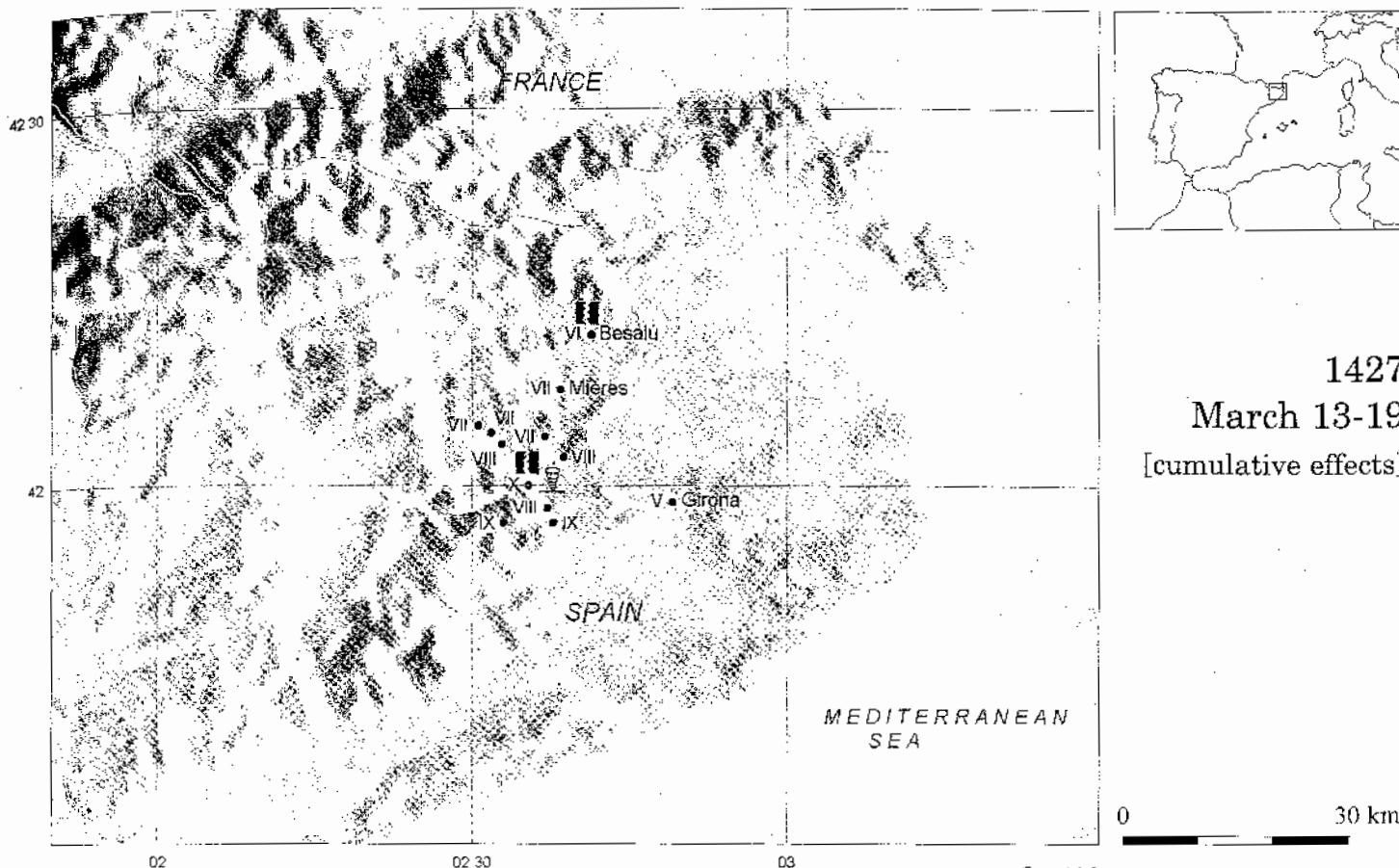
- 1427 March 13-19 Of the March 1427 shocks which struck the region of Amer, the strongest was on 19. Since it is not possible to distinguish accurately the effects of the different shocks occurring between 13 and 19 March, we are inevitably presented with a cumulative picture. At Amer, the Benedictine monastery of St. Maria was largely destroyed, as well as the abbot's palace, the parish church of St. Michael, and a large number of houses in the village. The monks were obliged to abandon their monastery building. There was also serious damage at Sant Martí de Llémèna, Osor, Les Planes d'Hostoles, La Cellera de Ter and Anglès. Somewhat less serious damage occurred at Sant Feliu de Pallerols, Sant Esteve de Llémèna, Mieres, and Castell d'Hostoles; while Besalú suffered slight damage. There was no damage at Barcelona and Girona, or at Pamiers and Montpellier (the latter two towns being in French territory).
- April 22 The earthquake of 22 April 1427 caused damage at the village of Sant Julià del Llor as well as fissures near Lloret Salvatge and was strongly felt at Barcelona and Girona.
- May 15 The strongest earthquake in the 1427 sequence was on 15 May: the church at Olot was almost completely destroyed, and 15 people were killed in a house collapse; there was serious damage at Castellfollit de la Roca, Riudaura, Sant Privat d'en Bas, El Mallo, Santa Pau, Joanetes, Sant Esteve d'en Bas (where the church was almost completely destroyed), and Hostalets d'en Bas.
- June 17 The earthquake of 17 June 1427 struck Caldes de Malavella, where half the town collapsed and 30 houses were destroyed; and it also caused damage at Sant Feliu de Guixó, by the Mediterranean coast.
- 1428 February 2 The earthquake of 2 February 1428 has been studied by Banda and Correig (1984), but it is our opinion that some of the intensities (on the MSK scale) attributed to places affected by the 1427 earthquakes are probably overestimates. The most seriously damaged places were Camprodon, Puigcerdà and Queralbs (IX-X); and then, in descending order of intensity: Arles, Castellfollit de la Roca, Prats de Mollo, Sant Joan de les Abadesses (VIII-IX); La Ral, Nuria (>VIII); Banyoles, Bas, Besalú, Camos, Pic du Canigou, Montagut, Olot, Ripoll, Sant Salvador de Bianya (VIII); Amer, Fontclara, Pruit, Santa Pau, Sant Julià de Vilatorrada, Tona, Vallfogona de Ripollès, Vidrà, Vilanova de Sau (VII-VIII); Barcelona, Castelló d'Empúries, Girona, Olette (VII); Argençola, Clayra, Manlleu, Muntanyola, Santa Eulalia de Puigoriol, Vic (VI-VII); Albi, Cerot, Cervera, Figueres, Perpignan (VI); Tortosa (V-VI); Lleida (V). This is the only case in this catalogue where we have used the intensity estimates provided in Banda and Correig (1984) on the MSK scale.

Environmental effects

- 1427 March 13-19 The earthquakes produced large cracks in the ground near Amer, and near Besalú many animals fell into them. From some of these cracks there were gas emissions which ignited, killing five people close by.
- April 22 These phenomena made a deep impression on local people, and were also observed by the inhabitants of Lloret, as a consequence of the 22 April 1427 earthquake: during the day smoke could be seen pouring out, and flames caused by combustion of gases were visible at night. Water issued from other cracks and flowed into streams, killing the fish.
- June 17 As a consequence of the 17 June 1427 earthquake some springs ceased to flow — at Caldes for example; and from four cracks new springs burst forth with such force that the water reached a height from which it could be seen at a considerable distance. The earthquakes were accompanied by loud subterranean rumblings.

The sources: selection of the most significant texts

Set out below is the text of some of the most significant available sources concerning the 1427-28 seismic sequence in Catalonia; but we make no claim to comprehensiveness. The name *Flosculi* is given to a collection of documents concerning the diocese of Girona which were transcribed towards the mid-16th century by the historian



1427
 March 13-19
 [cumulative effects]

fig. 106

Jerónimo Pujades. The manuscript is in the Bibliothèque Nationale in Paris and has been published by Girbal (1889) and Monsalvatge (1906). The documents dated 8 April 1427 were sent to the Barcelona councillors:

"[...] we have to inform you that these earthquakes have caused severe damage to the town and people of Amer and to its monastery and churches, and the local inhabitants are in despair because they have lost not only their houses and dwellings but also their livelihoods and almost all their personal possessions".

[...] se manifesta la destrucció qui per aquests terratrèmols se es seguida a la vila e pobla de Amer e al monastyr e esgleyes de aquella en gran desolació dels habitants en la dita pobla aqui no solaments son privats de llures cases e habitacions ans han perduts los viures e quax tots los ben mobles.

The documents of 10 April 1427 were sent to the king as well as to numerous prelates and lay officials:

"[...] at the end of last February, earthquakes began in this city [Girona] and its diocese, but they had little effect [...] all the buildings at the said monastery of the monks of the Order of St. Benedict [at Amer] [...] and a church or chapel of St. Michael and all the buildings of the said monastery and in general all the dwellings and other buildings of the inhabitants of that place [...] have completely collapsed in ruins. [...] that the monastery of the black monks of Our Lady St. Maria at Amer, which lies three leagues from that town, has completely collapsed; this being the monastery where already on Saturday 15 March at the eleventh hour of the night, the church collapsed. [...] The destruction at Amer has been much worse than at other places [...]. The fact is that all the houses in the valley and at Osor have collapsed, and at the castle of Anglès and its

Plains and at that of Sant Feliu de Pallerols and at the castle of Hostoles and of Sant Martí de Llèmena and of Sant Steve Celuy and of Mieres, many houses have collapsed as well as almost all the castle of Anglès and many churches in various parishes and many towers and houses which were very strong”.

[...] en la fi del mes de febrer propassat en aquesta ciutat i bisbat comenssaren terratrèmols, empero foren pochos [...] tots los edificis del dit monastir de monjos del Orde de St. Benet [...] e una iglesia o capella de Mossen Sant Miguel e tots los edificis del dit monastir e generalment tots los alberchs e edificis de la pobla del dit lloch [...] son del tot enderrocats e destruits. [...] ca lo monastir de monjos negres de madona Santa Maria de Amer luny de aquesta ciutat per tres lleugues es del tot enderrocats, del qual monastir primerament un dissapte vers les onze hores en la nit a quinze del dit mes de Mars caygue la esglesia. [...] La destrucció de Amer es strade molt pus fort que de altre lloch [...]. Be es ver que totes las cases de la vall e lloch de Osor se son enderrocades e en lo castell de Anglès e en lo lloch de ses Planes e en lo de Sant Feliu de Pallarols e lo castell de Hostoles e Sant Martí de Llemena e Sant Steve Celuy e Myeres, moltes cases e casi tot lo castell de Anglès e moltes isglesies de diverses parroquies e moltes torres e cases que eren molt forts.

The documents of 2 June 1427 were sent to the archbishops of Tarragona:

“Last April, the Lord God allowed the place and parish of Sant Julià del Llor in the Amer valley to be completely destroyed, as it still is, by earthquakes which caused the collapse of the church, houses and dwellings at that place, and that [...] deep chasms have appeared, and water has flowed out of some of them. This caused the death of fish in the Ter stream where that water flows”.

En lo mes de abril prop passat nostre Sr Deu ha permès que lo loch e parrochia de St. Julia de Loret de la vall de Amer es estat e es del tot destròhit per terratremols qui han enderrocades la esglesia, cases e habitacions del dit loch e qui [...] en la dita parroquia se son fetes boques pregons e de algunes de aquelles procehex aygua. Per raho de la qual moren los peixos en lo riu de Ter onde corre la dita aygua.

The documents of 2 August 1427 were sent to the consuls of Perpignan:

“at the town of Olot [...] there was suddenly so powerful and terrible an earthquake that it completely destroyed houses, other buildings and the walls of the town, leaving it totally desolate and abandoned”.

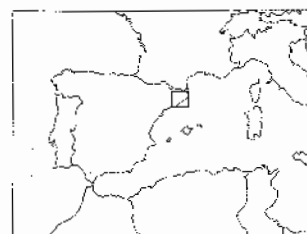
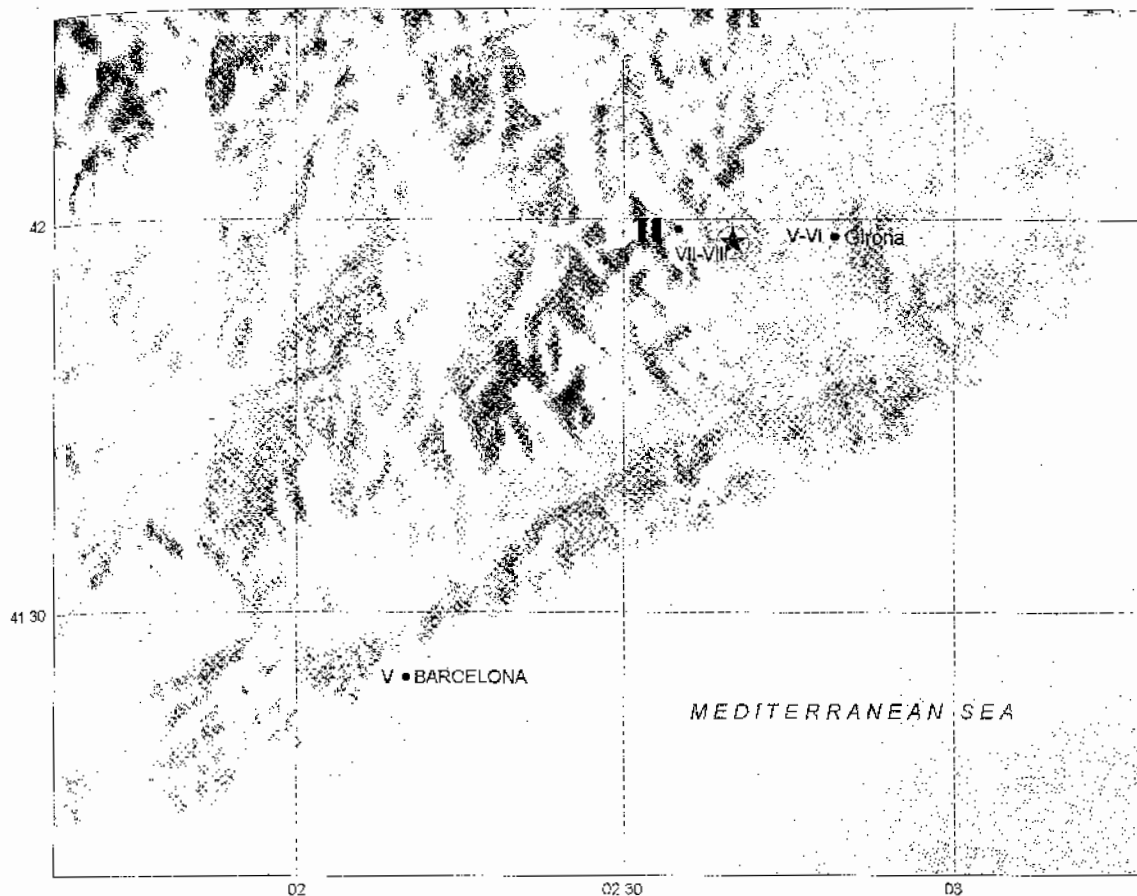
que en la vila de Olot [...] fou fet sobtosament axí fort e terrible terratrèmol que del tot destròhi totes les cases, edificis e los murs de la dita vila, dexantla del tot desolada e deshabitada.

The *Manual de Novells Ardits*, also known as the *Dietari del Antich Consell Barceloni*, is a diary kept by Barcelona Council to record the most important events there.

“Tuesday 22 [April 1427] [...] The night following that day, between the tenth and eleventh hour before midnight, there was a large and frightening earthquake which continued to a lesser degree throughout the night [at Barcelona]”.

Dimarts XXII [...] La nit ques segui apres aquest jorn entre X e XI hores ans de la mige nit fou gran e speventable terratrèmol et continua tota la nit en vegades menors.

At the date 10 February 1428 there is information about the earthquake of 2 February: “Puigcerdà was destroyed and reduced to ruins in that earthquake and three hundred people died there [...] at the town of Ripoll the church ceiling fell in and an important man was killed [...] At the town of Sant Joan de les Abadesses forty people were killed and part of the town collapsed, and at that same time the town of Camprodon suffered almost endless damage in the earthquake [...] At Castellfollit, a place of sixty hearths, eighty people were killed [...] At the town of Olot, which was destroyed last May, eight-



1427
April 22

0 30 km

fig. 107

een people were killed and others injured. At Queralbs, near Camprodon, almost all the inhabitants were killed. At Montagut, near Castellfollit, a lot of people were killed [...] At the town of Castelló d'Empúries, six people were killed in the church [...] at the church of Our Lady S.Maria del Mar [in Barcelona], part of the rose window ["la O"] collapsed and 21 or 22 men, women and children were killed".

[...] Puigcerdá [...] per lo dit terratrèmol fou destruhit e abisat e y moriren trescentes persones [...] En la vila de Ripoll es cayguda la volta de la iglesia e es si mort un prohóm [...] En la vila de Sant Joan sess Abbadesses ha mortes quaranta persones e part de la vila enderrocada, la vila de Camprodon en aquella hora pres infinit dan per lo dit terratrèmol [...] En lo lloch de Castellfollit que es de sexanta fochs a mortes vuitanta persones [...] En la vila de Olot qui en lo mes de Maig prop passat era estada destruhida ha mortes divuit persones e d'altres escalabrades. En lo lloch de Caralbs prop de Camprodon son morts casi tots quants hi habitaven. En lo lloch de Montagut prop de Castellfollit ha morta molta gent [...] En la vila de Castelló de Empuries moriren en la iglesia sis persones [...] en la esgleya de Nostrá Dona Sta. Maria de la Mar caygue certa part de la O. e entre homens, dones et infants moriren hi XXI o XXII.

There is a very detailed description of the effects of the earthquake of 2 February 1428 in Barcelona by Joan Comes in a book first published in 1878 and consisting of information collected in 1583:

"[...] on the feast of the Purification of the Virgin Mary, [2] February [1428], there was a strong earthquake shock at about eight in the morning. And half an hour later, when most people were in their parish churches for the service of blessing wax-lights and candles, there was a very strong, disastrous and very terrible earthquake, the like of

which had never been felt before; and a very unfortunate thing happened at the church of S. Maria del Mar, for it was full of people when the earthquake occurred, many of whom tried to leave by the main door, and [...] the rose window ["la O"] above that door was shaken by the earthquake and various pieces of stone fell down, killing as many as 25 men, women and children, who were struck by the pieces of stone as they went through the door. And some others were suffocated and crushed to death as they rushed to leave, or else fell on top of one another".

[...] en la festa de la purificació de Nostra Dona Santa Maria del mes de febrer, en la qual jornada vers le vuit del matí feu una gran percutida de terratrèmol. E qualque mig hora après estant la major part del poble dins llurs esglésies parroquials per lo ofici de la benedicció dels ciris i de les candeles, se seguí una molt forta e desastrosa e molt terrible percutida de terratrèmol semblant de la qual no era estat sentida, e se seguí cas molt desastrat dins l'església de Madona Santa Maria de la Mar, la qual, com lo predict terratrèmol se seguí, era plena de poble, molts dels quals volgueren eixir pel portal major, e [...] la O la qual era sobre lo dit portal se desvià per lo dit terratrèmol e caigueren-ne diverses perdres e moriren bé 25 persones entre homes dones e infants, los quals en eixint del dit portal foren ferits de les dites pedres, ultra els quals moriren alguns ofegat e premuts com per cuita de eixir se lançasen o caiguessen uns sobre els altres.

Manuscript 3529 in the Österreichische Nationalbibliothek in Vienna contains a report drawn up by a German Carthusian monk from the Erfurt area, which deals with events between 3 March and 23 April 1427. The report has been published in Del Valle (1996): "In the year of Our Lord 1427. 1. Throughout the kingdom of Catalonia, from two days before Ash Wednesday [Monday 3 March] until the Wednesday after Easter [23 April], on which day the Carthusian visitor for the province of Catalonia began his journey to attend the general chapter, there were very bad earthquakes, as a result of which the inhabitants of both states turned to God in terror, making extraordinary and unusual penitence, forgiving each other their offences and making fresh fraternal peace between them, carrying out solemn processions by night and day both inside and outside the city and the settlements, and journeying as far as distant sacred places where indulgences and other spiritual benefits are to be had.

2. During the above period of time, at the village called Amer, near the city of Girona [...] During the procession outside the village, there were very bad earthquakes, so that when [the villagers] returned from the procession, they found the whole abbey and all the village buildings razed to the ground, so that no-one could say "My house was here".

3. A few days later, eighteen or twenty villages or fortified settlements between Barcelona and Girona in the said kingdom were reduced to ruins, as well as the interior and exterior of many castles in these towns. Many dwellings and castles were completely or partly destroyed. The inhabitants of these towns were struck with terror because all houses had to be supported with large beams and timbers.

4. In another large village called Besalù, near the above-mentioned village of Amer, two leagues away in the direction of the kingdom of France, the earth opened and split at several places inside the walls, and 48 large houses were swallowed up in these fissures. It was impossible to find the bottom of these fissures. Outside the village there was a large field sown with corn which was swallowed up and became a pool, and in a circular part of this pool the water was hot, as though in a large saucepan placed on a fire. The men of the village threw a large rope into this circular area in order to find the bottom.

5. During Holy Week [13-19 April] in the village of Amer and in the above-mentioned wood, the earth split open, forming vertical, circular and horizontal fissures, and from time to time animals were found dead there. These fissures were so large that there

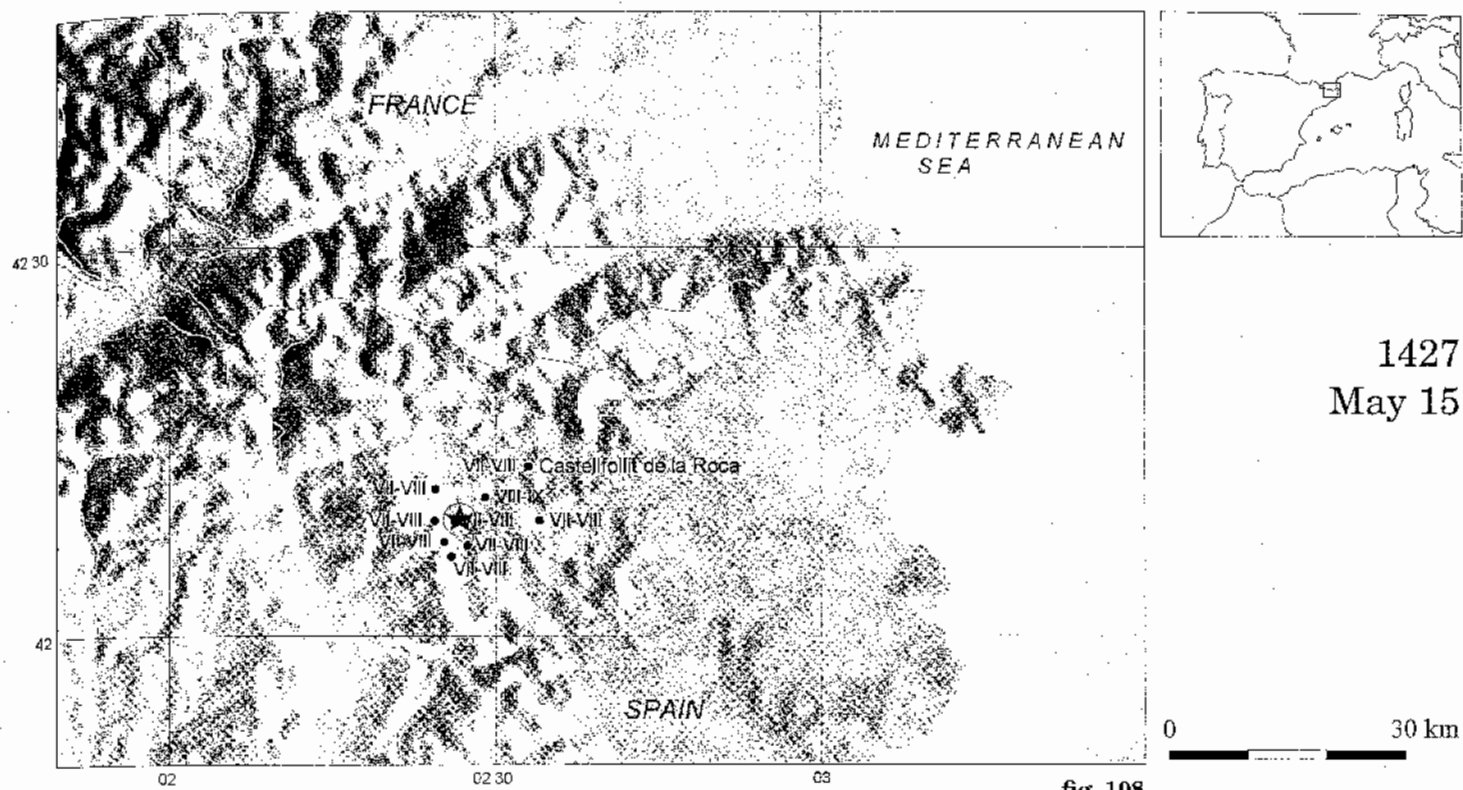


fig. 108

1427
May 15

was room even for a large animal. The bottom of these fissures could not be found. Three large holes appeared in this fissures, from which fire and the smell of burnt sulphur continuously issued. 10 or 12 people approached to see this phenomenon, and five of them died from the smell of sulphur, while the rest barely survived. [...]

8. Earthquakes were and are so frequent at that place that in a single day there have occurred and do occur five, seven, or ten and frequently twenty of them. They also say that very bad earthquakes occur in the great kingdom of Spain, causing the destruction of many villages and fortified settlements. [...]

Anno Domini MCCCCXXVII 1. In toto regno Cathalonie a die secunda ante carnisprenium usque ad feriam quartam infra octavam pasche qua visitator provincie Cathalonie ordinis carthusiensis iter arripuit ad capitulum generale fuerunt gravissimi terremotus pretextu quorum gentes utriusque status territe fuerunt converse ad dominum penitentiam mirabilem et insolitam facientes iniuriam ad invicem remittentes pacem inter se fraternaliter reformantes, processiones sollempnes die noctuque tam intus quam extra civitates et opida ad loca devotissima et remota ubi sunt indulgentie et alia beneficia spiritualia accedentes.

2. In pendulo temporis prescripti in villa vocata Amer, prope civitatem Gerunde, [...] Durante processione extra villam invaluerunt gravissimi terremotus, taliter quod regressi de processione reppererunt totam abbatiam et omnia edificia dicte ville penitus ad terram prostrata, ita quod non fuit qui diceret: "Ilic fuit domus mea".

3. Post paucos dies infra civitates Barchinone et Gerunde dicti regni corruerunt xviii vel xx villagia sive opida bona et quam plurima castra etiam in dictis civitatibus tam intus quam extra. Multa hospitia et castra, quedam in partem, quedam in totum, funditus corruerunt. In dictis civitatibus magno terrore percussis fuerunt quia omnia hospitia magnis trabibus et lignis sustentata.

4. In alia villa magna vocata Besolu, prope dictam villam Amer, ad duas leucas versus regnum Francie infra murorum ambitum, fuit terra aperta et scissa in pluribus locis,

infra quas aperturas xlviij magna hospicia fuerunt subversa seu in abbisum submersa, in quibus scissuris fundus minime reperitur.

Extra istam villam fuit magnus campus tritico seminatus penitus submissus et factus est stagnum aquarum et in quadam parte stagni per rotundam circumferentiam sunt ibi aque ferventes ac si essent in magno tatulo igne supposito. In qua circumferentia homines dicte ville submittentes abolidem, id est cordam magnam, fundum minime reppererunt.

5. *In ebdomada sancta inter villam de Amer et nemus predictum fuit terra aperta et scissa per longum et rotundum et per transversum et quotquot ibi fuerunt reperta animalia penitus obierunt. Sunt adeo ille scissure magne quod una magna bestia per ipsas intraret. In ipsis scissuris fundus non reperitur. Infra ambitum dictarum scissurarum fuerunt aperta tria magna foramina in quibus continue emanat ignis et fetor sulphuris ardentis. Ad hoc videndum accesserunt x vel xii persone ex quibus pro fetore illius sulphuris quinque fuerunt mortue, restantes semivive relicte sunt. [...]*

8. *Ibidem fuerunt et sunt tam frequentes terremotus quod infra diem naturalem viguerunt et viguent quinquies, septies, decies et frequenter vigesies.*

Fertur etiam quod in regno magno Hispanie sunt gravissimi terremotus propter quos multe ville et opida corruerunt. [...]

In manuscript Mar F 256 in the Public Library at Danzig in Poland, there is a report drawn up by the prior of the monastery of the Valley of Jesus Christ, who was also visitor general of his order in the kingdom of Catalonia. This report has also been published in Del Valle (1996):

"1. Note that the prior of the Carthusian monastery of the Valley of Jesus Christ in the kingdom of Catalonia assured the chapter of the order that what he had to say was true: First of all, that an earthquake began in the said kingdom on the Friday before "Esto mihi in Deum" Sunday [Friday 28 February 1427 and Sunday 2 March] or shortly before that, until the said prior left the kingdom, which happened, so I believe, before the feast of Easter [20 April]. And the prior was uncertain whether the earthquake came to an end on the fourth Sunday after that feast [18 May] or not, and he told that a similar earthquake had already occurred at Montpellier, or so he said.

2. Secondly, he said that this earthquake caused the collapse and destruction of eighteen or twenty towns and fortified settlements surrounded by walls, as well as fortified castles and villages, he knew not how many. And some say that even Barcelona, one of the largest cities in Catalonia, was completely destroyed. Others say that many large buildings there were reduced to ruins when the earth shook.

3. Thirdly, he tells that one settlement was entirely swallowed up by the earth, and subsequently where the settlement had been there appeared a (lake) of such deep water that the fishermen could not reach its bottom with their lead weights.

4. Fourthly, he said that at many places in the said kingdom large fissures appeared, out of which came flames and the smell of sulphur.

5. Fifthly, he tells that a certain abbot who had a considerable settlement around his monastery, and who wished to placate God so that there would be no earthquake there, ordered his people to fast and pray and make processions with relics. [There follows a description of devotional rites and extraordinary events.]

6. He also tells of many other terrible happenings which caused a great many Christians in those places to be thrown into great anxiety and tribulation. And men and women fled from their homes with their children, some of whom were even naked, for fear of being struck and terrified by the earthquake. So we must pray for these people in their trials and tribulations, asking for Christ's charity".

1. Nota quidem prior monasterii Vallis Iehsu Christi in Kathalonie regno, ordinis carthusiensis, pro certo narrat in capitulo dicti ordinis:

Primo, quod in dicto regno terremotus incepit sexta feria ante dominicam Esto mihi (in Deum) vel parum ante et durat usque ad exitum dicti prioris de eodem regno qui fuit ut

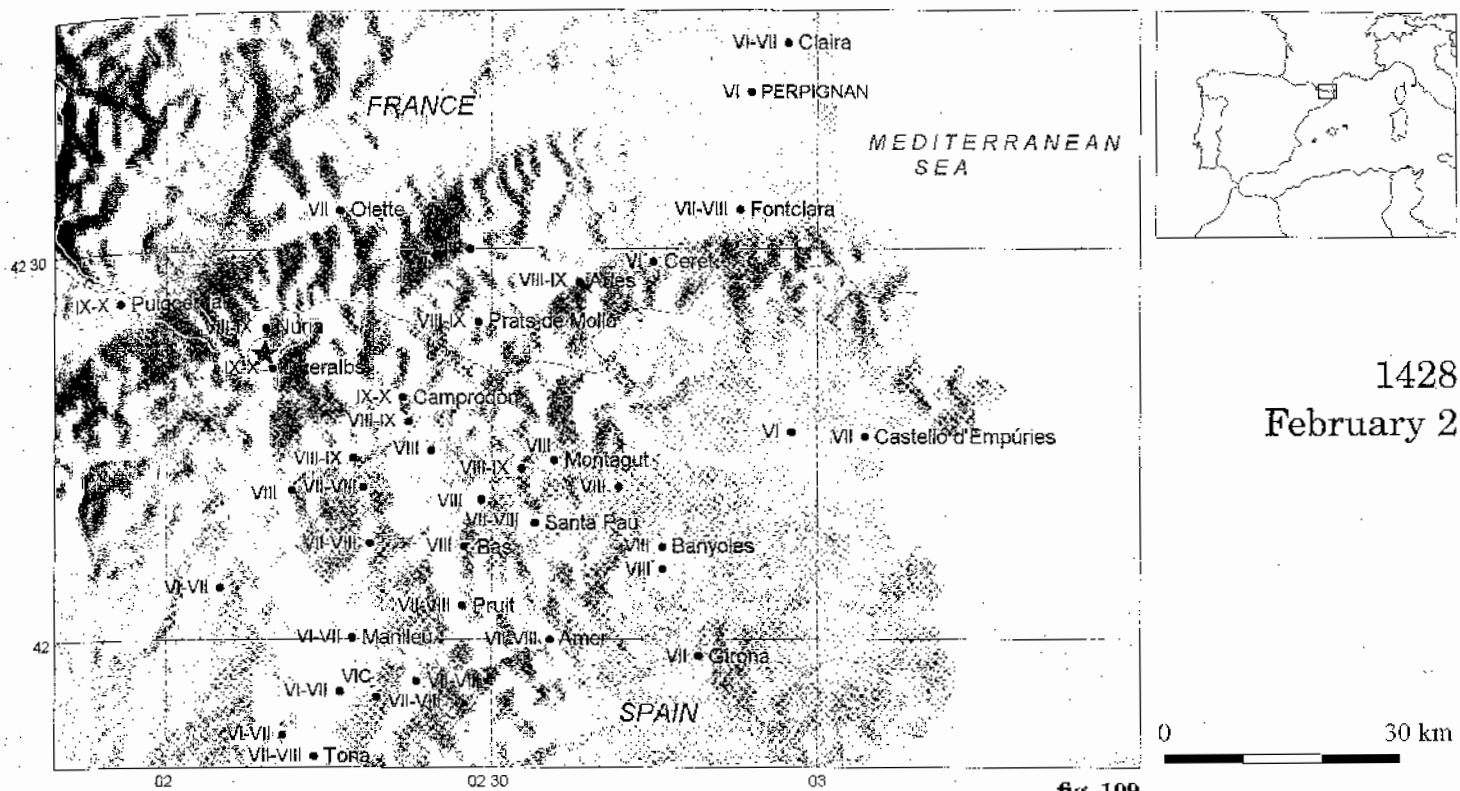


fig. 109

estimo prius festum Pasche. Et fuit dubius dictus prior dominica quarta postque dictum festum an cessaverit tunc terremotus vel non, et dixit huiusmodi terremotum iam venisse ad Montempesolanum uti dumtaxat dicta excepta.

2. *Secundo, narrat quod quibusmodi terremotu ceciderunt et ruerunt XVIII vel XX civitates et oppida murata, praeter castra et villas quarum numerum ignoravit. Et aliqui dicunt Parsinsonam, que est una de maioribus civitatibus in Kathalonia, etiam funditus esse distructam. Alii dicunt quod multa edeficia magna in ipsa ruerunt quando terre trucissata.*

3. *Tertio, narrat quod unum opidum ex toto a terra fuit absortum et postea in loco oppidi apparuit aqua profundissima, cuius fundum piscatores cum suo plumbo non potuerunt tangere.*

4. *Quarto, narravit quod in dicto regno in multis locis apparent magne scissure, exeunt flamme ignee et odor sulfureus.*

5. *Quinto, narrat quod quidam abbas habuit circa monasterium suum unum satis notabile oppidum qui volens placare Deum ne veniret terremotus ad locum suum iniunxit populo suo jeiunia, orationes et processiones cum reliquiis facere. [...]*

6. *Item multa alia terribilia narrat propter que ibidem quamplures christianos constitutos esse in magnis angustiis et tribulacionibus et timoribus. Et fugiunt cum parvulis suis aliqui etiam nudi, homines et mulieres de habitacionibus suis, terremotus timore perculti vel perterriti. Quare merito predictis tribulatis in caritate Christi compaciendo debemus orare.*

We now transcribe the most significant passages from the chronicle in letter form, written — very probably in June 1427 — by an anonymous Jew who lived at Girona. A critical edition of this text was published by Del Valle (1996), with a Spanish translation, the Hebrew text, and a reproduction of the original manuscript. The editor notes that according to the writer, the earthquake began on Thursday 26 February 1427, and that there was a new moon on the previous day, Wednesday 25 February. In actual fact, 26 February 1427 was a Wednesday, not a Thursday, and the first day of Adar II

was Friday 28 February. Consequently, if the first earthquake came after the appearance of the new moon, it must have occurred on 28 February. The text is as follows: "Letter sent from Girona about the earthquake in the year (5)187 [1427] since the Creation.

1. He *who shakes the earth out of her place* (Job 9, 6) moved and twisted the earth on Thursday, the first day of the month of Adar II, in the year 5187 since the Creation, on 26 February (1)427. The previous day, Wednesday, there was a new moon. At midday in the week of *el.le pequidé* [2-8 March] [...] *the earth shook* (Isaiah 24, 19). [...]

2. *The earth shook and trembled* (2 Samuel 22, 8) on Thursday, during the night, three hours before midnight. Noises like the bellowing of bulls could be heard without cease during the day. [...]

3. *The earth was rent* (1 Kings 1, 40) on a mountain near the place called Peralada. A crack appeared, one cubit wide and five cubits long. On another mountain, near the church of St. Barbara, another crack appeared, near the town of Amer [...]. Seventy or eighty families lived there. The earth was like a paradise before (the catastrophe) and like a *desolate wilderness* (Jeremiah 12, 10) afterwards. [...] Not a single hut more than four cubits high remained standing. But there were no victims amongst the men, women and children, because they all fled at the noise of the earthquake. They took up residence in tents in the fields and vineyards.

4. The whole monastery of Abad [the Benedictine abbey at Amer] *bowed, fell and collapsed in ruins* (Judges 5, 27). In all the local villages, one of which is Anglès, seventy houses collapsed, as well as the whole of La Cellerà. Half the bridge collapsed. At the town of Osor *terrible things happened* (Jeremiah 5, 30). Not a single house remained of the fifty (there) and in the many villages round about. In San Martí de Llémena many (formerly) large and luxurious houses were reduced to ruins [...].

5. In the town of Girona, only a few managed *to go into the clefts in the rocks and into the recesses of the rocks* (Isaiah 2, 21), in order to set up tents and shacks in the fields and on the banks of streams [...]. Great terror took hold in the city of Montpellier and throughout the area surrounding Perpignan as far as Tortosa and up to the river La Cénia, on the road to Valencia. But it did not reach the kingdom of Valencia.

8. When the earthquake occurred, springs of water gushed forth in our region. Others became blocked, as did the thermal water baths in the village of Caldes. Other new ones sprang up in the fields, vineyards and roads. [...]

10. For as long a time as this, on 12 April (1)427, a special Sunday for all Gentiles, being the second day of the Egyptian Easter [in reality 13 April], the earth shook violently twenty-five times, hour after hour, moment after moment, after the earth had been quiet. But she was not allowed (rest), for not a day of the forty passed without her shaking, though not (excessively). [...]

11. After these events, on the night of Tuesday, 23 April (1)427, two hours before midnight, there was a dreadful and very powerful shock, such as we had never experienced before. Two cracks appeared on a mountain near the town of Mer, at a place called Lloret. A column of smoke came out of one crack. Out of another came *coals of fire with flames* (Song of Songs 8, 6) and *a stink came out and a foul smell arose* (Joel 2, 20) to the extent that two women died from the smell when they approached the crack, and five men collapsed as though they were dead. [...] *All those who approached the mountain were inevitably killed* (Exodus 19, 12). After which the earth rested for three days. [...]

13. On that day, Thursday 14 of (May) in 1427 *peoples cried out and kingdoms were moved* (Psalms 46, 6), *the hills trembled* (Isaiah 5, 25), there was a great snowstorm and an enormous (earth) shock, such as there had never been before nor will ever be again, to the extent that *the desert pastures* (Jeremiah 9, 10) were reduced to ruins, and the towns of Olot, Castelfollit, Santa Pau Mallol, Sant Esteve, Salvatge and Lloret were destroyed. *The earth was cleft* (Habakkuk 3, 9) on the mountain of Lloret, near the town of Mer. Fifty cracks appeared; from four of them jets of water came forth like tall columns, each rising

- up as much as fifty cubits. From a distance, they appeared to the eye like a great tower.
14. At the town of Olot, five men died when a house collapsed on top of them. [...] All the towers fell down and all the palaces collapsed.
15. From that day onwards, (the shaking) *never held its peace day or night* (Isaiah 62, 6) until today, 4 June (1)427. [...].
16. On the peaks of the mountains, as on the mountain of Sant Julià de Ramis, springs died down on the tops of the mountains. On that day, Sunday 8 June (1)427, the earth shook again with a great and extraordinary shock, with the result that people were frightened. But it became a little calmer for four days. *The earth was at rest and was quiet. They (its inhabitants) broke forth into cries of joy* (Isaiah 14, 7) [...].
17. It happened on this day, Thursday 12 June 1427, [...] Fifty shocks in a single day! [...].
19. At the city of Girona, the walls shook a hundred times at fifty different moments [...].
21. For three days *the heaven was black with clouds* (1 Kings 18, 45). *The earth shook* (Psalms 77, 18) terribly. Now, today, there is a limpid sky, as clear as snow, as pure as milk. But the shaking (of the earth) has been very strong. Half the town of Caldes has been destroyed, and thirty of its houses have collapsed. At a crossroads on the way to Villadonna, cracks and springs have appeared [...].
23. We did not feel nor did we see that on account of the earthquake the earth broke open and the water which sprang from the cracks flowed into our rivers, *killing their fish* (Psalms 105, 29). *A stink came out and a foul smell arose* (Joel 2, 20) as far as places three leagues away. For here in our city of Girona, on more than one day, when the wind blew from the west, there was a smell [...] a sickening (odour). [...].
24. This is the chronicle of the great earthquake which occurred in this region in these days, in this year, up to today, 18 June (1)427, exactly as things happened. [...].

▲
1427 03 13-19 cumulative effects Sites: 15 EE: 2

localities	lat.	long.	I	localities	lat.	long.	I
Amer E	42 00	02 35	X EE	S.Esteve d. Llémèna E	42 04	02 37	VII
Angles E	41 57	02 38	IX	S.Feliu de Pallerols E	42 05	02 31	VII
Osor E	41 57	02 33	IX	Besalú E	42 12	02 42	VI EE
La Cellera de Ter E	41 58	02 37	VIII	Barcelona E	41 25	02 10	V
Les Planes d'Hostol. E	42 03	02 33	VIII	Girona E	41 59	02 49	V
S.Martí de Llémèna E	42 02	02 39	VIII	Montpellier E	43 37	03 52	F
Castell d'Hostoles E	42 04	02 32	VII	Pamiers E	43 07	01 36	F
Mieres E	42 08	02 38	VII				

1427 04 22 22:00 UT ☉ = 41 58 02 40 I₀ = VI-VII Me = 5.3 Sites: 3 EE: 1

localities	lat.	long.	I	localities	lat.	long.	I
Sant Julià del Llor	41 58	02 40	VII-VIII	Barcelona	41 25	02 10	V
Girona	41 59	02 49	V-VI	Lloret Salvatge	41 59	02 36	EE

1427 05 15 ☉ = 42 09 02 27 I₀ = VII-VIII Me = 5.4 Sites: 9

localities	lat.	long.	I	localities	lat.	long.	I
Olot	42 11	02 29	VIII-IX	Riudaura	42 11	02 24	VII-VIII
Castellfolit de la Roca	42 13	02 33	VII-VIII	Santa Pau	42 09	02 34	VII-VIII
El Mallol	42 09	02 26	VII-VIII	Sant Esteve d'en Bas	42 07	02 27	VII-VIII
Hostalets d'en Bas	42 06	02 26	VII-VIII	Sant Privat d'en Bas	42 09	02 24	VII-VIII
Joanetes	42 07	02 25	VII-VIII				

1427 06 17

localities	lat.	long.	I	localities	lat.	long.	I
Caldes de Malavella	41 50	02 48	IX EE	Sant Feliu de Guixó	41 47	03 02	VII-VIII

1428 02 02 8:00 UT ★ = 42 22 02 09 I₀ = IX-X Me = 6.7 Sites: 44

localities	lat.	long.	I	localities	lat.	long.	I
Camprodon E	42 19	02 22	IX-X	S.Julià de Vilatorca E	41 56	02 19	VII-VIII
Puigcerdà E	42 26	01 56	IX-X	Tona E	41 51	02 14	VII-VIII
Queralbs E	42 21	02 10	IX-X	Vallfogona d.Rippol. E	42 12	02 18	VII-VIII
Aries F	42 27	02 38	VIII-IX	Vidrà E	42 07	02 19	VII-VIII
Castellfollit d. Roca E	42 13	02 33	VIII-IX	Vilanova de Sau E	41 57	02 23	VII-VIII
La Ral	42 17	02 22	VIII-IX	Barcelona E	41 25	02 10	VII
Nuria E	42 24	02 09	VIII-IX	Castelló d'Empúries E	42 16	03 04	VII
Prats de Mollo F	42 24	02 29	VIII-IX	Girona E	41 59	02 49	VII
Sant Joan de les A. E	42 14	02 17	VIII-IX	Olette F	42 33	02 16	VII
Banyoles E	42 07	02 46	VIII	Argençola E	41 34	01 27	VI-VII
Bas E	42 07	02 27	VIII	Clayra F	42 46	02 57	VI-VII
Besalú E	42 12	02 42	VIII	Manlleu E	42 00	02 17	VI-VII
Camós E	42 05	02 46	VIII	Muntanyola E	41 53	02 11	VI-VII
Montagut E	42 14	02 36	VIII	S.Eulalia de Puig. E	42 04	02 05	VI-VII
Olot E	42 11	02 29	VIII	Vic E	41 56	02 15	VI-VII
Pic du Canigou F	42 30	02 28	VIII	Albi F	43 56	02 08	VI
Ripoll E	42 11	02 12	VIII	Ceret F	42 29	02 45	VI
S.Salvador de Bian. E	42 15	02 24	VIII	Cervera E	41 40	01 17	VI
Amer E	42 00	02 35	VII-VIII	Figueres E	42 16	02 58	VI
Fontclara F	42 33	02 53	VII-VIII	Perpignan F	42 42	02 54	VI
Pruít E	42 03	02 27	VII-VIII	Tortosa E	40 49	00 31	V-VI
Santa Pau E	42 09	02 34	VII-VIII	Lleida E	41 37	00 37	V

< 287 > 1428 May Eastern Peloponnese [Greece]

sources BNMarciava, *Mss. It.*, VII, 2049 (8332/1-2), Morosini, *Cronaca*, II, fol.888

This earthquake is unknown to the seismic tradition catalogues.

On an unspecified day in May 1428, Modone (present-day Methoni) and Corone (now Koroni) were struck by earthquakes which the source describe as "very great". Many buildings were badly damaged, and there were many victims.

Information about it can be found in the manuscript *Cronaca* in old Venetian by Antonio Morosini, a contemporary writer. Morosini got his information from news which reached Venice on 28 May 1428.

He writes:

"Then letters from many places gave us the news, brought by ships with Candia cheese, that there had been such very great earthquakes at Modone and Corone that many buildings and beautiful apartments had been reduced to ruins in Modone and Corone, and there were many victims [...]. There were amazing other signs in the Morea, God be thanked for everything".

E apreso avese mo, fose scrito per molte parte, abude per lo zionzer dele nave vegnude con i formai de Candia, abude da Modon e Coron, grandissimi taramoti aver parso per muodo eser roinado de molti palaxii e bele stancie in Modon e Coron con peramento di molte aneme, perido de molte criature, meraveioxi segni stadi ancor per la Morea; Dio in tuto ne sia regraciado.

▲ 1428 05 -

localities	lat.	long.	I	localities	lat.	long.	I
Koroni	36 47	21 56	VIII-IX	Methoni	36 49	21 42	VIII-IX

(288) 1429 November 10 Messina [Sicily, Italy]

source Notula in Lampros (1922, p.410)
catalogue d. Evangelatou-Notara (1993)

On 10 November 1429, at about 16:20 UT (the twenty-fourth hour, "Italian time") an earthquake described as "great and dreadful" struck Messina, in north-eastern island of Sicily. A merlon fell — probably from the church of S.Salvatore, since that is where the manuscript was written.

This earthquake is referred to in Lampros (1922, p.410) and recorded in Evangelatou-Notara (1993, pp.101-2), but was not previously known to seismological studies.

The source is a *Notula* in manuscript 103 in Messina Biblioteca Universitaria, formerly belonging to the church of S.Salvatore. At fol.25r., we read:

"1429, 10 November, at the twenty-fourth hour, there was a great and dreadful earthquake, and a merlon fell from this church, in the second indiction".

ἀνκθ' μηνι νοεμβρίῳ τ' εἰς κδ' ὥρας ἐγένετο σισμὸς μέγας καὶ φοβερός καὶ ἀπὸ ταύτης ἐκκλησίας ἔπεσεν ἓνα μέρλος ἰνδ. β'.

▲ 1429 11 10

localities	lat.	long.	I
Messina	38 11	15 33	D (VI-VII)

(289) 1430 March 26 Thessaloniki [Greece]

source Anagnostes, *Diegesis*, pp.492-3
catalogues d. Schmidt (1881); Galanopoulos (1955); Grumel (1958); Galanopoulos (1961); Galanopoulos (1981); Evangelatou-Notara (1993); *Papazachos and Papazachou (1997)
catalogues p. Shebalin *et al.* (1974)

Towards midnight on 26 March 1430, an earthquake, which the source describes as "great", created terror amongst the inhabitants of Thessaloniki.

Information about this earthquake can be found in the *Diegesis* of John Anagnostes on the siege of Thessaloniki by the Ottomans, of which he was an eye-witness. He records that while the Venetians were preparing to defend themselves against sultan Murad II (1421-51):

"[...] towards midnight, there was a great earthquake in the city, which struck terror into the minds of all. And indeed no-one thought it a good sign: in fact, the earthquakes which had shaken the city for a long time led men to think that they foretold upheavals, bringing an evil horde to the city [there follows a description of the city's capture]".

[...] περί μέσας νύκτας σεισμὸς [καὶ] τῆ πόλει γίνεται μέγας καὶ φόβον ταῖς ἀπάντων ἐνήκε ψυχαῖς, τεκμηρίον τε τοῦτο οὐκ ἀγαθὸν ἠγήσαντο πάντες πραγμάτων· οὕτω γὰρ οἱ πρὸ μακροῦ τὴν πόλιν ἐκείνοι συνέσειον σεισμοὶ παρεσκευάσαν τοὺς ἀνθρώπους, καὶ τοιαύτην ἔδωκαν ὑπόληψιν ἔχειν, ἀνωμαλίας πραγμάτων κάκεινοι προηγγελκότες καὶ δεινῶν ἔσμον ἐπαγαγόντες τῆ πόλει.

Schmidt (1881, p.157) and Papazachos and Papazachou (1997, p.196) date the earthquake to 26 February 1430. The latter two authors do not give the earthquake an intensity value, and they estimate its magnitude as <6.0.

▲ 1430 03 26 at midnight

localities	lat.	long.	I
Thessaloniki	40 38	22 56	V-VI?

> fissures <

- sources al-Maqrizi, *al-Suluk*, IV, 2, p.856; Ibn Hajar, *Inba'*, III, pp.457-8
 literature Taher (1979)
 catalogues d. Perrey (1847); Taramelli and Mercalli (1886)
 catalogues p. Poirier and Taher (1980) Martínez Solares and Mezcu Rodríguez (2002)

On 24 April 1431, after midday, a destructive earthquake struck Andalusia and the Darma and Utrera regions of southern Spain. In Granada, half the citadel collapsed, the principal mosque was seriously damaged, and its minaret collapsed. In many unspecified places, chasms opened up and swallowed villages. The shocks lasted for 45 days; and for fear of collapses the people of Granada abandoned the city, taking refuge in tents in the countryside. The dramatic background to this event is the reconquest of southern Spain from the Arabs.

Information about the earthquake can be found in the works of two contemporary Arab historians: al-Maqrizi and Ibn Hajar. Al-Maqrizi provides the more detailed description:

"On 11 [*Sha'ban*], after the hour of midday prayer, there was a violent earthquake in Andalusia, in the Granata countryside — ruled over by the Hamdanids — in the region of Utrera and Darma. The ground was swallowed up with all the inhabitants, cattle and everything that stood upon it, so that anyone passing that way would have wondered what had happened to all the villages that used to be there. Many other places were swallowed up. Half the citadel of Granata collapsed; the principal mosque was severely damaged, and its minaret collapsed. The mosque was seen to rise up twice to a height of about ten cubits and then fall back again. One panic-stricken man picked up his son and made to go out of his house door, but the arch of the door collapsed and imprisoned him. The ground continued to shake for forty-five days, with the result that people went out into the countryside and camped in tents, for fear that the city would collapse on top of them. All this happened after the arrival of the sovereign of Tunis, the mad Abu 'Abdallah Muhammad al-Aysar, who laid siege to the citadel of Granata for seven months, and was killed by the men of his own exhausted and impoverished army. News [of the siege's failure] reached king Alphonso of Castile, who assembled his Frankish army and set sail for Cordoba with the intention of proceeding from there to Granata and wresting it from the Musulmans. But a series of misfortunes occurred, involving a lack of money, the defeat of the army, and deaths in the earthquake".

في حادي عشرة (شعبان) كانت زلزلة عظيمة شديدة بعد صلاة الظهر بجزيرة الأندلس وبميرج أغرناطة وهي بلد همدان وبلد أوطررة وبلد دارما فابتلعت الأرض هذه البلاد بأناسها وبقرها وغنمها وسائر ما فيها حتى صار من يمر حولها يقول كان هنا بلد كذا وبلد كذا وانخسف في كثير من البلاد عدة مواضع وسقط نصف قلعة أغرناطة وتهدم كثير من الجامع الأعظم وسقط أعلا منارته ورؤى الجامع يرتفع ثم يرجع ومقدار ارتفاعه نحو عشرة أذرع وارتفع كذلك مرتين وخاف رجل عند حدوث الزلزلة فأخذ ابنه وأراد أن يخرج من باب داره فالتصق جانباً الباب إلى جانبها قبل الزلزلة وأقامت الأرض بعد ذلك نحو خمس وأربعين يوماً تهتز حتى خرج الناس إلى الصحراء ونزلوا في الخيم خوفاً من المدينة أن تسقط مبانها عليهم وكان هذا كله بعد وصول السلطان المخلوع ابن عبد الملك محمد الأيسر من تونس إلى الأندلس وحصره قلعة أغرناطة سبعة أشهر وقتله الأجناد والرجال حتى فنيت العدد والأموال فبلغ ذلك ملك قشتالة ألفنسي فجمع عساكره من الفرنج وركب البحر إلى قرطبة يريد أخذ أغرناطة من المسلمين فاشتد البلاء عليهم لقلعة المال بأغرناطة وفناء عسكرها في الفتنة وموت من هلك في الزلزلة.

Ibn Hajar simply records the effects of the earthquake at the city of Granada:

"In the month of *Sha'ban*, there was an earthquake at Granata. Many places were swallowed up, and part of the citadel was damaged. The earth shook day after day.

causing the walls of the principal mosque to collapse. The people fled into the countryside in terror."

في شعبان كانت الزلزاله في غرناطة وخسف بعدة أماكن وعدة مواضع وانهدم بعض القلعة ودامت الأرض تهتز أياما وسقط من جدار الجامع الأعظم وخاف أهل البلد كلهم فخرجوا إلى الصحراء.

Poirier and Taher (1980) date the earthquake to 25 April, and give a tentative intensity of between grade IX and X MM at Granada.

▲ 1431 04 24 at midday Sites: 3

localities	lat.	long.	I	localities	lat.	long.	I
■ Darma area	—	—	IX-X	Granada	37 10	-03 35	VIII
■ Utrera area	37 11	-05 47	IX-X				

{ 291 } **1433 May 4 Bologna area [northern Italy]**

- sources 1 [manuscripts] BUBo, *Mss.*, 1409, *Istoria*, fol.54v; *Mss.*, 81, no.6, Bologn. Marc., *Cron.*, fol.49; *Mss.*, 583, *Istoria*, fol.63r; BNCFlorence, Magliabechiano, VIII, 1488, *Ricordi*, fol.96r. Flocchi, *Chron.*, p.57; Albertucci de' Bors., *Cron.*, p.81; *Cron. Varign.*, IV, p.63
- sources 2 BUBo, *Mss.*, 429, Cattani, *Cron.*, fol.47v; *Mss.*, 294, Bianchini, *Cron.*, fol.66v; *Mss.*, 1439, Delle Tuato, *Hist.*, II, fol.273v; BCABo, *Mss.*, B.2355, Bianchetti, *Cron.*, fol.462; BCSaffiForlì, *Racc. Piancastelli*, O.IV.18, *Cron.*, fol.495; Ghirardacci, *Della hist.*, pp.33-4
- historiography Sigonio (1586); Faleoni (1649); BUBo, 770, Ghiselli, *Mem.*, 18th c.; Muzzi (1840-46); Guidicini (1872); Quaquarelli (1993)
- literature Camassi and Molin (1994); Guidoboni (1997); Guidoboni and Ciuccarelli (2003a)
- catalogues d. Perrey (1848); Mallet (1853); Guarini (1880); Mercalli (1883); Baratta (1901); Milne (1911); Guidi (1915); *Boschi *et al.* (1997, 2000)
- catalogues p. Giorgetti and Iaccarino (1971); Carrozzo *et al.* (1973); Postpischl (1985); CPTI (1999)

On 4 May 1433, shortly before 8:05 UT (before the thirteenth hour, "Italian time"), a strong earthquake struck Bologna. Contemporary sources describe it as a "great" earthquake. Slightly later sources (second half of the 15th and 16th centuries) record serious damage to city buildings, without going into details. The earthquake was felt over a fairly wide area, including Forlì, where it was noticed by the inhabitants, Florence, where it was of moderate intensity, and Lucca.

In relation to Bologna, three sources report that it was "great", without indicating specific effects. In the *Cronaca Varignana* we read:

"1433. - There was a great earthquake in the city of Bologna on 4 May, in the morning".

1433. - *In la città de Bologna fuo grande tremoto adì iiii.o del mese de mazo, la matina.*

In the manuscript *Istoria di Bologna dall'Anno Di Nostro Signore 1260 fino al 1453* (Biblioteca Universitaria, Bologna, 1409) we find:

"There were great earthquakes in the city of Bologna on 4 May in the morning".

In la zità de Bologna si fo gran taramotti adì 4 de mazo 1433 la matina.

In the *Cronaca di Bologna* (700-1513; Biblioteca Universitaria, Bologna, 294), attributed to Marco Antonio Bianchini, though in fact he was simply the owner of the manuscript codex, we find:

"On 4 May in the morning there were great earthquakes in Bologna.

A di 4 de mazo la matina fu gran teramoti in Bologna.

The last two of the above works belong respectively to the first and second families of

manuscripts which go to form what is known as the Bolognetti *Cronaca della città di Bologna* (423-1454). This is the collective name given to a number of different manuscripts which may be copies of a single work, probably by more than one hand. Textual scholars are still seeking to establish the links between the various copies which, in our present state of knowledge, are subdivided into two principal "families" (Quaquarelli 1993). The chronicle by the Dominican preacher Girolamo Albertucci de' Borselli, who lived between 1432 and 1497, suggests more serious effects than the above sources: "The year of Our Lord 1433. [...] There were great earthquakes in Bologna which brought down many buildings".

Anno Domini 1433. [...] Magni terremotus Bononie fuere qui multa hedifitia deiecerunt.

Immediately after this, the author writes of a thunderbolt which damaged the Asinelli tower. The earthquake and thunderbolt are also mentioned in the third part of the *Della historia di Bologna* by the Augustinian monk Cherubino Ghirardacci, a reliable 16th century scholar and historian from Bologna, who probably used sources which are now lost: "On 4 May [1433], a Monday, there are great earthquakes at Bologna. And at this time a thunderbolt falls from the sky, strikes various places, and damages the Asinelli tower. And the earth shook so much that many buildings collapsed".

Alli 4 di maggio, il lunedì, sono grandissimi terremoti in Bologna. Et in questo tempo una saetta casca dal cielo et in più parti percuote et fracassa la torre degl'Asinelli; et tremò talmente la terra che molti edificij rovinorono.

The earthquake is reported to have been felt at Forlì in the reliable *Chronicon* by Girolamo Fiocchi, a Dominican friar who died soon after 1433:

"In the same year [1433], on 4 May, a Monday, the feast of the Crowning with Thorns, before the hour of dinner, there was an earthquake, and while it was not strong, it nevertheless caused people to be amazed. May God direct it to a good and peaceful end".

Eodem anno, 4 die madii, die lune, in festo corone Domini, ante horam prandii, fuit terremotus, et si non magnus, tamen non sine admiratione personarum; quem Deus in bonum et pacem convertat.

4 May was indeed a Monday in 1433, and it was the feast of the Crowning with Thorns. The same items of information are to be found in the *Cronaca Albertina*, a text consisting of a miscellany of 14th-16th century chronicles which were collected together in 1720 and are preserved in 19th century copies (Biblioteca Comunale Saffi, Forlì, Piancastelli, O.IV.18). The earthquake is also recorded in sources from Tuscany: there is an anonymous manuscript (Biblioteca Nazionale, Florence, *Magliabechiano*, VIII, 1488), compiled in the 15th century by an author who lived partly in Florence and partly in Pisa, in which we read:

"On 4 May 1433 in the morning at about the thirteenth hour, there was an earthquake of moderate intensity".

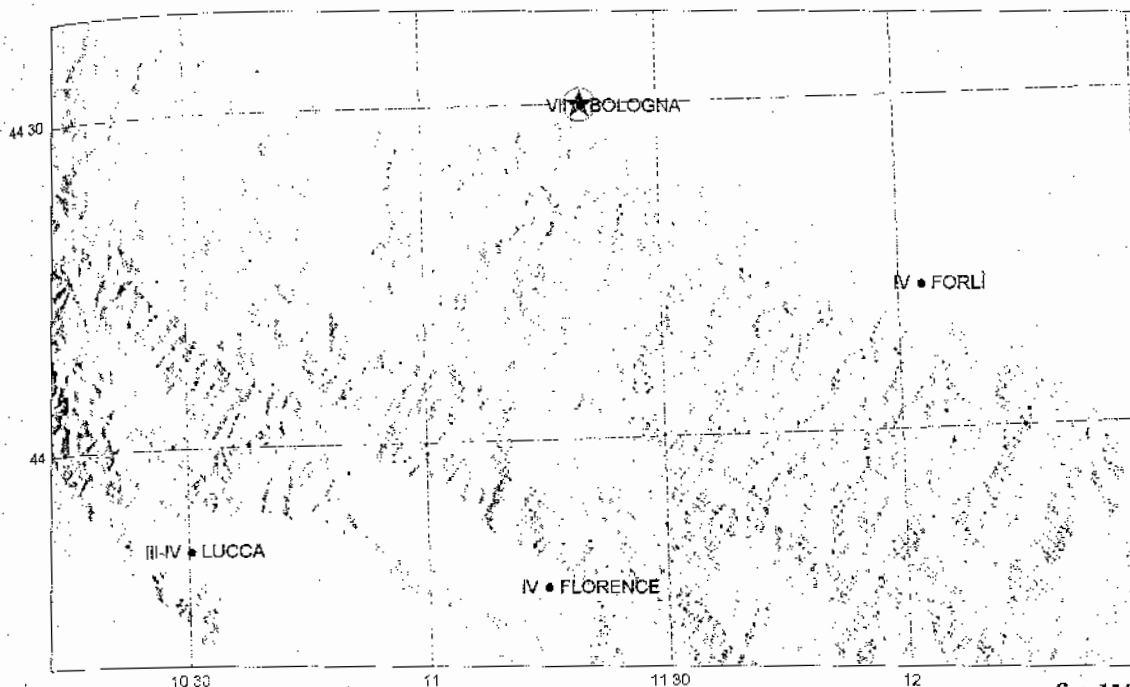
A dì 4 di magio 1433 la mattina circa le 13 hore venne uno tremuoto mezzanetto.

The shock is also mentioned in the diary of Ruberto dal Portico, a nobleman of Lucca who is quoted by Guidi (1915, p.23):

"1433. On 4 May there was an earthquake between the 12th and 13th hours".

"1433. Alli 4 di Maggio fu tremuoto tra le 12 e 13".

No results were obtained from our research at the Archivio di Stato in Bologna, where the following collections were consulted: *Diritti e oneri*; *Massari del contado*; *Ufficio dei fertilizi e di munizione dei castelli*, and *Demaniale*; nor at the Archivio Storico Comunale at Bazzano, where we consulted the following collections: *Archivio dei vicariati e del capitanato di Bazzano* and *Vicariato di Piumazzo*.



1433
May 4

0 30 km

fig. 110

▲ 1433 05 04 8:05 UT ★ 44 30 11 20 I₀ = VI Me = 5.5 Sites: 4

localities	lat.	long.	I	localities	lat.	long.	I
Bologna	44 30	11 20	VII	Forlì	44 13	12 03	IV
Florence	43 47	11 15	IV	Lucca	43 51	10 30	III-IV

< 292 > 1434 November 6 Cairo [Egypt]

sources 1 al-Maqrizi, *al-Suluk*, IV, 2, p.935; Ibn Hajar, *Inba*, III, p.546; al-Jawhari, *Nuzhat*, III, p.308

sources 2 al-Suyuti, *Kashf*, p.57; Ibn Iyas, *Bodai'*, II, p.161

literature Taher (1979)

catalogues d. *Ambraseys *et al.* (1994)

catalogues p. Poirier and Taher (1980)

On 6 November 1434, before midday, a minor shock caused houses in Cairo to shake. The shock was brief and did not cause any damage. Information about the earthquake can be found in contemporary and slightly later Arab sources. Al-Maqrizi records:

"On 3 [of *Rabi' II* = 6 November], shortly before midday, there was an earthquake at new Cairo (Al-Qahira). Houses shook, and there would have been a great deal of damage if the earthquake had not been so brief".

في ثالثة (ربيع آخر) قبيل الظهر حدثت زلزلة بالقاهرة تزلزلت بها الدور والأماكن ولو أقامت قليلا لأخرت ما زلزلت.

Al-Jawhari repeats almost literally the words of al-Maqrizi: "On 3 [of *Rabi' II* = 6 November], before midday, there was an earthquake in new Cairo which shook houses and other buildings, and if it had lasted longer it would have destroyed what it shook".

في ثالثة قبل الظهر حدثت زلزلة بالقاهرة تزلزلت بها الدور والأماكن ولو أقامت قليلا لأخرت ما زلزلت

Ibn Hajar records: "In the month of *Rabi' II* [4 November – 2 December], there was a slight earthquake which rapidly came to an end".

و في رابع منه وقعت زلزلة لطيفة و زالت بسرعة .

Al-Suyuti records: "In the year [8]38 [of the Hegira = 7 August 1434 – 26 July 1435] in the month of Rabi' II [4 November–2 December] there was an earthquake at now Cairo".

و في سنة ثمان و ثلاثين في ربيع الآخر حدثت زلزلة بالقاهرة .

Although Poirier and Taher (1980, p.2193) give the correct date in the Islamic calendar (3 Rabi' II 838), they mistakenly convert it to 7 November 1437. They give Cairo an intensity of grade VI MM. Ambraseys *et al.* (1994) give it an epicentral intensity of class S, which is equivalent in their classification to a range from between strong and damaging (approximately VI to VII MSK).

▲ 1434 11 06 shortly before midday

localities	lat.	long.	I
Cairo	30 08	31 15	IV-V

< 293 > **1437 September 4–24 Constantinople [north-western Turkey]**

source Syrop., *Mém.*, III.12, p.172

literature Laurent (1971b)

catalogues d. Wirth (1966); Evangelatou-Notara (1993); *Papazachos and Papazachou (1997)

At some unspecified time between 4 and 24 September 1437, there was an earthquake at Constantinople (now Istanbul), which the source describes as "great", but without any effects being indicated. The earthquake is mentioned by Sylvester Syropulus, a high-ranking prelate in the Byzantine patriarchate, and interpreted as a sign of divine disapproval. After recording the arrival of a papal delegation at Constantinople, Syropulus continues as follows:

"Indeed, when the triremes came to a halt and the moorings were lowered, there was a great earthquake, which the clear-sighted took to be a sign of divine wrath".

ἀμα γὰρ τῷ στήναι τὰς τριήρεις ἐν τῷ λιμένι καὶ χαλᾶν τὰ πρυμνήσια, εὐθὺς σεισμὸς ἐγένετο μέγας, καὶ θεομηνίαν οἱ συνετώτεροι τοῦτο ἠγήσαντο.

There follows a reference to what is presumed to be a prophecy of the event, made thirty years earlier by a scholar named Demetrius Chrysoloras. The second redaction of the text records the anecdote differently. Wirth (1966, p.396) considers this information to be tendentious. Laurent (1971b, p.173, note 12) is less negative, in that he does not exclude the possibility that there may have been a shock without damage.

▲ 1437 09 4–24

localities	lat.	long.	I
Istanbul	41 02	28 57	V?

< 294 > **1437 November 24–27 Constantinople [north-western Turkey]**

source Syrop., *Mém.*, IV.1, p.196

historiography Laurent (1971b)

catalogues d. Wirth (1966); Evangelatou-Notara (1993); *Papazachos and Papazachou (1997)

At some unspecified time between 24 and 27 November 1437 there was an earthquake at Constantinople (now Istanbul), but no effects are indicated. The earthquake is mentioned by Sylvester Syropulus in a narrative of his journey by sea from Constantinople

to Italy, and once again it is interpreted as a sign of divine wrath. Syropulus records that shortly before departure:

"there followed another earthquake, a second sign of divine wrath".

καὶ εὐθὺς πάλιν σεισμὸς ἐγένετο, σύμβολον δευτέρας θεομηνίας.

Wirth (1966, p.399) is as doubtful about this earthquake as about the previous one mentioned by Syropulus.

▲ 1437 11 24-27

localities	lat.	long.	I
Istanbul	41 02	28 57	NC

< 295 > 1437 November 27 Madytus [north-western Turkey]

source Syrop., *Mém.*, IV.4, p.200

catalogues d. Wirth (1966); Evangelatou-Notara (1993); *Papazachos and Papazachou (1997)

On 27 November 1437, an earthquake shock in the Madytus (now Eceabat) area was felt at sea and described as "great". The earthquake was witnessed by the members of a delegation headed by Sylvester Syropulus, which was on its way by ship from Constantinople to Italy. Once again, the earthquake was interpreted as a sign of divine wrath. Sylvester Syropulus himself records that the first stop on the journey was at Madytus:

"and shortly afterwards there was another earthquake, so great that we all clearly felt it on the galley, and we took it as a third sign of divine wrath".

καὶ μετ' ὀλίγον σεισμὸς αὐθις ἐγένετο μέγας, ὡς καὶ ἐν τῷ κατέργῳ ἀριδίλως γνωρισθῆναι πᾶσιν ἡμῖν, καὶ ὡς τρίτην θεομηνίαν τοῦτ' ἐτεκμηράμεθα.

Wirth (1966, pp.396, 399) has doubts about the truth of the account, as with the previous two earthquakes, and he thinks any shock must have occurred during the second day at sea, i.e. on 28 November, even though the only date mentioned by Syropulus is 27 November, which he gives as the beginning of the voyage.

▲ 1437 11 27

localities	lat.	long.	I
Eceabat	40 11	26 21	NC

< 296 > 1438 February 2 Grottaferrata [central Italy]

source *Notula* in Lampros (1910, p.157, no.116)

historiography Allen (1890); Lampros (1910); Lilla (1970); Follieri (1977; 1979)

catalogues d. Grumel (1958); Wirth (1966); Evangelatou-Notara (1993)

This earthquake is mentioned in some catalogues without a location; it is unknown to seismological studies and current Italian catalogues.

On 2 February 1438, at 12:15 UT (the seventh hour), there was an earthquake which the source describes as "terrifying". Information about this earthquake is to be found in a *Notula* in manuscript 41 (B.3.11), fol.140v. in the Biblioteca Angelica in Rome:

"In the year 6946 [1 September 1437 – 31 August 1438], on 2 of the month of February, there was a terrifying earthquake at the seventh hour of the day".

αα [=ελ] σαρακοστό ἔκτο· μνη φεβρουαρη· ης τας β' εὐένετο σησμος φοβερὸς ορα εὐδομι της ημερας.

This *Notula* is quoted in Allen (1890, p.40), where the year is given tentatively as 1028. Lampros (1910) subsequently suggested 1438. That date has been accepted by Grumel (1958), Wirth (1966) and Evangelatou-Notara (1993), but none of them has suggested even a hypothetical area for the earthquake mentioned in the *Notula*, so it has remained unidentified. In order to attempt to identify the location, it has been necessary to investigate more thoroughly the history of the codex concerned, taking advantage of codicological studies. Greek codex 41 (B.3.11) in the Biblioteca Angelica in Rome consists of two manuscripts of works by Theodoret (a 5th century A.D. writer). The first of these (fols.2-55v) contains commentaries on the Old Testament, and the second (fols.56-140) consists of the 5 books of his *Historia Ecclesiastica*.

The first manuscript was probably written in Basilian abbey circles in Calabria in the closing decades of the 10th century; it has been attributed by Lilla (1970, pp.10-3) and Follieri (1977, p.221; 1979, pp.324-5) to a monk named Paolo who was a copyist of the St.Nilus school and subsequently became abbot of the important abbey of Grottaferrata, founded by St.Nilus in 1004. At some unknown date the codex was taken to the abbey of Grottaferrata, where it remained for some centuries. The second manuscript was written in the 11th-12th century. The *Notula* was probably written when the codex was at Grottaferrata, before it joined the Biblioteca Angelica collections. We therefore think there are reasonable grounds for supposing that the *Notula* was written by a monk at Grottaferrata who felt the "frightening" earthquake of 2 February 1438.

▲	1438 02 02	12:15 UT		
localities	lat.	long.		I
Grottaferrata	41 47	12 41		VII-VIII?

< 297 > **1438 February 13 Cairo [Egypt]**

sources 1	al-Maqrizi, <i>al-Suluk</i> , IV, 2, p.1029; al-Jawhari, <i>Nuzhat</i> , III, p.402
sources 2	al-Suyuti, <i>Kashf</i> , p.58; Ibn Iyas, <i>Badai'</i> , II, p.181
literature	Täher (1979)
catalogue d.	*Ambraseys <i>et al.</i> (1994)

On 13 February 1438, at about 14:00 UT, two minor shocks were felt at Cairo. Information about the earthquake can be found in al-Maqrizi, a contemporary Arab source, and in three other Arab writers of slightly later date. Al-Maqrizi writes: "In that month [*Sha'ban* = 28 January – 25 February], there was another earthquake at new Cairo (*Al-Qahirā*), at the hour of afternoon prayer. There were two shocks, but they were very slight, thanks be to God".

وفيه (شهر شعبان) أيضا حدثت بالقاهرة زلزلة عند أذان العصر اهتزت بها البيوت مرتين إلا أنها كانت خفيفة جدا والله الحمد.

al-Jawhari indicates the day on which the earthquake occurred: "On that day [17 *Sha'ban* = 13 February], towards the hour of afternoon prayer, there was an earthquake at new Cairo: the earth was shaken twice by it, but it was a very slight earthquake, praise be to God".

و فيه وقعت بالقاهرة زلزلة عند أذان العصر و اهتزت منها الأرض مرتين، إلا أنها كانت خفيفة جدا، و لله الحمد و المنة.

al-Suyuti writes: "In the year [8]41 [1438], in the month of *Sha'ban*, there was a slight earthquake at new Cairo".

و في سنة إحدى و أربعين في شعبان حدثت بالقاهرة زلزلة لطيفة.

Ibn Iyas writes: "In that month [*Sha'ban*], there was a minor earthquake at new Cairo which caused the ground to sway twice".

و فيه وقعت زلزلة خفيفة بالقاهرة، ماجت الأرض منها مرتين.

Ambraseys *et al.* (1994, p.49), mistakenly give the day of the earthquake as 25 February 1438: 17 *Sha'ban* 841 of the Hegira in fact fell on 13 February, not 25. These authors give it an epicentral intensity of class F, which is equivalent in their classification to a range from felt to strong (up to grade VI MSK).

▲ 1438 02 13 14:00 UT
 localities lat. long. I
 Cairo 30 03 31 15 III

< 298 > 1438 June 11 Parma area [northern Italy]

source Da Ripalta Antonio, *Ann.*, cols.875-6
 historiography Poggiali (1757-66); Boselli (1793); Dal Verme (1828); Rossi (1829); Pezzana (1837-59); Ottolenghi (1969); Pizzi (1981)
 catalogues d. Perrey (1848); Mallet (1853); Mercalli (1883); Benassi (1899); Baratta (1901); Milne (1911); *Boschi *et al.* (1995, 1997, 2000)
 catalogues p. Giorgetti and Iaccarino (1971); Carrozzo *et al.* (1973); Postpischl (1985); CPTI (1999)

During the night of 11 June 1438, at 02:00 UT (the seventh hour, "Italian time"), a strong earthquake struck the city of Parma, where part of the town hall collapsed, and the neighbouring towns of Castelnovo, where parts of the built-up area collapsed, and Borgo San Donnino (present-day Fidenza). The earthquake was also felt at Piacenza.

The event is recorded in the contemporary *Annales Placentini* by Antonio da Ripalta, a nobleman of Piacenza who took an active part in the political life of the city:

"In the year of Our Lord 1438, on the 10th day of June, at the seventh hour of the night, as the feast of St. Barnabas was approaching, there was an earthquake at Piacenza and Parma and neighbouring places, at Castelnovo Parmense and Borgo San Donnino; and some houses collapsed at that time, as did part of the *Palazzo* in the city of Parma, and part of the already-mentioned town of Castelnovo".

Anno Domini 1438 die 10 Junii hora septima noctis adveniente festo Sancti Barnabae fuit terrae motus Placentiae, et Parmae, et in locis vicinis, in Castello-Novo Parmensium, et in Burgo Sancti Donnini; et tunc temporis nonnullae domus ceciderunt, et tunc etiam ruit pars Palatii in civitate Parmae existentis, et pars Castelli-novi antedicti.

▲ 1438 06 11 2:00 UT ☉ = 44 51 10 14 I₀ = VIII Me = 5.6 Sites: 4
 localities lat. long. I localities lat. long. I
 Castelnovo 44 52 10 20 VIII Fidenza 44 52 10 04 VII-VIII
 Parma 44 48 10 20 VIII Piacenza 45 03 9 42 V

< 299 > 1441 Xlat' [eastern Turkey] ▷ volcanic eruption ◁

source 1 colophon in Xac'ikyan (1955, pp.515-6, no.581)
 source 2 colophon in Xac'ikyan, year 1443 (1955, p.546, no.621)
 literature Abich (1882)
 historiography Zeyt'unyan (1991)
 catalogues d. Kostaneanc' (1902); Oswald (1906); Step'anyan (1964)
 catalogues p. Ergin *et al.* (1967); Tchalenko (1977); Ambraseys and Adams (1989)

At Xlat' (present-day Ahlat, eastern Turkey) there was a strong earthquake in 1441, related to an eruption of the Nemrut volcano (Nemrut Dagi). Evidence for this is to be found in a colophon in a menology written at Van by a scribe called Vardan. We read in the colophon:

"In this year [890 = 1441] a great sign took place, for the mountain called Mamrut [Nemrut], which lies between Xlat' and Balesh [now Bitlis], suddenly began to rumble like heavy thunder from clouds. Children cried and complained to their parents, for they saw the ice crack open over an area as broad as a city [?] and other fragments [?]; and as flames arose out of this cleft, they were shrouded in dense, whirling smoke of so evil a stench that the children breathing it became ill. Stones glowed in the terrible flames, and boulders of enormous size were hurled aloft with peals of thunder. And the city of Xlat' was seized with terror because of this shock. In other provinces, too, men clearly saw it all".

Յայսմ ամի մեծ նշան եճև, քանզի լեառն Մամրուտ կոչեցեալ, որ ի մեջ Խլաթ և ի Բաղէշ է, յանկարծակի գողաց, իբրև զաստիկ որոտումն ամբոյ, որ երկիրն ամենայն ահաբեկ եղեալ ասասնեցան, որ և տղայքն ընդ հարս և ընդ մարս ողբս առեալ լային, վասն զի տեսին, որ սառն պատառեցաւ լայն՝ իբր քաղաք մի և այլ փոքր փոքր, և ի պատառուածէն ի վեր հուր ցոլացեալ ելանէր մարախլապատ ծխով և ժահահոտութեամբ, որ և տղայքն ի հոտոյն հիւանդանային, և քարինք եռային յահագին բոցոյն, և մեծամեծ վեմն ընդ երկինս ձգէին ձայնի որոտմամբ. որ և ի դղմանէն Խլաթ քաղաք կարծին առեալ դողային: Ձայս ամենայն տեսին աչօր բացօր և այլլ գացաւք.

Tchalenko (1977, p.200) considers this event to be "the most recent known volcanic activity" of Nemrut volcano. Ambraseys and Adams (1989, p.152) refer to the earthquake in a diagram showing the principal earthquakes affecting the region of northern Armenia, mentioning "unpublished sources". In fact these are known sources, for they appear in the seismological literature, at least since Abich (1882, p.438 and 445). The source for this earthquake is a contemporary colophon. Kostaneanc' (1902, p.10; 21), followed by Ergin *et al.* (1967, no.176, but see no.177), dates this event to 1439.

▲ 1441 --

localities	lat.	long.	I	localities	lat.	long.	I
Ahlat	38 45	42 29	V?	Nemrut volcano	38 40	42 12	ER

< 300 > 1444 shortly before August 25 Southern Adriatic Sea [Montenegro]

sources ASVe, *Senato Mar*, reg.2, fol.26r., 25 August 1444; fol.27r.-v., 25 August 1444; fol.135r., 28 March 1446

historiography Thiriet (1961)

catalogues d. Wirth (1966); Evangelatou-Notara (1993); *Papazachos and Papazachou (1997)

catalogues p. Shebalin *et al.* (1974)

Shortly before 25 August 1444, a strong earthquake struck Dulcigno (now Ulcinj) on the Adriatic coast of present-day Montenegro, at the frontier with Albania. There was serious damage to a large part of the town walls, the castle, and most houses. The castle roof collapsed, and the Venetian Senate was immediately asked for iron, five hundred wooden planks, fifty small beams and two thousand tiles for repairs. The Venetian Senate unanimously decided to grant 50 gold ducats for the repairs.

Information about this earthquake comes from three documents in the Archivio di Stato of Venice (*Senato Mar*, reg.2), the original versions of which have not been known until

now. The catalogues by Wirth (1966, pp.397, 399), Evangelatou-Notara (1993, p.105) and Papazachos and Papazachou (1997, p.196) use a regest by Thiriet (1961, III, pp.116-7, no.2662) as their source in recording that a terrible earthquake devastated the coastal regions of Dalmatia and Greece. At Lepanto (present-day Nafpaktos, at the western end of the Gulf of Corinth), a large part of the city walls is supposed to have collapsed. By examining the sources directly, however, it has been possible to obtain a clearer picture of the extent of the damage and where it occurred. A first-hand analysis of the sources has also shown that there is no mention of earthquakes in Senate decisions concerning Lepanto, and we therefore conclude that it was not affected by the earthquake. The first document (fol.26r.), is dated 25 August 1444, and consists of a petition from the Dulcigno community, lodged immediately after the earthquake, requesting money for repair work in the town, and asking permission to use some cash previously deposited in a fund at the neighbouring town of Scutari:

"On 25 August [1444]. [...] before your most pious and clement Serenity, your very faithful community of Dulcigno most humbly petitions that, having regard to the wretched and unhappy event of the earthquake, your illustrious Serenity should deign to order that a grant be sent for repairing the castle and also the town walls and your poor citizens' houses, most of which are almost completely in ruins. The citizens will get by as best they can provided that the town and castle walls are reinforced; and if your illustrious Serenity deigns to make a grant, it could be sent without difficulty via Scutari. The fact is that for many years, a thousand ducats a year have been deposited every year in a fund at Scutari, amounting to several thousand ducats, deposited there in the name of the governor. And we therefore petition anew that your very clement Serenity should order to be granted a sufficient sum to repair the castle and the town walls at those places where they have collapsed [*manchada*] and fallen in ruins [*ruinade*], or as much or as little as may please your illustrious Serenity, and we humbly remind you that if our town is protected by walls, your poor citizens will manage to get by. But with the castle in ruins as well as the town walls in several places, the said poor citizens and other inhabitants of the said place will gradually go and live elsewhere as best each one can and the said place will be left in total desolation. If however your illustrious Serenity deigns to provide help, this will not happen.

[Chancery annotation] Let a reply be sent, that having learned of the unfortunate event and the damage to the walls and castle of that town of ours, we have written suitably to our count and captain of Scutari, so that he shall make due provision for repairs as best and most usefully he can, and in this way we do not doubt that our orders will be carried out promptly, and we shall also order that these letters of ours written to our count and captain at Scutari shall receive a reply. So be the reply of this council".

Die XXV Augusti [1444]. [...] dananti la piüssima et clementissima serenitade vostra humilimamente et devotissime et se supplicha per parte de la vostra fidelissima comunità de Dulcigno che considerando el miserabele et infelicissimo chaxo successo per el terremoto, che essa Illustrissima Serenitade Vostra se degni de comandar el sia mandado subvencion a refecion del castello et eciandio de le mure de la citade che de le chaxe di poveri vostri cittadini de le qual la maor parte et quaxi tute sono ruinade loro se la passerano al meio chi porà pur che la forteça del muro se la passerano al meio chi porà pur che la forteça del muro de la citade et del castello sia, la qual subvencion dignandosse la Illustrissima Serenitade Vostra de lievé se porà haver per la via da Scutari. Cum zò sia che zà più anni passadi ogn'ano el sia sta depositado in una capsia in Scutari ducati mille al'anno che sono parechy miara de ducati, li qual fono y depositadi al nome del signor dispoti. Et perhò denovamente et se supplicha che de quei tal denari la clementissima Serenitade Vostra se degni comandar el sia sovegnudo tanto che basti a refecion del castello et de le mure de la citade, zoè dove sono manchada et ruinade e tanto più o men quanto par e piaxe ad essa Vostra Illustrissima Serenitade devotamente

arecordando che se la dita citade sarà murada i vostri poveri cittadini pur se la passerano al meo chi porà. Ma siando ruinado el castello et le mure de la citade chomo in più parte sono li diti poveri zitadini et altri habitadori nel dito luogo anderano ad habitar altro de tempo in tempo dove meo chadaun porà el dito luogo romagnerà in total desolacion. Et perhò degnisse la Illustrissima Serenitade Vostra proveder che chussi non sia.

[Chancery annotation] Respondeatur quod intellecto quam primum miserabili casu et ruina murorum et castris illis terre nostre scripsimus oportunè comiti et capitaneo nostro Scutari ut ad eius reparationem quanto melius et utilis fieri posset debite provideret sicque non dubitamus mandata nostra sollicite exequi debere et tunc dictas litteras nostras scriptas ipsi Comiti et Capitanus nostro Scutari mandabimus replicari. Et sic autem huius consilii replicentur.

The second document (fol.27r.-v.) is also dated 25 August 1444. In it the Venetian Senate unanimously decides to grant fifty gold ducats for the most urgent repairs to Dulcigno castle roof:

"25 August [1444]. We have learned and are writing to our count and captain of Dulcigno, about the dreadful earthquake which recently occurred in that town of ours, damaging most of the walls of the town and castle as well as the houses, and we are writing that repairs to the said castle should be undertaken, since it is left roofless and cannot be inhabited unless suitably repaired. And this same count of ours writes and requests by messenger half the iron, together with five hundred planks, fifty beams and two thousand tiles for repairing and reroofing the said castle, these materials being sufficient to make a satisfactory repair. Let us vote in favour, so that the said materials can be assigned to the messenger, to the value of approximately fifty gold ducats".

Die XXV augusti [1444]. Cum sicut manifestum est et scribit nostro Dominio Comes et Capitaneus nostri Dulcinii ex terribili terremotu his superioribus diebus secuto in illa terra nostra muri dicte terre et castris et domus pro maiori parte ruinati sunt et ad reparationem castris predicti quod sine cohopto remansit et ahbitari non potest nisi debite reparetur omni bono respectu providendum sit. Et idem comes noster scribat ac requirat per nuncium unum cum dimidio ferri tabulas quingentas travatulos quinquaginta et duo miliarum cuporum pro reparatione et cohopto dicti castris cum quibus rebus satis decenter reparari poterit. Vadit pars ut dicte res assignari possint eidem nuncio que summam ducatos quinquaginta auri vel circa ascendunt.

The third document (fol.135r.) is dated 28 March 1446. More than eighteen months after the earthquake, the Venetian Senate received fresh requests for help from the governor and community of Dulcigno. Because of their poor financial resources, the latter had not yet managed to finish repair work. The Senate therefore unanimously agreed to authorise the governor of Dulcigno to draw two loads of salt from Corfu and use the proceeds from selling it to carry out the necessary repairs:

"28 March [1446]. Our Governor at Dulcigno writes, and our faithful community there petitions us that most of the walls of that town of ours and of the castle are in ruins as a result of the dreadful event of the earthquake, and that a substantial sum of money is required for their repair, and that the local authority there is very poor and can therefore make only a very small contribution towards those repairs, and that the town is in a sorry state with its walls in ruins and therefore exposed. However, money cannot be sent at present from here to Dulcigno for these repairs, and cannot easily be acquired elsewhere. And so for the honour of our rule and the benefit of that town and our faithful people, let provision be made, in order that what is best for them can be done".

Die XXVIII martii [1446]. Cum sicut scribit Rector noster Ducinii et etiam illa fidelis nostra communitas nobis fecerit supplicari muri illius civitatis nostre et castris ob terribilem casum terremotus ruinati sint in maiori parte et pro ipsorum reparatione bona pecuniarum summa requiratur et camera illa nostra pauperima sit ita ut minime ad

reparationem ipsam contribuere valeat et terra ipsa male stet sic muris dirruptis et aperta. Et considerato presenti tempore de hinc illuc pecunia mitti non possint pro reparatione predicta neque de alio loco commode recuperari possent. Et sit honor nostri domini et bonum dicte terre et ipsorum fidelium nostrorum iuxta eorum ut melius fieri potest providere.

▲ 1444 shortly before 08 25

localities	lat.	long.	I
Ulcinj	41 56	19 12	VIII-IX

(301) **1448 May 25 Catalonia [Spain]**

literature Salicrú i Lluch (1995)

catalogues d. Sieberg (1932b); Fontserè and Iglésies (1971); *Atlas sísmic de Catalunya* (1999); Martínez Solares and Mezcua Rodríguez (2002)

In the case of this earthquake only, we have not carried out original research but have used the information provided in the study by Salicrú i Lluch (1995). However, we provide an intensity estimate for the localities affected, which does not appear in Salicrú i Lluch (1995); in some cases, the type of damage involved, affecting church buildings only, has necessitated using A and B values (see Legend p.15).

Salicrú i Lluch (1995) provides a survey of available information, adding new and unpublished archive sources preserved in the Diocesan Archives and Archives of the Crown of Aragon in Barcelona to the chronicle and narrative sources collected by Fontserè and Iglésies (1971) — a fundamentally important reference work and the starting point for any study of historical seismicity in Catalonia.

After midnight and before the first hour of the night of 24-25 May 1448, there was a strong earthquake in Catalonia — the region of north-east Spain which lies between the Pyrenees and the Mediterranean coast. The places which suffered most damage were in the diocese of Barcelona, and to a lesser extent in that of Vic. The only place for which we know the duration of the earthquake is Perpignan, which lay within the territory of the Crown of Aragon at that time, though it is now in France. In relation to the epicentre, this is the most northerly place affected, and the shock lasted more than 20 seconds there (the time needed to recite the Lord's Prayer and a Hail Mary). There was extensive damage in the diocese of Barcelona, and the following castles collapsed: Llinars, where collapsing houses were responsible for some victims; El Papiol, where three people were killed; Sentmenat, where a boy was killed; and Montornès. At Sant Cristòfol de Monteugues, the parish church was completely destroyed and had to be rebuilt; at Santiga, the parish church was reduced to ruins and subsequently demolished. At Bigues, two women died in the ruins of a house, and at Granollers, part of the church collapsed. At Mataró, part of the parish church of S.Maria collapsed, the church tower broke off in the middle and collapsed along with the bells. Damage to the church was so serious that the building was in danger of collapse. At the parish churches in Sant Miquel de Mata (in the same area as the village of Mataró), Sant Andreu de Llavaneres and Sant Vicenç de Llavaneres, the bell chambers and bells were badly damaged and collapsed in ruins. A pastoral visit recorded that the above four buildings were already in need of repair in 1446, before the earthquake. In the parish of Esparreguera, a fire and the earthquake caused much of the hermitage of Sant Salvador de les Espases to collapse, and it became uninhabitable. At Barcelona, so wide a crack appeared in the Castell Nou that a person could pass through it, and a number of houses — some close to the church of S.Miquel — were badly damaged. Castell Nou had been in such a poor state of preservation, at least



1448
May 25

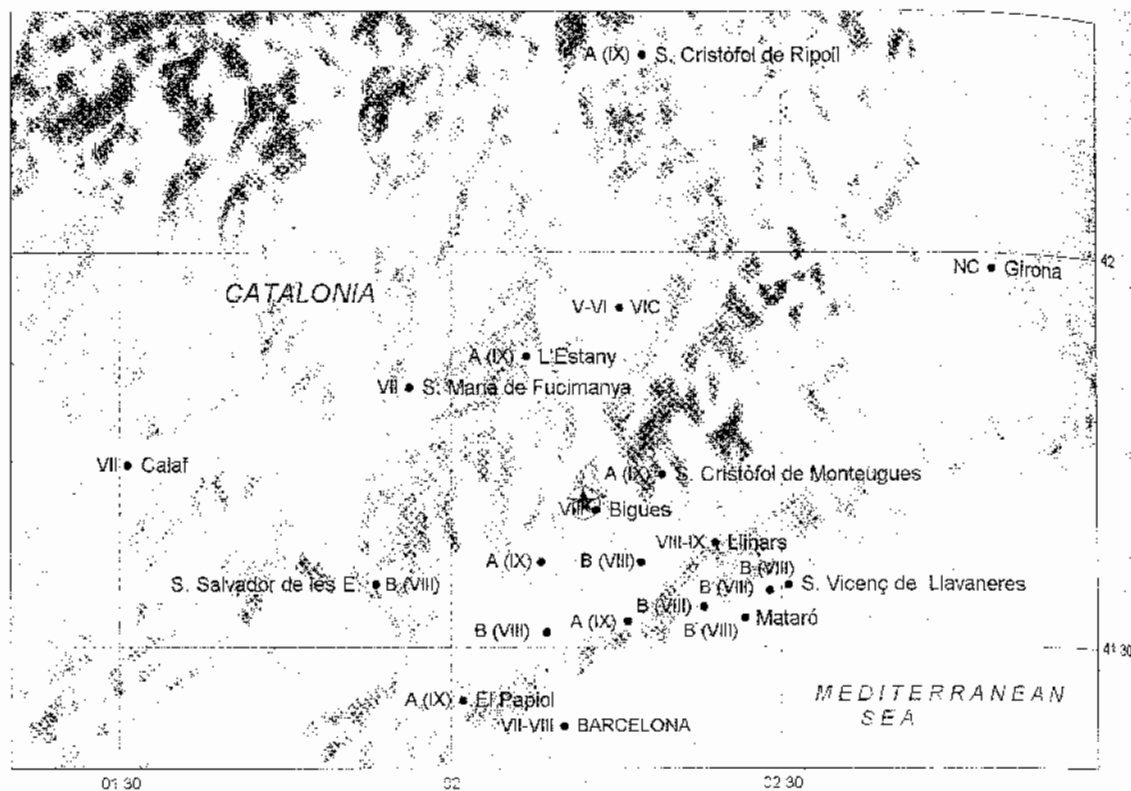


fig. 111

since 1418, that the king had been advised to demolish rather than repair it; but it survived until the 16th century.

Earthquake effects in the diocese of Vic were as follows: at L'Estany, a monk was killed in the collapse of the monastery of S. Maria; in the parish of Ripoll, the church of S. Cristòfol de Ripoll collapsed, and it was replaced by a new building; at Calaf, the front part of the castle collapsed; in the parish of S. Martí de Serraima, the church of Santa Maria de Fucimanya was damaged. In the city of Vic there was no damage. The earthquake was felt at Perpignan and in the Rosselló area, but caused no damage there. We cannot establish the exact nature of effects at Girona for lack of a detailed description. Damage to the church of Santa Maria de Fucimanya and the church of Sant Cristòfol de Ripoll was wrongly attributed by Fontserè and Iglésies (1971) to an earthquake in September 1450. In fact, documentation preserved in the Diocesan Archives at Vic make such an attribution impossible, since it is dated July 1450.

▲ 1448 05 25 0:00-1:00 UT ★ = 41 41 02 12 I₀ = IX Me = 6.4 Sites: 22

localities	lat.	long.	I	localities	lat.	long.	I
El Papiol E	41 26	02 01	A (IX)	S. Miquel de Mata E	41 33	02 23	B (VIII)
L'Estany E	41 52	02 07	A (IX)	S. Salvador de les E. E	41 34	01 53	B (VIII)
Montornès E	41 32	02 16	A (IX)	S. Vicenç de Llavan. E	41 35	02 31	B (VIII)
S. Cristòfol de Mont. E	41 43	02 19	A (IX)	Bigues E	41 40	02 13	VIII
S. Cristòfol de Ripoll E	42 15	02 17	A (IX)	Barcelona E	41 25	02 10	VII-VIII
Sentmenat E	41 37	02 08	A (IX)	Calaf E	41 44	01 31	VII
Llinars E	41 38	02 24	VIII-IX	S. Maria de Fucim. E	41 50	01 56	VII
Granollers E	41 36	02 17	B (VIII)	Vic E	42 56	02 15	V-VI
Mataró E	41 32	02 27	B (VIII)	Perpignan F	42 42	02 54	F
S. Andreu de Llavan. E	41 34	02 29	B (VIII)	El Rosselló F	42 36	02 31	F
Santiga E	41 31	02 09	B (VIII)	Girona E	41 59	02 49	NC

< 302 > 1452-1453 Constantinople [north-western Turkey]

source Critobulus, *Hist.*, p.37
catalogue d. Evangelatou-Notara (1993)

At some unspecified time in the years 1452-1453 there were earthquakes at Constantinople which the source describes as "unusual and strange". The major effects zone is unknown. Information about these earthquakes can be found in the work of the contemporary Byzantine historian Critobulus. Together with a long list of extraordinary prodigies and natural phenomena interpreted as divine warnings, he mentions "unusual and strange earthquakes and shakings of the earth".

σεισμοί τε ἀήθεις καὶ ξένοι καὶ βραστοὶ γῆς.

▲ 1452-1453

localities	lat.	long.	I
Istanbul	41 02	28 57	F

< 303 > 1453 September 28 Florence [Tuscany, Italy]

< 304 > 1453 September 29 - 1454 May Florence

sources 1 [manuscripts] ASFlorence, *Tratte*, 132bis, C.183, *Registro*; *Tratte*, 448, Paoli, *Priorista*, fol.116; *Carte Stroz.*, II, 16bis, Tommaso Giovanni, *Ricordanze*, fol.17; *Carte Stroz.*, II, 103, *Priorista*, fols.135v-136r; *Mss.*, 120, *Copie di note*, fol.228v; BNCFlorence, *Fondo princ.*, II, IV, 128, *Nota*, fol.104; *Conv. soppr.*, S.M.Novella, C.4.895, Chiari, *Priorista*, fol.165r; BRiccMor, Florence, *Mss. Moren.*, 136, *Memorie*, fol.117r; *Mss. Moren.*, 277, *Priorista*, fol.200r; *Mss. Riccard.*, 1030, *Ricordi*, fol.12r;

Sozomeno Pist., *Chron.*, p.49; Pierozzi, *Chron.*, pp.95-6; Rinuccini, *Ricordi*, p.lxxx;
Buoninsegni, *Storie*, p.106; *Cron. Ramp.*, IV, p.193; *Cron. Varign.*, IV, p.194

sources 2 ASFlorence, *Mss.*, 117, *Diario*, fol.22; *Mss.*, 235, *Priorista*, fol.20v; *Mss.*, 238, Spinelli, *Priorista*, fol.296; *Carte Stroz.*, II, 106, *Priorista*, fol.106; BNCFlorence, *Magliabechiano*, VIII, 1488, *Ricordi*; *Magliabechiano*, 2-1-313, *La città*, fol.68; *Banco Rari*, 22-23, De' Ricci, *Priorista*; *Codice Palatino-Baldovinetti*, 44, *Memoriale*, fol.37; BRiccMor, Florence, *Mss. Moren.*, 1936, *Priorista*, fol.269v; *Mss. Moren.*, 36, Buondelmonti, *Priorista*, fol.184v; *Mss. Riccard.*, 1851-1852, *Diario*, fols.98v-99r; *Mss. Riccard.*, 3628-3698, *Diario*, fol.143v;
Cambi, *Ist.*, vol.20, p.316

historiography Ammirato (1600-41); Mecatti (1755); Richa (1758)

literature Baratta (1895); Ferrari and Marmo (1985); Castelli (1991); SGA Report [1991];
Vanni Desideri (1992); Guidoboni and Ferrari (1995); Vanni Desideri and Vannini (1997);

catalogues d. Bonito (1691); Perrey (1848); Mallet (1853); Mercalli (1883); Guarini (1880); Giovannozzi (1895a, b); Baratta (1901); *Boschi *et al.* (1995, 1997, 2000)

catalogues p. Giorgetti and Iaccarino (1971); Carrozzo *et al.* (1973); Postpischl (1985); CPTI (1999)

Effects of the earthquake of 28 September 1453

On 28 September 1453, at about 22:45 UT (half way through the fifth hour of the night, "Italian time"), a strong shock, followed by a series of aftershocks, struck Florence and in particular its extra-urban area. According to one source, this shock lasted for 7-8 seconds (the time required to recite a Hail Mary), while another source maintains that it lasted about 25 seconds (the time required to recite the Lord's Prayer twice).

At Bagno a Ripoli, part of a tower collapsed and other buildings were badly damaged; at Camerata, the partial collapse of a building killed some children; and at Vincigliata,

there was unspecified serious damage. According to recent archaeological studies (Vanni Desideri 1992; Vanni Desideri and Vannini 1997), the bell-tower of the church of S.Lorenzo at Signa was damaged. In the countryside around Florence, churches and many houses collapsed, and an unspecified number of people were killed.

In Florence itself, masonry was damaged and dislocated, and in addition to battlements, a great many chimneys fell down (from 1,000 to 5,000, depending on the source), but no buildings collapsed completely. The following buildings were damaged:

- *Palazzo Vecchio (Palazzo della Signoria)* was damaged, and the adjacent 94 m high tower was probably also affected. It was subsequently strengthened with iron chains;
- S.Maria del Fiore: some stones fell from the corners of the aisle alongside the canons' house and some cracks appeared in the vaulting. S.Maria del Fiore was Florence's new cathedral. It was completed in the closing years of the 14th century, but continued to be called S.Liperata in the sources. S.Liperata was in fact a corruption of S.Reparata, the ancient name of the previous church.

- convent of S.Marco: the library walls and vaulted roof were badly damaged.

A number of churches also suffered damage. The most severely affected area of the city was the northern district of San Gallo. Outside the city walls two people were killed when a tower collapsed.

The people of Florence were terrified. As soon as the first shock was felt, many fled in terror through the streets of the city, seeking refuge in open spaces (squares and gardens). Then they built shacks and put up tents and stayed in these makeshift refuges for a number of days. The authorities abandoned public buildings as well. Antonino Pierozzi, who was then archbishop of Florence and was later canonised, organised collective religious ceremonies lasting for four days. Large sums of money had to be spent on reinforcing damaged buildings; and the earthquake damage was aggravated by very strong winds. We have already referred to Signa (a locality about 14 km from Florence). When the bell-tower of the church of S.Lorenzo was being restored, an archaeological investigation was carried out, making it possible to trace its entire structural history from the time when it was originally built in the 12th century up to 20th century restoration work (Vanni Desideri 1992; Vanni Desideri and Vannini 1997). In particular, a whole cycle of damage and restoration work was identified and dated using archaeological, iconographic and historical methods.

The time of most significant damage was a pre-1462 period, in which the effects of 15th century seismic events were identified — especially those of the 1453 earthquake. Damage was found to have affected in particular the arches of the single and double light windows, where the keystones had in almost all cases given way to some degree, ranging from simple slippage to total collapse. Examination also revealed the system of consolidation put into practice after the earthquake. The principal method used was that of stopping up almost all the original openings in the bell-tower in order to reduce the number of weak points in the structure, and positioning a system of wooden ties to counteract the tendency of the walls to move apart.

Chronology

The sequence of seismic shocks continued until May 1454, and its stages can be reconstructed as follows:

1453 September 28 after the main shock, there was another, briefer one, followed by an unknown number of further shocks during the night;

September 29 a shock at vespers; three shocks during the night;

September 30-October 1 one or two slight shocks during the night;

October 27 and 28 more strong shocks;

November 8 more shocks, one of which was particularly strong;

1454 February more shocks until February 1454;

May the last shocks occurred in May of that year; none of them caused damage.

walls collapsed, and the fear-stricken populace took to prayer, and for four days there were processions with many women and men and some groups of manual workers who went in procession at night with a priest [...]. On Saturday evening and Sunday morning 27 and 28 October there were numerous great and frightening earthquakes, and several others came later, and to many people it seemed as though the earth was shaking almost continuously, now more and now less, though there were no earthquake sounds. On Thursday night, 8 November there were numerous earthquakes, one of which was violent, noisy and with strong shaking, and then others were felt for many days. [...] Then in May 1454 there were some more”.

Ricordo che venerdì notte a dì 28 settembre 1453 vegnente il sabato in fra 5 o 6 ore venne uno terremoto immensissimo e durò 1/3 d'ora così grande avvenga che il tremito durasse poi assai; di poi ne venne un altro et dimostrò in principio dover essere grandissimo ma finì presto e così in quella notte ne venne assai. Di poi sabato a dì 29 all'ora di vespro ne venne uno e così la notte seguente ne vennero tre e molti tuoni terribili e domenica notte ne venne uno o due piccoli. Caddero la prima notte infiniti camini e merli e in Santa Liperata caddero pietre da alto e apertesi certe volta e così in molti abitazioni in Firenze e contado ebbe grande pericolo et danno diruina. Dicesi in Firenze esser cascato più che cinquemila camini. La prima notte di subito uscivano le persone la più parte delle case e donne e fanciulle in camicia e scalzi usciti de' letti et spauriti fuggivano alle piazze e agli orti e così si fecero poi le stanze per le piazze et orti con trabacche e panni dove stavan la notte e durò più giorni. In contado caddono chiese e molte case e poche case furono che non si dannificassino poco o assai. Morirono più persone e massime in contado. Caddono in più luoghi de' merli et muri della città commosessi tutto il popolo a divozione et tremore e fecionsi 4 dì processioni con popolo invenerabile di donne e di uomini e commosenssi certi popoli di persone manuali col prete del popolo andavano la notte a processione [...]. Sabato sera e domenica mattina a dì 27 e 28 d'ottobre vennono più tremuoti grandi e spaventevoli e così prima e poi ne venne altri assai e a molti pareva che quasi del continuo la terra tremasse ma più una volta che un'altra benché non facessi il romore de' tremuoti. Giovedì notte a dì 8 di novembre più tremuoti ma uno grande con romore e tremito forte così bastò poi molti di che se ne sentirono alcuni. [...] Di poi di maggio 1454 ne vennono alcuni.

In the manuscript diary of the Chiari *Priorista* (Biblioteca Nazionale Centrale, Florence, *Conventi Soppressi*, Santa Maria Novella, C.4.895, fol.165r.) we read: “On Friday 28 September [1453] half way through the fifth hour of the night there was a tremendous earthquake in our city of Florence and its *contado*. More than a thousand chimneys collapsed in our city, and it shook many places and many walls and buildings, and it was so terrifying that people abandoned their houses and slept in the squares and gardens. And so the archbishop of Florence ordered 4 days of processions, in which a great number of men and women and flagellants [took part], and these earthquakes lasted until 29 October, and occurred very frequently. And then for several months they were less frequent and until 29 October the *signori* did not sleep in the *palazzo*, or if they did, they slept at the windows. When the first earthquake came, all the bells in the *palazzo* rang out, and many houses collapsed in ruins in our *contado*; there was general consternation. And when the earthquakes stopped, such dreadful winds blew that they made all the houses shake; and old people said they had never seen such a thing, and for that reason the *dieci di balia* set aside one thousand lire, and they gave that money for the love of God and so that we should pray to God in his grace to grant us a peaceful existence and remove this affliction. And because of their fears, many men and women took confession and communion and private citizens gave much in alms. And on the last day, the *signoria* went in procession with all their officials and the archbishop, who said a solemn mass in the cathedral church of Santa Maria del Fiore, that is to say Santa Liperata”.

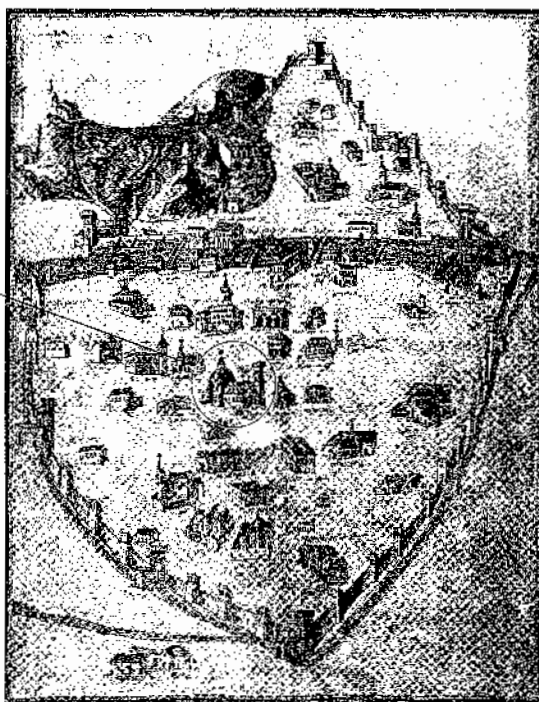
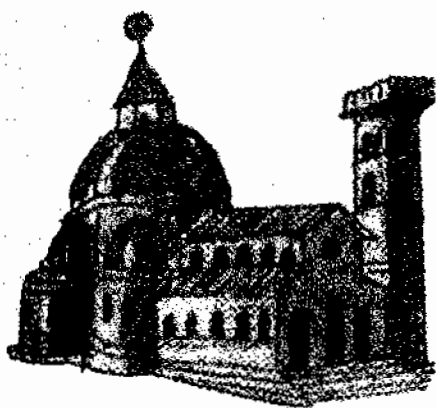


fig. 113 Florence in a 15th century map showing the city's principal buildings. Near the top can be seen the cathedral, called S.Maria del Fiore since the end of the 14th century, but still referred to as S.Reparata in the earthquake historical sources, that being its earlier name (Biblioteca Apostolica Vaticana, *Vaticani Latini*, 5699, fol.126v).

Venerdì a dì 28 di settembre a hore cinque e mezzo di notte venne uno grandissimo tremuoto nella nostra città di Firenze et contado che nella detta città chaddono più di mille chammini et dimosse molti luoghi e molte mura et difici et fu sì terribile chelle case sabandonorono et andavano a dormire su pelle piazze et negli orti. Et fu per questo hordinato da monsignore arciveschovo di Firenze 4 dì sandasse a processione con grandissima quantità di donne et huomini et di battuti et durorono detti tremuoti insino a dì 29 doctobre che venivano molto ispesso. Et di poi durorono parecchi mesi che non venivano sì spesso et insino a dì 29 dottobre e signori non dormivano in palagio et se vi dormivano dormivano per le finestre. El primo tremuoto che venne sonorono tutte le champanelle picchole di palagio et molte case rovinorono del nostro contado per modo che gli era uno isbighottimento assentire. Et arestati e tremuoti per tre dì si misse sì terribili venti per modo fecion tremare tutte le case che gli huomini antichi dicevano non avere veduto mai più si fatta cosa et per detta cagione e dieci della balya instantiorono lire mille e qua danari fecion dare per lamore di Dio et che preghassino Iddio ci donassi gratia di concederci buona pace et levarci questa influença da dosso.

Et per questi sospetti molti huomini et donne si confessorono et comunichorono et molte limosine si fecero per la terra da privati cittadini. Et illutimo di della processione vando la signoria con tutti gli ufici et monsignore larciveschovo lo quale disse una solenne messa in nella chiesa maggiore di Santa Maria del Fiore cioè di Santa Liperata.

An anonymous *Nota* concerning the 1453 earthquakes (Biblioteca Nazionale Centrale, Florence, II, IV, 128, fol.104) provides information not only about Florence but also about damage at Bagno a Ripoli and Camerata:

"In the year 1453 during the night of 28-29 September, between the fifth and sixth hours, a very great earthquake struck the city of Florence, and many said that the shaking of buildings lasted as long as it takes to say a Hail Mary, but in my opinion it was not as long as that, because I think few buildings would have remained standing — and the earthquake was quite terrifying and indeed many chimneys fell to the ground and at Bagno a Ripoli where the sons of Cino di messer Francesco Rimugni

lived, part of a tower and other buildings collapsed, thereby causing them great harm. At Camerata, where Chimento di Stefano lived next to Bartolo di Domenico Corsi, part of the building collapsed, and so in many places round about it did great harm, less to some and more to others, and some children were killed at Camerata; and then in October there was another [earthquake] at about the first hour of the night, but it was not so violent, and between 29 September and the above-mentioned month of [October] there were numerous slight earthquakes. For that reason, many people made themselves shelters outside their houses, in the open, in squares and out in the fields and for many it was a very frightening and terrifying experience. Many pieces of stone collapsed from the vaulted roof of Santa Liperata, that is to say from the corners of the aisle alongside the priests' house, and many other church buildings were damaged but none collapsed, and the occurrence was considered a great miracle since the earthquake was so violent; but by the grace of God the earthquakes came to an end".

Insino l'anno Mille quatrocento cinquantatre adi xxviii di settembre, la notte tralle cinque ore elle sei vegne[n]te di xxviii venne nella cipta di Firenze uno tremuoto grandissimo et per molti si disse che lo scrollamento d'edifici basto quanto si penerebbe a dire una avemaria ma sechondo me [...] non duro tanto perche credo che pochi edifici si difenderebano a rimanere impiede basta[n]do tanto ma quello sisia et fu terribilissimo in forma che più chamini per la terra chascharono et al Bangno a ripoli ove al luogho de' figliuoli di Cino di messer Francesco Rimunni, chadde parte d'una torre e altri edifici in modo fue con loro grandissimo danno. In Chamerata il luocho fu di Chimento di Stefano, allato al luogo di Bartolo di Domenicho Chorsi chascho parte desso et chosi in molti luoghi intorno alla terra fece moltissimi danni a chi pochi e a chi assai et alchuni fanciugli in Chamerata morirono. Et di poi a di d'ottobre ne venne uno altro circha a una ora di notte ma non fu si gra[n]de et chosi tra di 29 di settembre et sopraddetto ne venne molti picholi in modo che per molti si feciono allogamenti fuori dalle chase cioè nella terra in sulle piazze et di fuori per campi et per chorti fu una chosa molto spaventevole e d'averne grandissimo tremore. Chaddono più pietre delle volte di Santa Liperata cioè degli spicholi della nave lungho la chanonicha de' preti et molti altri edifici di chiese aprirono ma nessuno ne chaschè afatto che fu tenuto grandissimo miracholo sendo tanto grande ora Idio per sua grazia che cessò.

The shock referred to in the previous source can be estimated to have lasted 7-8 seconds (Ferrari and Marmo 1985). Other details about Florence are recorded in an anonymous *Priorista* (Archivio di Stato, Florence, *Carte Stroziane*, Serie II, 103, fols.135v.-136r.):

"On Friday 28 September 1453 between the fifth and sixth hours of the night some earthquakes occurred at Florence, and they were so terrible that according to elderly people there was no greater in living memory, and there was very considerable damage and a great many chimneys collapsed and many roofs and house walls, and in the *contado* it caused much damage at San Benedetto outside the gate, and two children of Cristofano di Piero died because the tower collapsed on top of them as they slept and it caused great damage at San Gallo and elsewhere it caused harm to persons and property. Then on Saturday [29 September] there were further shocks and in about a month and a half came many more which were not very violent and caused no damage, thank God".

A di 28 settembre 1453 in venerdì a ore 5 di notte vegnente le sei vennono in Firenze tremotti e furono tanto terribili che a detto di veruno antico non si ricorda il maggiore e fu grandissimo danno e numero infinito di camini caddono e molti tetti e mura di case e pel contado fé molti danni da San Benedetto fuori della porta morì due figlioli a Cristofano di Piero dell'opera e rovinò loro la torre addosso sendo a dormire e in San Gallo fé gran danno e in molti altri luoghi e a più persone, di poi il sabato [29 settembre]

ne venne di nuovo e in circa a mesi uno e mezzo ne venne molti non troppo grandi e non feciono danno Iddio lodato.

Another anonymous *Priorista* dwells in addition on damage caused by very strong winds after the shocks (Biblioteca Riccardiana e Moreniana, Florence, *Manoscritti Moreniani*, 277, fol.200):

"On 28 September [1453] at the fifth hour, very great earthquakes struck [Florence] and many others followed for a period of a month, so that many townspeople and others abandoned their houses and dwelt in the squares. Then came very strong winds which reduced to ruins many houses outside the city, towards Impruneta".

Adì 28. di 7bre a' hore 5. vennono grandissimi Tremuoti et di poi per un mese ne vennono molti altri di modo che molti Cittadini et altra gente abbandonorono le case et albergavano per le piazze. Di poi vennono grandissimi venti che gettò in terra di molte Casa fuora della Città verso l'Impruneta.

The earthquake is also recorded in published contemporary sources which add to our picture of effects. Sozomeno da Pistoia, a humanist and expert in canon law, tells us that there were some victims outside the Pinti gate, which no longer exists, but stood in the north-east part of the city walls:

"There was a great earthquake in Florence on 28 September at the fifth hour of the night in that year [1453], and many chimneys collapsed and walls split open. Consequently, the whole city of Florence was thrown into confusion and so nearly all the people spent the night in the street and four prayer sessions were ordered. And some people were killed when walls collapsed as they lay in bed outside the Pinti gate, and indeed the earthquakes lasted for many days".

Terremotus magnus Florentie fuit die XXVIII septembris hora quinta noctis dicti anni, et multi camini elapsi et muri aperti fuerunt; qua de re tota civitas florentina submota fuit, et quasi omnis populus deinde in viis publicis pernoctabant, et supplicationes quattuor indiete sunt. Et aliqui etiam propter murorum lapsum mortui sunt in lecto dormientes extra ianuam Pinti, nam multos dies frequentarunt terremotus.

Antonino Pierozzi, who was then archbishop of Florence, wrote:

"An earthquake also occurred at Florence three years earlier [in 1453], for on the last day but one of September at the fifth hour of the night it shook all the buildings and was accompanied by a considerable noise, and since it split open some walls, it produced the fear and threat of a disaster. It was therefore necessary to spend a great deal of money in order to reinforce some buildings. There were only two victims among the populace. The event did not cause any building in or outside the city to collapse, except for some upper parts, such as some chimneys and some of the battlements on *palazzi*. The earthquake extended for about 12 miles around Florence. During the following days, there were more shocks during the night, at dawn or during the day, but they were slight and did not cause damage".

Terremotus quoque acciderat Florentie, per annos tres antea, penultima Septembris, hora V noctis, vehementer commovens hedificia cuncta cum sonitu non parvo, quod eciam parietes aliquantulum aperiens, magnam debilitationem et comminationem ruine induxit, unde oportuit multa expendere ad fortificationem hedificiorum multorum; nullus ex eis mortuus est, nisi duo ex aliqua ruina; hedificium pene nullum cecidit in civitate vel extra, nisi aliq̄ue extremitates in summo, ut emissoria fumi ex caminis et merli palatiorum aliqui. Extensus fuit terremotus ille circa XII miliaria circumcirca Florentiam. Aliis quoque diebus sequentibus in nocte vel diluculo vel infra diem acciderunt, sed modici et nullam lesionem operantes.

In Filippo Rinuccini's *Ricordi storici* we find further details about damage at Florence:

"Earthquakes. On 28 September 1453 at about the fifth hour of the night very great earthquakes occurred at Florence and in the *contado*. First of all there was a very violent and lengthy shock, followed by two more, and they did great damage in the city and *contado* of Florence, especially in the *contrada* of S.Gallo and at Camerata. In the city and the *contado*, the earthquake damaged many chimneys, houses and other buildings, to a total cost of more than one hundred thousand florins between city and *contado*, we are told; and it went on for a month and a half, and every now and then there was one shock or more, on and off, until February 1453 [Florentine Incarnation style; 1454, modern style], but they were weak".

Tremuoti. A dì 28 di Settembre 1453 vennono in Firenze e nel contado grandissimi tremuoti; e fu detto di a ore 5 di notte o circa, prima uno grandissimo e sterminato, e poi due altri, e feciono grande danno nella città e contado di Firenze, e massime nella contrada di San Gallo e in Camerata; e rovinò nella città e contado molti cammini e delle case e edifici, in modo che si dice piggiorò la città e il contado più di fiorini centomila; e di poi durò un mese e mezzo, e quando ne veniva uno e quando un altro, e vennene insino di Febbraio 1453, ora uno e ora un altro, ma piccoli.

The chronicler Domenico Buoninsegni reports damage at Vincigliata, a locality not mentioned in the previous sources:

"On Friday night, 28 September [1453], at about the fifth hour, there was a great earthquake in Florence and the *contado*, and it lasted as long as it would take to recite the Lord's Prayer twice, and it was one of the greatest that could be recalled for a long time. Many chimneys collapsed, and it caused large cracks in many houses and other buildings, and it so frightened everybody that many left their houses and stayed out in the squares. It did most damage in certain parts of the *contado*, especially towards Vincigliata, and that same night and for four days afterwards there were many other shocks, but they were much less severe. Many processions were held in this connection".

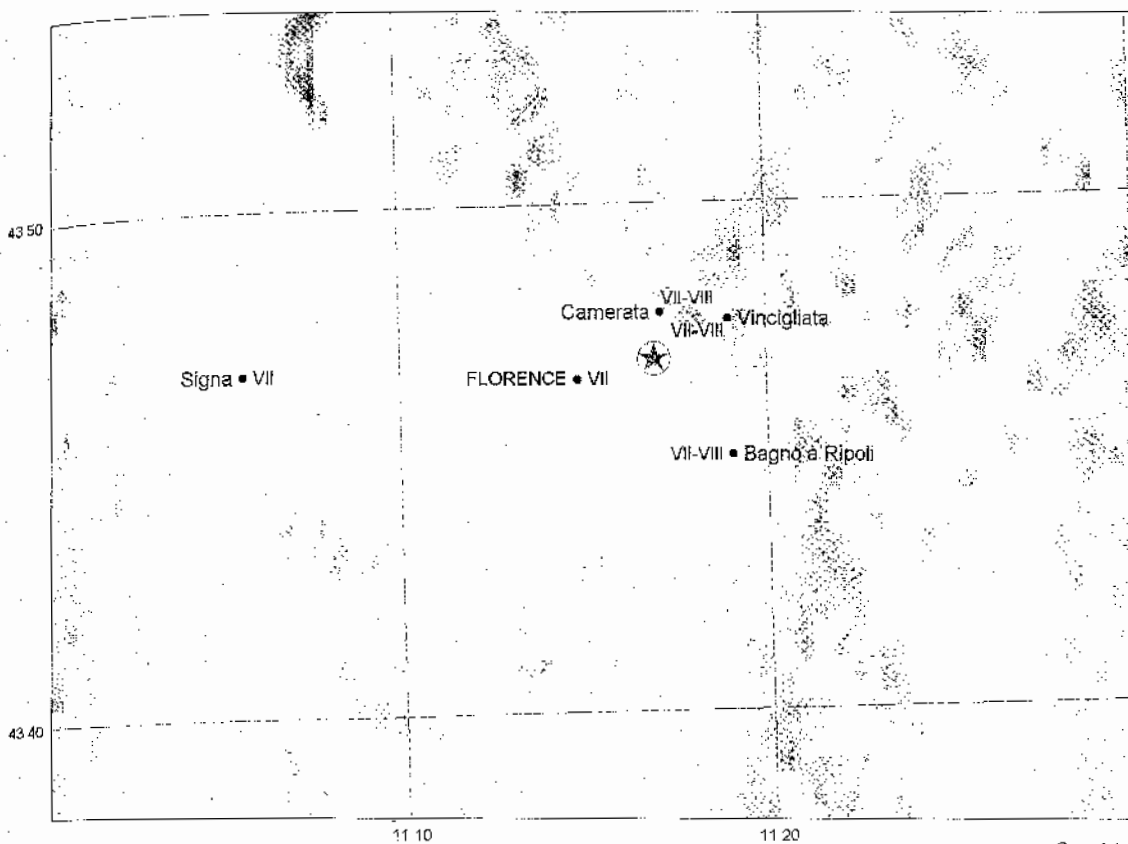
Venerdì notte a dì 28 di settembre circa a hore cinque fu in Firenze, e nel contado un gran tremoto, e durò circa al dire di due padrenostri, e fu de' maggiori, che ci si ricordi di esser suto già è gran tempo, caddono molti cammini, e a molte case, e edifiçi fece gran crepature, e spaventò si ogni persona, che molti s'uscirono dalle case, e stavano in su le piazze: fece maggior danni in alcuni luoghi del contado, e massime verso Vincigliata, e nella medesima notte, e in quattro giorni doppo ne vennono più altri, ma assai minori: fecionsi per quest'occasione molte processioni.

The shock reported by Buoninsegni is estimated to have lasted about 25 seconds (Ferrari and Marmo 1985). This seismic event is also mentioned in contemporary Bolognese chronicles: the *Cronaca Varignana* and the *Cronaca Rampona* record three shocks: on 28 and 30 September and 1 October 1453. We set out below the text of the *Cronaca Varignana* (vol.4, p.194), because it records damage to Palazzo Vecchio – a detail which does not appear in the other sources:

"Of an earthquake which occurred at Florence. 1453 – On 28 September between the 4th and 5th hours of the night, there was an earthquake in the city of Florence which caused many chimneys to fall down and inflicted great damage at the 'palace of the lords' [Palazzo Vecchio or Palazzo della Signoria]. These earthquakes occurred three times, that is to say on 28 and 30 [of September] and on the first day of October; and they severely frightened the people of the city".

D'un tremoto che vene in Fiorenza. 1453 – In la città de Fiorenza fuo uno tremoto adi 28 de setembre tra ore 4 e 5 de note, el quale feze chaschare molle fughe de chamini et feze gran dano nel palazo di signiuri. I quali tremoti fono tre volte, zoé adi 28 e adi 30 e adi primo de otobre: et feze grandisima paura al dito populo.

Amongst 18th century works of crude historiography, we may mention that of Richa



1453
September 28

0 9 km

fig. 114

(1758, vol.7, pt.3, p.126), who reports that the walls and roof of the library in the convent of S.Marco in Florence were badly damaged in the earthquake, and that in 1457 the prior of the convent had restoration and extension work carried out. In a study of the earthquake which struck Florence in 1895, Bassani (1895, p.51) suggests that the heavy chains on the tower next to Palazzo Vecchio were probably put there after damage suffered in the 1453 earthquake.

▲
1453 09 28 22:45 UT ★ = 43 47 11 17 $I_0 = VII-VIII$ $M_c = 5.4$ Sites: 5

localities	lat.	long.	I	localities	lat.	long.	I
Bagno a Ripoli	43 45	11 19	VII-VIII	Florence	43 47	11 15	VII
Camerata	43 48	11 17	VII-VIII	Signa	43 47	11 06	VII
Vincigliata	43 48	11 19	VII-VIII				

1453 09 29 - 1454 05 more aftershocks in Florence

< 305 > 1454 summer Constantinople [north-western Turkey]

source [Sphr.], *Chron. Maius*, p.516

catalogues d. Schmidt (1881); Dück (1904); Downey (1955); Grumel (1958); Evangelatou-Notara (1993)

In the summer of 1454, there was a sequence of slight earthquake shocks at Constantinople (now Istanbul), lasting for 18 days.

Information about this sequence is preserved in the *Chronicon Maius* of Pseudo-Sphrantzes, the name given to a 16th century reworking, by the metropolitan Makarios

Melissenos, of information which probably derives in part from Sphrantzes himself. The chronological context is that of a series of prodigies which occurred at Constantinople in the summer of the year of the world 6962 [1 September 1453 – 31 August 1354], when it was occupied by the Turks. Amongst these prodigies: “In the morning there were some slight earthquake shocks, lasting for eighteen days”.

τῷ δὲ πρωῖ σεισμοὶ τινες ἑλαφροὶ ἐγίνοντο ἐπὶ ἡμέρας δέκα καὶ ὀκτώ.

Further on (p.520), Pseudo-Sphrantzes comments on the various prodigies, including a paragraph with a partly religious and partly naturalistic explanation of seismic phenomena. Dück (1904, pp.134-5), wrongly dates these earthquakes to 1470.

▲ 1454 summer sequence lasting for 18 days

localities	lat.	long.	I
Istanbul	41 02	28 57	III-IV

< 306 > **1455 February 6 Middle Reno Valley [northern Italy]**

sources 1	[manuscripts] BCABo, <i>Mss.</i> , B.1648; Giacomo di Marco, <i>Cron.</i> ; <i>Cron. Ramp.</i> , IV, pp.232-3; <i>Cron. Varign.</i> , IV, p.232
sources 2	BUBo, <i>Mss.</i> , 429, Cattani, <i>Cron.</i> , fol.83v; BCABo, B.3454, <i>Cron.</i> , fol.23v; Ghirardacci, <i>Della hist.</i> , p.153
literature	Guidoboni (1997); Guidoboni and Ciuccarelli (2003a)
catalogues d.	*Boschi <i>et al.</i> (1995, 1997, 2000)
catalogue p.	CPTI (1999)

This earthquake is mentioned only in the most recent catalogues (Boschi *et al.* 1995, 1997, 2000) and studies (Guidoboni and Ciuccarelli 2003a), being unknown to previous seismological studies.

On 6 February 1455, an earthquake struck the Tusco-Emilian Apennines, along the middle valley of the river Reno, causing many houses to collapse and creating panic amongst the inhabitants, who took to flight. In less than an hour, there were numerous aftershocks.

Three reliable contemporary sources record this earthquake, namely the two published 15th century chronicles known as the *Cronaca Rampona* and the *Cronaca Varignana*, and the unpublished *Cronaca* by Giacomo di Marco, a Bolognese barber who was born in 1440 (Biblioteca Comunale dell'Archiginnasio, Bologna, *Manoscritti*, B.1648). In the first of these, we read:

“There was an earthquake on 6 February [1455] in the mountains of Bologna, that is to say the valley of the Reno. It caused many houses to collapse in the valley concerned, and struck fear into everyone, because there were several shocks in less than an hour”.

Uno tremoto fu adì sei de febraro nella montagna de Bologna, zoè per Val de Reno; per lo quale tremoto molte chaze chadeno a terra nella dicta valada, et fece paura a zascuna persona, però che li fu più volte in pocha d'ora.

The second source provides the same information. The information provided in the manuscript *Cronaca* by the barber Giacomo di Marco is briefer:

“On 6 February [1455] there was an earthquake which caused many houses to collapse”.

Edì 6 febraro vene uno taramoto p[er] lo quale taramoto ruino de molte case.

A further detail, however, is recorded in the third part of the *Della historia di Bologna* by the Augustinian monk Cherubino Ghirardacci, a reliable 16th century Bolognese scholar and historian:

"On 6 February [1455], a Thursday, there was a great earthquake in the Reno valley, which caused many mountain dwellers to flee, fearing that the end of the world had come, and many houses collapsed to the ground".

A dì 6 di febbraio, il giovedì, fu gran terremoto nella valle di Rheno, per il quale molti montanari si posero in fuga, dubitando che fosse venuta la fine del mondo, et caddero molte case a terra.

6 February was indeed a Thursday in 1455. The river Reno rises at Le Piastre, a locality in the present-day province of Pistoia in Tuscany, and its valley extends for about 60 km to the SSW of Bologna. In Boschi *et al.* (1995, 1997, 2000), information about this earthquake is to be found in the entry for the earthquake of 20 December 1455 which struck the same area (see below).

▲ 1455 02 06

localities	lat.	long.	I
■ Middle Reno valley	44 20	11 11	VIII

< 307 > 1455 March 6 Cairo [Egypt]

source 1 Ibn Taghribirdi, *Hawadith*, VIII/2, p.225
 source 2 Ibn Iyas, *Badai'*, II, p.323
 catalogue d. *Ambraseys *et al.* (1994)

On 5 March 1455, a minor earthquake shook Cairo and its suburbs a number of times. A few days later, during the night, there was another, slighter shock. Information about the earthquake can be found in the work of Ibn Taghribirdi, a contemporary Arab historian:

"On that day (16 *Rabi' I* = 6 March), there was a slight earthquake at new Cairo and its suburbs, which caused the ground to shake several times; then, a few days later (the earthquake) came back during the night in a slighter form than the first time".

و فيه كانت بالقاهرة و ضواحيها زلزلة خفيفة تحركت الارض منها غير مرة ثم بعد
 ليام عادت في الليل اخف من الاولى .

Ibn Iyas writes:

"In that month (*Rabi' I* = 19 February – 20 March), an earthquake struck new Cairo, but it was slight, and it took people some days to return (to their homes)".

و فيه حدثت زلزلة بالقاهرة، و كانت خفيفة، و استمرت تعاود الناس أياما.

Ambraseys *et al.* (1994, p.102) date the earthquake to 5 March and give it an epicentral intensity of class F, which is equivalent in their classification to a range from felt to strong (up to grade VI MSK).

▲ 1455 03 06

localities	lat.	long.	I
Cairo	30 03	31 15	IV-V

< 308 > 1455 December 20 Middle Reno Valley [northern Italy]

sources 1 [manuscripts] ASBo, *Demaniale*, S.Procolo, 273/5491, no.39, Petition, 1455; no.55, Indulgence, 3 July 1456; BCABo, *Mss.*, B.1648, Giacomo di Marco, *Cron.*; BCMn, *Mss.*, 1022 I.I.5, *Libro*, fol.25;

- Nadi, *Diario*, pp.34-5; Albertucci de' Bors., *Cron.*, p.92; *Cron. Ramp.*, IV, p.240; *Cron. Varign.*, IV, p.241
- inscription graffito on the walls of the loggia at the castle of Montechiarugolo, in Dall'Acqua (1976, p.72) and Fiorini (1993)
- sources 2 BUBo, *Mss.*, 429, Cattani, *Cron.*, fol.85v; *Mss.*, 581, A. delle Anelle, *Diario*, fol.80v; *Mss.*, 294, Bianchini, *Cron.*, fol.76v; *Mss.*, 430, Ubaldini, *Cron.*, II, fol.588v; *Mss.*, 1438, Delle Tuato, *Sustanziosa*, fols.185r, 186r; *Mss.*, 1439, Delle Tuato, *Hist.* II, fol.323r; *Mss.*, 1410, *Storia*, fol.47v; AConvSDom, Bologna, *Mss.*, 32900, Prélormo, *Chron.*, fol.71r; BCABo, *Mss.*, B.3454, *Cron.*, fol.23v; *Mss. Gozzadini*, 152, Pasi, *Cron.*, fols.4r-5v; ASBo, *Demaniale*, S.Procolo, 258/5476, *Notizie*, fols.382-3; BConvSFRancesco, Bologna, 35, Bottrigari, *Ricordi*, fol.275v; BEUMo, *Mss.*, c.H.3.1, Dal Poggio, *Istoria*, fol.569v; Ghirardacci, *Delle hist.*, p.161
- historiography BUBo, 770, Ghiselli, *Mem.*, 18th c.; Faleoni (1649); Zucchini (1939); Dall'Acqua (1976); Fiorini (1993)
- literature Camassi and Molin (1994); Guidoboni (1997); Guidoboni and Ciuccarelli (2003a)
- catalogues d. Perrey (1848); Mallet (1853); Mercalli (1883); De Rossi (1889); Baratta (1901); Milne (1911); Guidi (1915); *Boschi *et al.* (1995, 1997, 2000)
- catalogues p. Giorgetti and Iaccarino (1971); Carrozzo *et al.* (1973); Postpischl (1985); CPTI (1999)

On 20 December 1455 at 20:45 UT (half-way through the fourth hour of the night, "Italian time"), a strong earthquake struck Bologna, the surrounding countryside and the mountains near Bologna, where many churches were damaged. Two further shocks were felt in Bologna during the night: one at 21:45 UT on 20 December (half-way through the fifth hour of the night, "Italian time"), and the other at 1:15 UT on 21 December (during the ninth hour, "Italian time"). In Bologna itself many chimneys and parts of walls collapsed, and there was serious damage at the building complex of the church of the Madonna del Monte outside Porta S.Mamolo — now absorbed into Villa Aldini, which stands on one of the hills overlooking the old city centre. Perhaps partly because of the age of the building, the church tower collapsed almost completely, and in falling, it destroyed part of the church, smashing almost all the statues inside. The tower was later rebuilt. The upper part of the sacristy and the chapel of the Blessed Virgin also partly collapsed. The latter was demolished and later rebuilt. Various cracks and lesions also affected the rest of the building, and it was estimated that repairs to the church would cost more than one thousand *lire*. The shock also broke the keys of the Ospedale della Morte (which now houses the Museo Civico Archeologico). The earthquake was felt so strongly at Montechiarugolo, near Parma, that its inhabitants were struck with fear. The strongest shock was also felt in Mantua and Lucca, though without damage being caused there. In Lucca it lasted only a short time.

The sources for this earthquake are two documents and many contemporary Bolognese chronicles. In the Archivio di Stato in Bologna, we tracked down some interesting unpublished documents which provide a detailed understanding of seismic effects on the building complex of the church of Madonna del Monte. In the collection entitled *Demaniale*, consisting of documents produced by religious congregations suppressed during the Napoleonic period, there are some items produced by the monastery of S.Procolo (273/5491, 1448-1456, no.39, no.55), which was responsible for the administration of the church of Madonna del Monte. In this collection were found a petition to pope Calixtus III (1455-1458) for a contribution towards rebuilding the church tower, and an indulgence granted by the legate in Bologna to benefactors of that church. In the same collection we also found a group of 17th century memoirs in thirteen fascicules, in which reference is made as to how the restoration of the church was carried out (258/5476).

This earthquake is recorded in many contemporary Bolognese chronicle sources, such as the diary of Gaspare Nadi, a Bolognese master mason who experienced the earthquake himself; the chronicle of Girolamo Albertucci de' Borselli, a Dominican preacher; the two

chronicles known as the *Cronaca Rampona* and the *Cronaca Varignana*, and the unpublished chronicle by Giacomo di Marco, a Bolognese barber who was born in 1440 (Biblioteca Comunale dell'Archiginnasio, Bologna, *Manoscritti*, B.1648). Amongst 16th century chronicles, we would mention those of Friano Ubaldini (Biblioteca Universitaria, Bologna, *Manoscritti*, 430), a haberdasher; Ludovico da Prelormo (Archivio del Convento di S.Domenico, Bologna, *Manoscritti*, 32900), a Dominican (both of these are manuscript), and the third part of the *Della historia di Bologna* by Cherubino Ghirardacci, an Augustinian monk.

There is a petition which, though undated, must have been drawn up in the closing days of 1455 or shortly afterwards, and in which the monks of S.Procolo asked pope Calixtus III (1455-1458) for a contribution of at least 100 *lire* towards the cost of repairing and restoring the building complex of Madonna del Monte, together with exemption from duty on wine and other taxes, in order to reach the total of more than 1,000 *lire* which was reckoned necessary to carry out the work (Archivio di Stato, Bologna, *Demaniale*, S.Procolo, 273/5491, no.39). Here is that part of the document which describes the effects of the earthquake:

"Holy Father, since, as a result of the terrible earthquakes which have in recent times struck this your city of Bologna and its surroundings, almost all the holy bell-tower of the church of Santa Maria in Monte in this city collapsed and, as it fell, destroyed that part of the church containing the revered and holy sepulchre of Our Saviour, and completely smashed almost all the statues there, causing great damage and harm to the church, and since this place, where the people of Bologna and the surrounding area gather daily with great piety, is such that it seems well nigh impossible to carry out the necessary repairs in any other way, the venerable monks of the church of S.Procolo of this city, who are responsible for the said church, being evidently quite unable to do so themselves, and since it is established that more than one thousand Bolognese *lire* are required for indispensable repairs".

*Forma satis brevis supplicationis porrigende Sanctissimo Domino Nostro
Beatus Pater Cum ob terribiles Terremotus, qui proximis temporibus fexunt in hac
vestra Civitate Bononie, et in partibus circumstantibus, Corruerit quasi totum
Campanile devotissime Ecclesie Sancte Marie In Monte Civitatis eiusdem, Et in sui
Ruina demoliverit eam partem dicte Ecclesie, In qua erat Noster Salvatoris devotum et
Solempne Sepulcrum, Et statuas ibidem existentes, quasi omnes contriverit In totum,
In magnum dicte Ecclesie detrimentum et defformitatem non paucam, Cumque locus
Ille sit, ad quem cum summa devocione, Et per universum Bononiensem populum, Et
per omnes circumstantes partes cottidie concursus habetur, ut sic satis detestabile
videatur, ad praedictorum necessariam reparationem non aliter provideri, Ad cuius
reparationis expensam Venerabili Religiosi Ecclesie Sancti proculi Civitatis eiusdem
Sub quorum Commendabili Gubernatione praefata Subest Ecclesia penitus impotentes
esse nottorie dignoscuntur, Attento maxime quod ad praedictorum necessariam
reparationem mille libre Bononinorum et ultra non sufficerent.*

On 3 July 1456, Ludovico Trevigiano, the bishop of Bologna, granted a two year indulgence to all those who made offerings towards the restoration of the church (Archivio di Stato, Bologna, *Demaniale*, S.Procolo, 273/5491, no.55). Here, too, we give only that part of the document which describes the effects of the earthquake:

"Since, on account of the destructive effects of age on all things as well as the unusual and extraordinary earthquakes, the holy temple of S.Maria in Monte outside the walls of Bologna is in danger of collapse because of the evident cracks and persistent damage, and indeed not many days ago the bell-tower of the church collapsed, as well as part of the chapel containing the holy image of the Glorious Virgin, and the whole height of the sacristy [...]. Given in Bologna, at the palace in which we reside, in the year of Our Lord 1456, on 3 July, in the second year of the reign of pope Calixtus III".

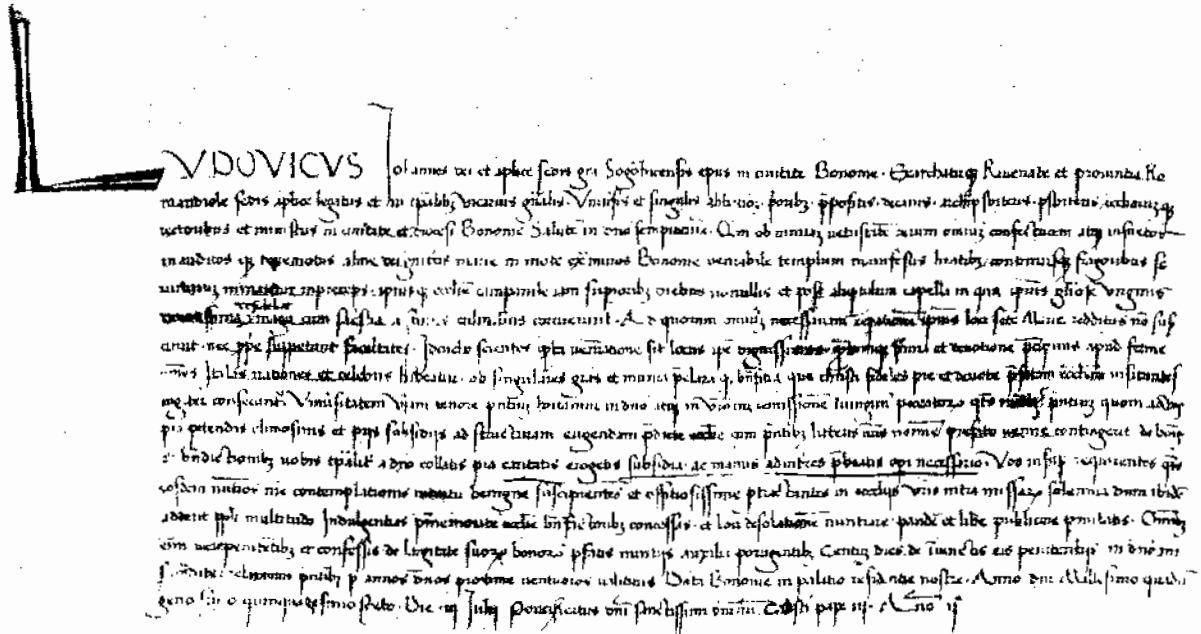


fig. 115 Parchment dated 3 July 1456: in it the bishop of Bologna, Ludovico Giovanni Trevigiano, grants indulgence to those making contributions to the repair of the Bologna church of S.Maria del Monte, which was damaged in the earthquake of 20 December 1455 (Archivio di Stato, Bologna, Demaniale, S.Procolo, 273/5491, no.39).

Quoniam ob nimiam vetustatem rerum omnium confectricem atque insuetos inauditosque terremotus alme dei genitricis marie in monte extra muros Bononie venerabile templum manifestis hiatibus continuousque fragoribus se ruiturum minatur inpreceps, ipsiusque ecclesie campanile iam superioribus diebus nonnullis et post aliquantulum capella in qua ipsius gloriose Virginis devotissima residebat imago cum sacristia a summis culminibus corruerunt, [...] Data Bononie in palatio residentie nostre. Anno domini millesimo quodringentesimo quinquagesimo sexto. Die iij Julij pontificatus domini sanctissimi domini nostri Calisti pape III anno II.

We know from a 17th century document (Archivio di Stato, Bologna, Demaniale, S.Procolo, 258/5476, 1448-1795) that on 20 May 1456, the monks of S.Procolo and the officials of the fabbrica of S.Maria del Monte entrusted to master masons Santino di Pasetto and his son Pasi the task of rebuilding the church bell-tower and demolishing and then rebuilding the chapel of the Blessed Virgin.

In Gaspare Nadi's diary, we read:

"Memoir of the earthquakes. On 20 December 1455 there were tremendous earthquakes in Bologna and elsewhere, and they were so violent half-way through the fourth hour that the tower of the church of Santa Maria del Monte collapsed, and many chimneys fell down in the territory of Bologna, where there are some localities with well-built houses, and the keys of the Ospedale della Morte broke, and many pregnant women miscarried. [The earthquakes] were so powerful that I think that but for the holy bodies in the churches in this territory, it would certainly have been destroyed. The Lord be praised always".

Rechorde di li taramoti chome adì 20 de dessembre 1455 fo in bolognia e in altri luogi asae grandinisimi taramoti per modo e tale che a le hore 4 e 1/2 fono tamanti che chadè el champanile de la chiessia de madona santa maria dal monte e de monte chamini per la tera de boni luogi e bone chasse e ropesse le chiave del spedale de la morte e desperdè de monte done grose fono tamanti che credo che se non fosse li chuurpi santi che sono in le chiessie de questa tera certamente seria aporfondada. Ydio sia sempre lodato.

Girolamo Borselli's report is very brief:
"The year of Our Lord 1455. [...] The earthquake knocked the campanile of Santa Maria del Monte down to the ground as well as many chimneys in Bologna".

Anno Domini 1455. [...] Terremotus campanile Sancte Marie in Monte et multa fumantia Bononie ad solum deiecit.

Giacomo di Marco's note is equally brief:

"1455 There was an earthquake in Bologna on the night of the feast of St. Thomas, half way through the 4th hour of the night, half way through the 8th hour and at the 9th hour, the three shocks causing great damage in the city".

1455 Vene uno taramoto in bologna la note de santo maxe a ore 4 1/2 de note et a ore 8 1/2 et a ore 9 tre 3 volte e fe gran dani in bologna.

The *Cronaca Rampona* also refers to damage to churches in the Bolognese mountains — probably the same area along the middle valley of the river Reno which had previously been affected by the earthquake of 6 February 1455 (see entry < 306 >):

"1455. [...] On 20 December there was a great earthquake in Bologna and its *contado*: half-way through the fourth hour of the night, on a Saturday, the eve of the feast of St. Thomas. The earthquake struck fear into everyone who felt it. First of all there was a loud noise, and then all the buildings began to shake, and it brought down many chimneys on houses, as well as some stretches of wall, and the bell-tower of S. Maria del Monte collapsed, that is to say the pinnacle roof and the bells and half the bell-tower; and many churches in the Bolognese mountains suffered damage. The earthquake struck three times during that one night, that is to say, half-way through the fourth hour, half-way through the fifth hour and at the sixth hour".

1455. [...] Adì XX de desenbre fu uno gran taramoto in Bologna et in lo contado, a hore quatro e mezo de nocte, in sabato, la vigilia de misser sam Tomaso; el quale fece paura a zascuna persona che lo udì. Et prima venne cum uno strepito, poi cominzò a scossare ogni edifizio fortemente, et fece chaschare molti camini da fuogho in sulle chase, et alquante sponde de muro, et chadde el canpanile de madonna santa Maria dal Monte, zoè el capelo e le canpane cum la mità del canpanile; et molte chiesie de la montagna de Bologna ebbeno danno. El quale tremoto venne tre volte in questa nocte, zoè a hore quatro e mezo cinque e mezo et sei.

20 December was indeed a Saturday in 1455, and the feast of St. Thomas was celebrated in the West on 21 December. The same information is to be found in the *Cronaca Varignana*.

The information about Montechiarugolo, which lies about fifteen kilometres south east of Parma, is to be found in Guidoboni and Ciuccarelli (2003a, pp.45-7), and derives from:
■ — a graffito engraved on the wall of the loggia at the castle of Montechiarugolo. Although the text presents various problems of interpretation, especially as regards chronology, we think it may refer to the earthquake of December 1455. The text we have to consider is that first published by Dall'Acqua (1976) and later by Fiorini (1993), since a direct examination of the loggia wall has shown that the inscription itself is no longer identifiable (Guidoboni and Ciuccarelli 2003a, p.46). In the text transcribed and published by Dall'Acqua (1976), variants are given in round brackets:

"In the year of Our Lord 1444, on 26 December at the fourth hour of the night, there was here [at Montechiarugolo] and in the surrounding area such an earthquake that [...] the tower of Santa Maria in Monte and in the midst [...] in Tuscany and with a single shock it sent chimneys near the city of Bologna crashing to the ground; although its stonework is wonderfully well held together, this castle and its tower shook so badly that the shocks frightened everyone who was there and prevented most of them from sleeping in their beds".

Anno Domini 1444 vigesimo sesto decembris hora quarta noctis fuit hic et locis circumvicinis (cercomvicinis) terremotus ita ut semonte turrim Sancte Marie in Monte medioque [...] ([...]bam) calabrem [...] in Tuscia et caminos circa ville civitatis Bononie

stravit per terra unico moto suo, non obstante mira lapidum cogent ista rocha una cum sua turri tremit ut tremita pavide omnes in es (ea) existentes terrendo ita a lecto plures prohiberunt soporati.

The first problem posed by this text is one of chronology: 26 December 1444 could have been the date of an earthquake not known to Italian catalogues, if the inscription had simply referred to effects at Montechiarugolo. But the subsequent information takes us to geographical areas where the earthquake had different effects. First comes the tower of S.Maria in Monte. Although it is mentioned within a defective sentence, the reference seems nevertheless to be to the bell-tower of the Santuario of Madonna del Monte in Bologna: chronicle sources and two church documents record that it partially collapsed as a result of the earthquake of 20 December 1455. Perhaps the most important item of information, however, concerns effects at Bologna: we are told that the earthquake of 1455 caused chimneys to collapse near the city, and the chronicle sources confirm such damage both in the urban area and the *contado*, that is to say the rural areas closest to the city. As for the year 1444 — written in Arabic numerals — it could well be an error of transcription, since the figure 'five', as written in the 15th and 16th centuries, is very similar to 'four'. That the day of the earthquake is given as 26 instead of 20 may be the result of a lapse of memory on the part of whoever wrote the inscription, since it was very probably incised at least some weeks after the earthquake, that is to say long enough afterwards for news of its being felt or causing damage to reach Montechiarugolo. The time of the earthquake is given in "Italian" time as the fourth hour of the night, which more or less agrees with the time of the earthquake of 20 December 1455 as it appears in Bolognese chronicles ("half way through the fourth hour") and those of Tuscany ("a quarter of the way through the fourth hour").

There is also information to the effect that the earthquake was felt in Mantua and Lucca as well. There is also a reference to this earthquake in the *Libro delle cronache di Mantova* (Biblioteca Comunale, Mantua, *Manoscritti*, 1022 I.I.5), an unpublished 15th century source: "In the above-mentioned year [1455], on 20 December at the fifth hour of the night, there was a great earthquake at Mantua".

Nel sopradetto millesimo a di 20 dicembre a hore 5 di notte fu a Mantova un gran terremoto.

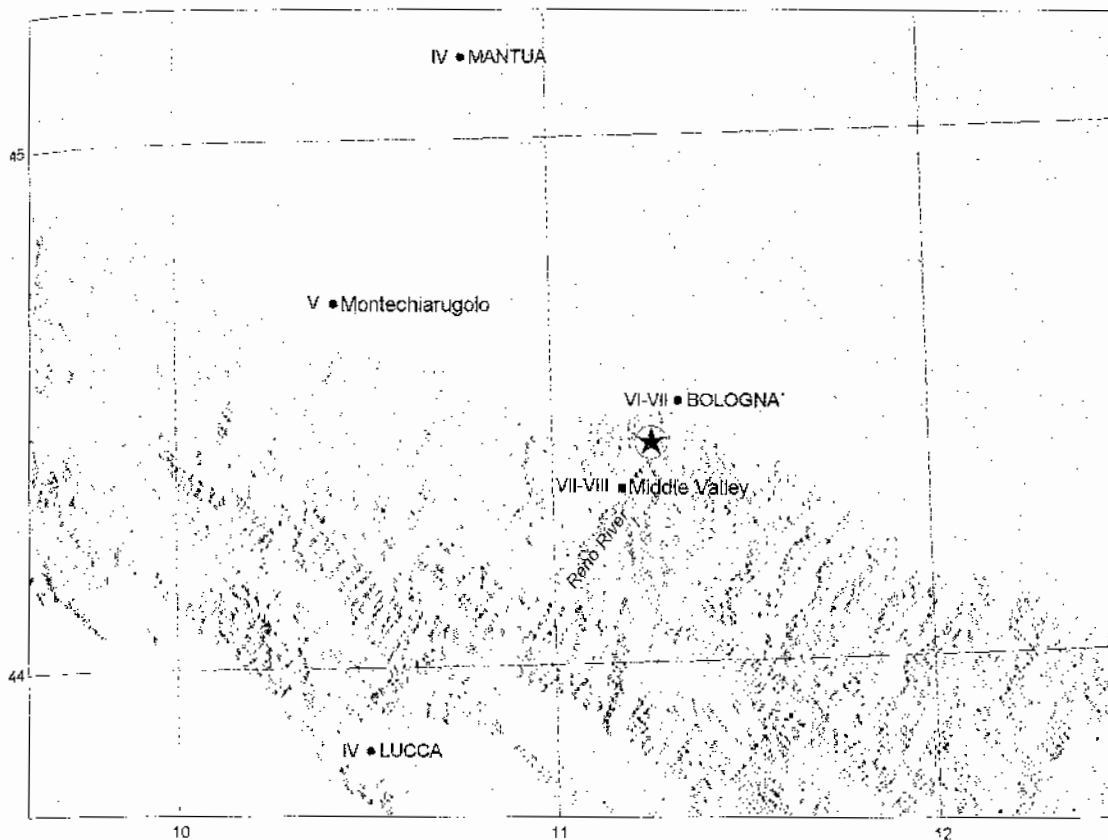
A mention of this earthquake in the diary of Ruberto dal Portico, a nobleman from Lucca, is quoted by Guidi (1915, p.24):

"1455. On 20 [December] at a quarter past the fourth hour, there was a great earthquake [at Lucca] which did not last very long".

"1455. A di 20 [dicembre] a hore 4 1/4 fue un gran tremuoto [a Lucca] et non durò troppo".



fig. 116 Bologna: the church of the Madonna del Monte (detail from an early 17th century map, now in the Archivio dell'Opera Pia dei Poveri Vergognosi). The church and its bell-tower were badly damaged in the earthquake of 20 December 1455. They stood on top of the nearest low hill to the plain in which Bologna is situated. The church was visited by pilgrims for many centuries. Its remains were enclosed within Villa Aldini at the beginning of the 19th century.



1455
December 20

0 30 km

fig. 117

▲ 1455 12 20 20:45 UT ★ = 44 25 11 16 I₀ = VI-VII Me = 5.3 Sites: 5

localities	lat.	long.	I	localities	lat.	long.	I
■ Middle Reno valley	44 20	11 11	VII-VIII	Lucca	43 51	10 30	IV
Bologna	44 30	11 20	VI-VII	Mantua	45 09	10 47	IV
Montechiarugolo	44 42	10 25	V				

(309) 1456? May 13 – August 31 Mount Athos [Greece]

sources *Notula* in Eustratiadis and Arkadios (1924, p.205)
catalogues d. Evangelatou-Notara (1993); *Papazachos and Papazachou (1997)
catalogues p. Shebalin *et al.* (1974)

At some unspecified time, perhaps between 13 May and 31 August 1456 (but there are still unresolved chronological problems), an earthquake was felt at the Vatopedi monastery (on Mount Athos, in the Chalcidice peninsula), one particularly violent shock being described as a “tremendous” shaking. But no specific effects are recorded. There is information about this earthquake in a *Notula* in manuscript Athos. Vatopedi 1223, fol.307v. (published in Eustratiadis and Arkadios 1924, p.205):

“In the year 6964, in the fourth indiction, on 12 May, the very holy former patriarch lord Gennadius came to our holy Vatopedi monastery, on Saturday, the evening of the feast of Holy Pentecost. In the same year, on 19 there was an earthquake and a tremendous shaking of the earth, during the fourteenth hour of the day, a Friday”.

Ἐν τῷ ς' λξδ' ἰνδ. δ' μηνὶ μαίῳ β' ἦλθεν ὁ παναγιώτατος πρῶν πατριάρχης κύριος Γεννάδιος ἐν τῇ καθ' ἡμᾶς ἱερᾷ μονῇ τοῦ Βατοπεδίου ἡμέρᾳ σαββάτῳ ἐν ἑσπέρᾳ τῆς

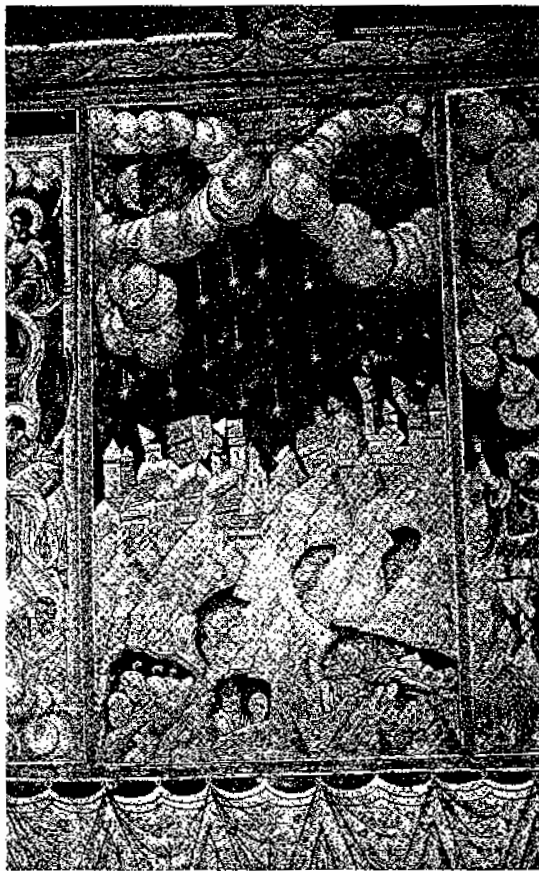


fig. 118 Mount Athos (Greece): wall-painting in the *katholikon* of the Dionysiou Monastery. It is likely that an immediate source of inspiration for this image of the *Apocalypse* was the local earthquake of 1455/1456.

ἀγίας Πεντεκοστής τῷ αὐτῷ ἔτει 19 ἐγένετο σεισμός καὶ κλόνος γῆς φρικωδέστατος ὥρα τῆς ἡμέρας 18 ἡμέρα παρασκευῆ.

The chronology of the earthquake is particularly problematical because the *Notula* makes no mention of the month concerned. And there is also a contradiction, in that 12 May 1456 was a Wednesday, not a Saturday.

Since the items of information seem to be in chronological sequence, the earthquake must have occurred on a Wednesday 19 between 13 May and 31 August 1456, it being specified in the *Notula* that the earthquake occurred in the year 6964 (which covers the period from 1 September 1455 to 31 August 1456). But there was no Wednesday 19 between May and August 1456. If the earthquake occurred during that period, then there is a mistake either in the day of the week (Friday) or in the date of the month (19), in which case it is impossible to pin down the date exactly. In the year 6964 there were only two Fridays which fell on 19 of the month, namely 19 September 1455 and 19 December 1455, but both are earlier than the day when Gennadius Scholarius visited Vatopedi. 19 November 1456 (the date suggested by Evangelatou-Notara) was also a Friday, but it falls within the year of the world 6965. Shebalin *et al.* (1974, sheet 11) date the earthquake to 19 May 1456.

Papazachos and Papazachou (1997, p.196) are mistaken in giving the date as 12 May 1456, for that was the day when Gennadius arrived at Mount Athos, not the day of the earthquake.

▲ 1456? 05 13 -- 08 31

Location	lat.	long.	I
Mount Athos	40 10	24 19	VII-VIII?

- <310> 1456 December 5 Upper valley of Pescara river Central and southern Italy
- <311> 1456 December 5 Bojano and Isernia area
> landslides, fissures, clouding of springs <
- <312> 1456 December 5 Samnium and Irpinia
> tsunami, escape of gas, changes in the water level in wells <
- <313> 1456 December 5 central Apulia region
- <314> 1456 December 7 Naples
- <315> 1456 December 21-22 Naples
- <316> 1456 December 30 Naples > clouding of springs <
- <317> 1457 January 8-9 Naples
- <318> 1457 February 10-11 Capua

sources I Documents

[manuscripts] ACAR, Barcelona, *Cancellaria*, Privileg. Neap., 2916, Alfonso of Aragon, Privilege, 9 June 1457; 2917, Alfonso of Aragon, Privilege, 29 July 1457; ASVat., *Reg. Vat.*, vol.450, fol.272, Calixtus III, Privilege, February 1457; vol.447, Calixtus III, two Privileges, fol.123v, 23 April; fol.255v-256r., May 1457; vol.463, fol.44r., Calixtus III, Privilege, 24 May 1457; ASNa, *Regia Cam. Somm.*, Petiz. e signific., vol.1, fol.38, *Relevio*, 14 February 1457; fol.47, *Relevio*, 9 March 1457; *Monast. soppr.*, vol.435, fol.1r., Account, 15th cent.; *Pergamene Soc. St. Pat.*, 10.CC.III, no.14, Renunciation, 15 March 1478; ACattCampob., *Regesti Gallucci*, 18, no.57, Deed, April 1458; Marquis of Pescara, Privilege, 30 March 1457, in Balzano (1915, p.12, no.7); Petition to king Alfonso of Aragon, 28 January 1458, in Gentile (1910, pp.668-9); Notarial deed, 11 April 1458, in Idra and Speranza (1991, no.52, pp.182-6); Pius II, Brief, 3 September 1459, in De Nicastro (1976, pp.121-2); Pius II, Bull, 5 September 1459, in Borgia (1763-69, III, p.394); Giacomo della Ratta, Bull, 7 October 1460, in De Nicastro (1976, pp.122-5); Account, in Viti (1972, doc.XVIII, app.I, p.385)

Letters

Antonio da Trezzo to F.Sforza, 6, 22 and 28 December 1456, 10 January 1457 (ed. Senatore 1997, no.177, pp.464-5, no.178, pp.466-7, no.181, pp.470-2, no.183, pp.473-7); Ercole d'Este to Borso d'Este, 7 December 1456 (ed. Senatore 1997, no.174, pp.461-2); Bindì to the authorities of the Sienese Republic, 7 December 1456 (ed. Senatore 1997, no.173, pp.458-61); Manetti G. to Vesp. da Bisticci, 8 December 1456 (ed. Cagni 1969, no.13, pp.135-6), to the Florentine *Signoria* and to F. Manetti, 8 December 1456, in Figliuolo (1989, II, doc.IV, pp.17-9, doc.V, pp.20-2); Rucellai P. to G.Rucellai, 8 and 14 December 1456, in Rucellai P. (ed. Perosa 1960, pp.57-9, 58-60); Strozzi F. to A.Macinghi, 8 December 1456, in Macinghi (ed. Guasti 1877, pp.138-40); Boquet P. to the councillors of the city of Barcelona, 8-9 December 1456 and 31 March 1457 (ed. Madurell Marimón 1963, no.490, pp.544-5, no.506, pp.573-5); Dusany to the Catalan deputies, 9 December 1456 (ed. Duran and Sanabre 1930, I, no.76, p.228); Contarini to doge F.Foscari, 11 and 15 December 1456 (ed. Senatore 1997, no.175, pp.462-3, no.176, pp.463-4); Letter of the Mantuan ambassador to Luigi III Gonzaga, 12 December 1456, in Figliuolo (1989, II, doc.VII, pp.25-7); Letter of unknown authorship, 18 December 1456, in Figliuolo (1989, II, doc.VIII, p.28); Piccolomini to Frederick III, 28 December 1456, in *Epist.* (ed. 1518); Amadei to the authorities of the Sienese Republic, 9

January 1457, in Figliuolo (1989, I, p.37); Talamanca G. to F.Sforza, 13 January 1457, in Romano (1888, pp.783-4); Decembrio to C.Simonetta, 14 January 1457 (ed. Senatore 1997, no.184, pp.477-9); Del Carretto to F.Sforza, 31 January 1457, in Figliuolo (1988, I, p.173); Letter of unknown authorship, [January 1457?], in De Blasiis (1885, pp.358-9); Cusani to F.Sforza, 11 February 1457 (ed. Senatore 1997, no.189, pp.490-2); Ammannati Piccolomini, Account, in *Epist.* (ed. 1506), p.206r.-v.

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Report attached to letter to F.Sforza, [22 December 1456] (ed. Senatore 1997, no.179, pp.467-9); Report of unknown authorship to P.Colonna, [January 1457], in Figliuolo (1989, II, doc.X, pp.31-3); Goro di Giovanni, Report, [February 1457], in Figliuolo (1989, II, doc.III, pp.15-6)

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BAVat, *Pal. Lat.*, 1077, Manetti, *De terraemotu*, 1457; Dell'Aquila Matteo, *Tractatus*, (ed. Figliuolo 1990), pp.38-70

Annals, Chronicles, Notulae

[manuscripts] JNULJerusalem, *Heb. Ms.*, 38^a, 4281, *Notula*; BAVat, *Vat. Lat.*, 5949, fol.247r, *Notula*; BNNaples, *Mss.*, V.H.135, *Notulae*; AAbMontecassino, cod. 47, fol.20, *Notula*; [edited] Paoli, *Notula*, in Perrone Capano Compagna (1983, p.38, no.7); Bonincontri, *Chron.*, col.159; De Ritiis, *Chron.*, pp.203-4; D'Angeluccio, *Cron.*, col.894; Della Morte, *Cron.*, p.97; Giovanni di m. Pedrino, *Cron.*, p.113; Infessura, *Diario*, p.61; Nicola della Tuccia, *Cron.*, p.34; Palmieri Matteo, *Ann.*, p.177; Dello Mastro, *Diario*, p.114; Pierozzi, *Chron.*, pp.92-6; Tummoillo, *Not.*, pp.69-70; Piccolomini, *Comm.* (I, p.190); *Asiae* (ed. 1531, p.498)

Population source

Lib. focorum, ed. Cozzetto (1986, pp.55-172); *Rationes decimarum Italiae* (Maps)

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|----------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| inscriptions | 1. cathedral of Ariano, in <i>Italia Sacra</i> , vol.8 (1721, col.217); 2. a house at Orsara di Puglia, in Rosso (1907, p.195); 3. courtyard of the <i>palazzo ducale</i> at Tocco da Casauria, in Magri and Molin (1984, fig.3, and p.158); 4. church of Ripalimosano, in Magri and Molin (1984, p.138); 5. church of S.Maria del Colle at Pescocostanzo, in Sabatini (1960, p.111); 6. church of San Pietro Avellana, in Figliuolo (1989, II, p.172); 7. cathedral of Ariano, in Pantosti and Valensise (1989, p.547) |
| sources 2 | <i>Gesta arch. Magdeb.</i> , pp.471-2; <i>Ann. Foroliv.</i> , p.97; <i>Diurnali</i> , pp.202-3; Chartier, <i>Chron.</i> , pp.70-2; D'Eschouchy, <i>Cron.</i> , pp.344-50; De Ripalta, <i>Ann.</i> , col.905; Di Palazzo, <i>Cron.</i> , I, p.217; Fecini, <i>Cron.</i> , p.867; Guerr. Gubbio, <i>Cron.</i> , p.66; Miralles, <i>Dietari</i> , p.196; <i>Ann. de Raimo</i> , col.232; [Platina], <i>Liber</i> , p.343; Rinuccini, <i>Ricordi</i> , p.LXXXVI; Albertucci de' Bors., <i>Cron.</i> , p.93; Buoninsegni, <i>Storie</i> , p.118; <i>Cron. Var.</i> , IV, pp.246-50; Pietro Angelo di G., <i>Cron.</i> , 4, pp.320-3; Ghirard., <i>Della hist.</i> , pp.163-4; Nadi, <i>Diario</i> , p.40; Astesano, <i>De adm.</i> , pp.205-17 |
| historiography | De Blasiis (1885); Motta (1887); Romano (1888); Gentile (1910); Tallone (1913); De Nicastro (ed. 1976); Figliuolo (1985); Cozzetto (1986); Busi (1995); Senatore (1997); Figliuolo (2002) |
| literature | Magri and Molin (1984, 1985); SGA, Report [1985]; Guidoboni (1985); Figliuolo (1988-89); Meletti <i>et al.</i> (1988-89); Guidoboni and Ferrari [2004]; Fracassi and Valensise (2004); DISS 3.0 Working Group (2005) |
| catalogues d. | Filippo da Secinara (1652); Magnati (1688); Bonito (1691); Mongitore (1743); von Hoff (1840); Perrey (1848); Mallet (1853); Capocci (1861-63); Mercalli (1883); Baratta (1901); Milne (1911); *Boschi <i>et al.</i> (1995, 1997, 2000) |
| catalogues p. | Giorgetti and Iaccarino (1971); Carrozzo <i>et al.</i> (1973); Postpischl (1995); CPTI (1999) |
| catalogues Ts | Caputo and Paita (1984); Tinti and Maramai (1996-97); Soloviev <i>et al.</i> (2000) |

History of the earthquake's interpretation

This is one of the most important and best documented earthquakes in the whole of Italian seismic history. Its highly destructive effects (intensity greater than or equal to grade IX on the MCS scale) at about a hundred locations across a huge area of central and southern Italy are quite exceptional when compared to other known earthquakes in the central and southern Apennines. The study of this earthquake has had its own long and original tradition, and the considerable problems involved go back to

its beginnings, at the time of the earthquake itself. For contemporary scholars immediately arranged for long reports to be drawn up describing the overall picture of effects, based on reports reaching the court at Naples from outlying areas. Even before Bonito (1691) and Baratta (1901), therefore, there already existed a complex corpus of information based on authoritative contemporary sources, as well as local historiography, which sometimes unjustifiably enlarged the damage zone.

In an effort to improve our understanding of the earthquake, fresh studies were undertaken in the 1980s. The first to suggest that the macroseismic picture of the earthquake should be interpreted as indicative of several superimposed shocks were Magri and Molin (1984, 1985), on the basis of new sources and freshly discovered documents, including the famous treatise by Giannozzo Manetti, *De terraemotu*. This treatise survives in seven codices, four of which are in the Biblioteca Apostolica Vaticana; it is one of the most important and reliable sources previously unknown to the seismological tradition. At the time when these studies were being carried out, a substantial piece of critical research into documentation was begun within the ambit of studies set in motion by ENEL (for the identification of possible nuclear power station sites). The investigations carried out in this context were very detailed, partly in an effort to establish confirmation of the sequence of shocks and their exact location (SGA, Report 1985). It was in this context that thorough historical studies were begun by Figliuolo (1988-89), who has made a valuable contribution to knowledge of the sources for this earthquake. Magri and Molin (1984, 1985) and Meletti *et al.* (1988-89) suggested that three different faults were activated more or less simultaneously. They make a macroseismic area comparison between the known destructive earthquakes in the central and southern Apennines and that for the 1456 earthquake, in an attempt to identify significant areas of correspondence. In its three editions (Boschi *et al.* 1995, 1997, 2000), the CFTI catalogue has successively considered and developed the study by Meletti *et al.* (1988-89), accepting their suggestion that different source areas were activated, but not splitting the overall picture of effects into territorial subdivisions. Research into this complex seismic sequence was resumed in 2003 within the ambit of INGV investigations into active faults in the central and southern Apennines. The results were drawn up in a Technical Report (Guidoboni and Ferrari 2004) which added to previous knowledge by including data on the population of the kingdom of Naples obtained from a census carried out a few years before the earthquake (*Liber focorum*, in Cozzetto 1986, pp.55-172). In this way, it was possible to put together a fairly complete picture of the settlement network and demography of the area affected by this major event, including localities for which the sources do not record earthquake effects (also taken from the maps of the *Rationes decimarum*).

The new features in this picture are indicative of a much more complex situation than was previously thought; and indeed it provides some elements in support of the hypothesis of the activation of four different source areas. Furthermore, a more careful analysis of the sources has brought to light some rare and previously neglected data on the chronology of the whole seismic sequence. This also seems to offer fairly clear support for the hypothesis of a rapid sequence of four earthquakes — perhaps only a few seconds apart. And in addition, a quantitative analysis of the reported number of victims in relation to the terminology used in the principal sources to describe the level of effects at the various locations has brought to light some inaccuracies in previous estimates. The conclusions reached necessitated some modifications to previous intensity estimates in a number of cases. Set out below is this most recent level of analysis, which brings up to date all research data on the event in question.

A hypothesis of four earthquakes on 5 December and the sequence of shocks

The complexity of this seismic sequence can immediately be seen by reference to its chronology and the way it is referred to in contemporary sources.

Contemporary sources are aware of two distinct "peaks" of activity, during the night of 4-5 December and 30 December 1456 respectively. For the first peak, there are two reports which help us to understand some aspects of the physics of the phenomenon and help explain the complexity of this first event.

The earthquake of 5 December occurred at about 3:00 UT (the 11th hour, "Italian time"), and is recorded as having been prolonged. It is interesting to note that most witnesses agree that it lasted more than 120 seconds. The duration is naturally indicated in qualitatively different ways on the basis of the length of prayers (common practice in those days): the time needed to say a *miserere* twice (*due miserere da frati; doe fiare miserere mei Deus*); one and a half times the time required to recite the *In principio erat verbum* (*una volta et meza lo In principio erat verbu*); or the time needed to say the Lord's Prayer 10 times (*spatium temporis dicendi decies patrenostri*).

Giannozzo Manetti, one of the most reliable witnesses, records that, in Naples, there was a single violent, continuous and uniform shock: "at the beginning, the shaking was great and powerful, with walls and beams moving so violently that you would scarcely have believed it if you had not seen or heard it, and it continued like that uninterruptedly until it ceased" (*l'empito nel principio fu grande e forte, colla commozione delle mura e delle travi, tale e tante, che per affermarlo non pare credibile se nonne a cchi l'avesse veduto o udito; et mantenesi a quel modo senza intermissione continuo insine al suo fine*). This perception of the earthquake is obviously quite subjective, but it provides reliable confirmation of its long duration, as perceived by other witnesses and stated in the sources.

Other details are provided by a witness who lived at San Germano (present-day Cassino), an area outside that of the worst effects. A detail provided by his text is that the earthquake was clearly perceived as involving three shocks. The witness in question was Angelo Tummolillo, a notary, who recorded his impressions as follows: "when the earthquake began, the earth shook uninterruptedly and rose up with all the buildings, sometimes briefly and sometimes for longer periods and repeatedly [...] during which time the earth moved and shook three times with great tremors" (*qui terremoto quando cepit tremere sine intermissione terra tremebat et sese sublevabat cum omnibus hedificiis, quando paulisper et quando plus et plurimum sublevando [...] inter quod spatium tribus vicibus et insultibus mangnis terra se submovit et insultavit*).

These remarks seem to us to support the hypothesis that there were three earthquakes in very close succession — perhaps separated by no more than a few seconds.

The earthquakes of 5 December were followed by another strong earthquake on 30 December. Contemporary reports do not differentiate between the effects caused by each of these two "peaks", but an analysis of the sources suggests that they both struck the same localities, though much less violently on the second occasion. The shocks which occurred at about 3:00 UT on 5 December were followed by weak aftershocks. Witnesses at Naples record two weak shocks, or more generically "some" shocks, which were felt only by some inhabitants. At San Germano (Cassino), however, the above-mentioned Angelo Tummolillo records 9 shocks, but without indicating their effects.

For about a week afterwards, from 2 to 4 shocks a day were felt at Naples. In the case of only one of these is the exact time given: it occurred at about 21:00 UT (the 5th hour, "Italian time") on 7 December and was felt slightly. Other weaker shocks followed at greater intervals. The only one of these to be recorded specifically was felt on the night of 21-22 December and did not cause any damage.

The 30 December earthquake occurred at about 8:20 UT (the 16th hour, "Italian time"). It was felt strongly at San Germano (Cassino) and Naples but, as pointed out above, was less violent than the event on 5 December. The shocks continued fairly frequently throughout January 1457. The only earthquake to be recorded with some precision occurred on the night of 8-9 January and caused more damage at Naples. Frequent but very weak shocks are recorded as still occurring in early February 1457: one of these occurred during the night of 10-11 February and caused the collapse of three

great was their fear. Furthermore, six parts of the town in which houses had been destroyed caught fire, and many dead bodies were burned and reduced to ashes. Then people who lived outside the town or in the castles of the surrounding area came and took away all our belongings, our money, gold and silver and all our surviving possessions. This was during the reign of king Alfonso of Aragon and Sicily”.

Et Civitas nostra Aeserniae totaliter fuit ruinata, et conquassata, et omnia aedificia à majore usque ad minus projecta in terram, Templum divini cultus totaliter fuit ruinatum et conquassatum, et aliarum Ecclesiarum praefatae civitati nulla remansit incolumis. Nec non in dicta Civitate mortui prae magno terraemotu in illa nocte circa octingenti homines. Illi autem qui remanserunt, erant pleni cicatricibus, vulnerati etiam pro majori parte reclusi sub lapidibus pro magna ruina terremotus. Mane autem facto, omnes illi qui vivebant, exierunt de civitate, eo quod timebant, ne suffunderetur propter continuationem terraemotuum, postmodum quod terra erat ita desolata, et devastata, nullus audebat stare, vel morari in ea prae timore magno. Praeterea praefata civitas succensa fuit in ruinatione domorum in sex partes et combusta, seu cremata fuerunt multa corpora mortuorum. Imposterum venerunt forenses, et castrenses, qui erant in circuito nostro, et abstulerunt omnia suppellectilia, nostram pecuniam, aurum et argentum, et caetera cuncta bona restantia. Regnabat tunc in diebus illis Rex Alphonsus de Aragona Sicilie citra et ultra.

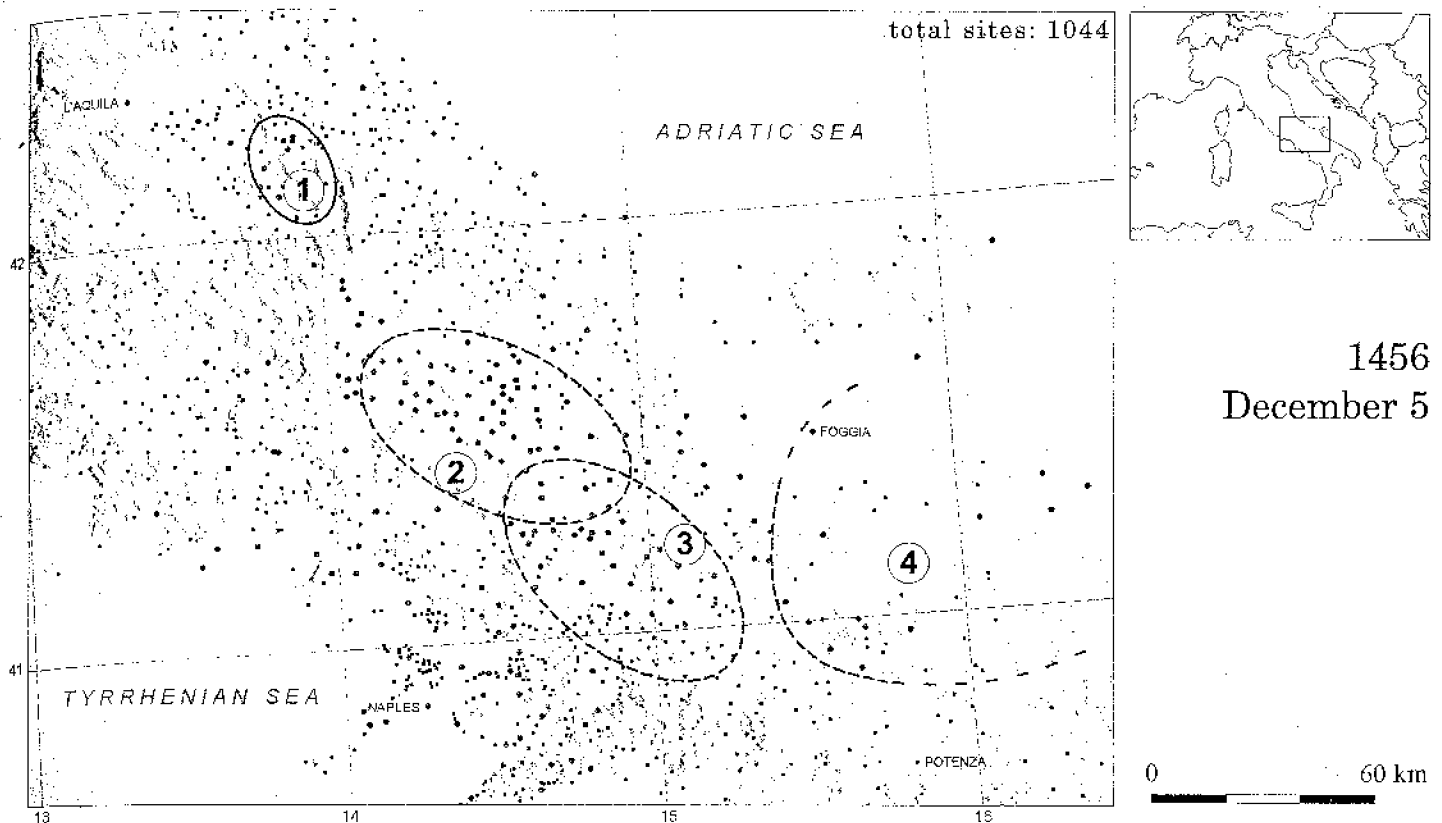
Since the city had suffered serious damage, king Alfonso of Aragon confirmed its privileges in a document dated 29 July 1457, which includes the following statement: “we have been humbly petitioned by the community [...] of Isernia [...], that, in our kindness, we should deign to allow the continuance of that third part of the above-mentioned permission granted to the said community, so that the town walls may be rebuilt, for they were struck by the great earthquake and lie in almost total destruction. [...] Given in Castelnuovo in our city of Naples on 29 July in the fifth indiction in the year 1457 since the birth of Our Lord”.

supplicatum est nobis humiliter pro parte universitatis [...] Ysernie [...] ut ex nostra benignitate eam ipsam tertiam partem provisionis memorate eidem universitati, gratia quidem muros eius civitatis reformandi, cum, iam pridem ingenti terremotu percussi, ad terram pene undique iacerent labefacti concedere dignaremur [...]. Datas in Castellonovo civitatis nostre Neapolis die vicesimo nono mensis Julij quinte indictionis anno a nativitate domini Millesimo CCCCLVIJ^o.

There is another parchment, dated 15 March 1478 and written at Isernia (Archivio di Stato, Naples, *Pergamene della Società di Storia Patria*, 10.CC.III, no.14), which certifies that Lembo de Chyobilita renounces the lease on a house in Isernia owned by the local Church, because it has been reduced to ruins in the earthquake. Earthquake effects at Isernia are also recorded in the following chronicles: the L'Aquila chronicles of Francesco D'Angeluccio and Alessandro de Ritiis, the *Notabilia temporum* of Angelo Tummolillo, the *Cronaca di Viterbo* of Nicola della Tuccia, and the Brescian chronicle of Corradino di Palazzo.

Paduli (province of Benevento)

Almost all its buildings collapsed, including the fortress. Paduli was a town of 275 hearths (estimated population: 1,375), and there were 1,300 victims (94.5%). The sources are 11 letters written between 6 December 1456 and 14 January 1457, three reports of unknown authorship, Manetti's treatise, and two contemporary chronicles. The first letter was written to duke Francesco Sforza by the Milanese ambassador, Antonio da Trezzo, and was sent from Naples on 6 December 1456: “Messer Jacomo Carbone, who possessed a castle called Paduli not far from Benevento, has had that castle reduced to ruins, and three of his children are amongst the victims”.



1456

December 5

fig. 119 The map shows our overall interpretation for the 5 December 1456 earthquake. The extent of the damage area and the spatial and chronological complexity of the seismic sources make 1456 one of the largest earthquake sequence to have occurred in Italy in second millennium. Based on recent historical and linguistic revision of this event [Guidoboni and Ferrari, Report 2004] and recent tectonic analyses completed by INGV scientists (Fracassi and Valensise, 2004; DISS 3.0 Working Group, 2005) the global intensity pattern is interpreted as due to the activation of at least 4 major earthquake sources, resulting in 4 distinct areas of damage concentration (see pp.721-723 for the assessment of the effects). Red dots (no.206) indicate towns, villages and castles for which there exists an intensity assignment; black dots (no.838) indicate towns, villages and castles that certainly existed at the time of the earthquake, but for which no account of damage is given by contemporary sources. Although the density of population has significantly increased, the density of the settlements resulting from a census completed in 1453 (ed. Cozzetto 1985) is very similar to the present one.

houses in Capua (which had probably been damaged earlier); it was probably felt also in Naples.

Increasingly infrequent shocks were felt in the succeeding months up to May 1457.

To sum up: the new research by Guidoboni and Ferrari [Report, 2004] and the tectonic inferences by Fracassi and Valensise (2004; summarised also in DISS 3.0 Working Group, 2005) has made it possible to identify four damage zones, possibly corresponding to four epicentral areas, and hence to four independent seismogenic sources. From north to south, they are:

1. the upper valley of the river Pescara, in the Tocco da Casauria, Torre de' Passeri and Popoli area;
2. the northern flank of the Matese mountains, in the Bojano and Isernia area;
3. the area of Samnium and Irpinia, which includes the villages of Paduli, Apice and Ariano Irpino;

(central Apulia region) and also perhaps Salentine peninsula. Epicentral area 4 includes the anomalously high intensity of Canosa di Puglia (IX), close to sites that experienced negligible intensity (V) such as Andria, Barletta and Trani. These latter localities reflect the overall low damage described in the account by Giannozzo Manetti (1457) the only one describing far-field effects in Apulia. The high intensity at Canosa di Puglia, therefore, is what constrains the SW-NE orientation obtained for the macroseismic source of this subevent. The borders of these last three areas are naturally imprecise, and not clearly distinguishable on the basis of effects alone (see parameters below). However, this subdivision may contribute to an improvement in the seismotectonic interpretation of the area. For details of effects at individual localities, see below.

Scenario of overall effects and deaths

The earthquakes of December 1456 affected a huge area of the kingdom of Naples, corresponding to four of the regions of present-day Italy: Campania, Basilicata, southern Abruzzo and Molise. More than a hundred localities suffered serious damage, ranging from large cities like Naples and Benevento, to heavily populated villages in the Campanian plain around Benevento, and fortified settlements in Abruzzo. The social and economic fabric of the kingdom of Naples was very varied: unenclosed villages in the plain relied mostly on agricultural activities; localities in the Abruzzo and Molise Apennines (except for fortified settlements with a military function) had a characteristically pastoral economy, relying on transhumance from Apulian pastures. The settlement system consisted mainly of small villages with a small number of hearths (these were a family-based fiscal unit). From 15th century fiscal rolls it appears that 80% of the population lived in villages of less than 200 hearths.

It is not possible to establish an exact number of dead from contemporary sources. From the earliest days after the earthquake, we find a series of different figures. In ambassadors' letters written between 6 and 12 December, the number of dead is not given overall but by locality: for Naples it varies between 100 and 150, and in the same letters deaths at Ariano Arpino vary between 2,000 and 8,000. In slightly later writings, some authors attempted to calculate the overall number of dead, but this also produced enormous disparities: in a letter dated 18 December (in Figliuolo 1988-89), the figure quoted is 70,000 dead; Iacopo Ammannati Piccolomini (ed. 1506) gives 60,000, whereas a report from ambassador Antonio da Trezzo gives 30,000. Similar variations appear in contemporary chronicles. Ambassador Contarini gives the much lower figure of 12,000 deaths, Matteo dell'Aquila (ed. Figliuolo 1990) tells of about 7,000 dead, whereas Giannozzo Manetti's treatise tells of about 27,000. On the basis of these figures, Figliuolo (1988-89) compared the reported number of dead with the approximate estimated population of the affected localities (290,000), thus arriving at a death rate of about 9.5%.

Apice, Ariano Irpino, Bojano, Isernia and Paduli were particularly badly hit, losing more than 50% of their inhabitants. But the earthquake did not interrupt the upward demographic trend experienced in the kingdom of Naples at that period. Indeed, recent historiographical analysis tends to downgrade the effects of the earthquake on demographic and territorial aspects of the affected areas, especially as regards Abruzzo, where local history had reported a process of reduction in the number of castles, involving the abandonment of fortified sites in the uplands and the concentration of the population in larger centres in the plain. It has to be pointed out, however, that while it is certainly the case that some villages down in the valleys experienced a substantial increase in population between the mid-15th and early 16th century, there is not always evidence to suggest a connection between the earthquake and this process of population redistribution, which also affected areas not struck by the earthquake.

On the other hand, the earthquake had important economic consequences for the

wealth of the Church State, particularly in medium-sized and large towns like Benevento, Bojano, and Sulmona: many churches were obliged to dispose of some of their own properties in order to pay for reconstruction work.

King Alfonso of Aragon did not make any special provisions for reconstruction; indeed, he was at Foggia when he heard about the earthquake, and did not even think it necessary to return to Naples, staying in the region of Foggia until early February. Nor did the king accept the petitions for tax exemption presented by the communities affected, for he replied that the survivors were in a position to pay, since they had inherited the goods of the victims. When the 1457 taxes were imposed, they even included an increase of one ducat per hearth, as decided the previous year.

Environmental effects: overview

Information about environmental effects is sparse and fragmentary. The most substantial effects were at Bojano, which was completely flooded, probably as a result of the blocking of the river Biferno by a landslide, and at Castel di Sangro, which was struck by a landslide from the mountain which overlooks the village. At Castellammare di Stabia there were exhalations of hydrogen sulphide; at Fornelli there were fissures and cracks in the earth; and at San Germano (present-day Cassino) springs became cloudy for three or four days. In Naples, water overflowed from springs and cisterns. There are also reports of tsunami effects in the port of Naples: the sea became extremely rough and all the boats at anchor collided dangerously with one another. One, in fact, completely broke up. For a detailed discussion, see pp.718-21.

Reconstruction work

There are numerous scattered references to reconstruction work in the period following the earthquake, but this is something which has attracted little attention in the historiography of central and southern Italy. In spite of king Alfonso's studied indifference, which the chronicles record in critical terms, the damaged buildings in Naples itself were shored up and subsequently repaired by 1464, as we are told by Enea Silvio Piccolomini (ed. 1531). There is also evidence of restoration work at the following ecclesiastical buildings: the church of S.Domenico in Naples; the church of S.Bartolomeo Apostolo in Benevento; the cathedral at Ariano; the church at Calvi; the monastery of S.Maria di Realvalle; the church and monastery of S.Maria at Venticano; the church of S.Maria del Colle at Pescocostanzo. At the abbey of Montecassino, repairs were carried out to the dormitory and cloister, but we do not know for certain whether these repairs were indeed related to earthquake damage (for the sources and the references see later in the individual sites). But some papal privileges to which local Apulian historiography has drawn attention cannot be related to damage caused by this earthquake. They may refer rather to destruction caused during the war of succession in Terra d'Otranto. By making an exhaustive examination of the sources it has been possible to put together a detailed picture of the effect of the earthquake on contemporary society, and to identify the various descriptions of effects passed down by the various authors, not to mention the mistaken interpretations which led, until recently, to the acceptance of an unjustified extension of the damage zone as far as Apulia. To complete our critical analysis, we examined later historiography, from the 16th to the 20th century, as well as naturalistic treatises in which the earthquake is mentioned.

Historical sources: an overall view

The historical data underlying parameters for this earthquake are themselves the result of critical research which has taken advantage of the historical research of Figliuolo (1988-89). Figliuolo subsequently published Matteo dell'Aquila's treatise (1990) and in a study published in 2002 he cited two new sources: a document and a letter (pp.887, 889).

LETTERS, REPORTS AND TREATISES

The first important group of primary sources consists of the numerous letters and reports sent by ambassadors at the Neapolitan court, which was at Foggia at the time of the earthquake. With the exception of a letter of 31 March 1457, almost all these sources were written within a few days or weeks of the earthquake, between 6 December 1456 and 14 January 1457. Most of them are to be found in the Archivio di Stato in Milan, Venice and Siena, the Bibliothèque Nationale de France, and the Österreichisches Nationalbibliothek in Vienna. Some of these letters were published by De Blasiis (1885), Motta (1887) and Romano (1888). Others have been published by Figliuolo (1989, II, docs.I-X) and Senatore (1997). We know of letters and reports from the Milanese ambassador, Antonio da Trezzo, who wrote as many as four letters (6, 22 and 28 December 1456 and 10 January 1457), the Siense ambassador Bindo Bindi (7 December), the two Catalan ambassadors from Barcelona, Pere Boquet (8-9 December 1456 and 31 March 1457) and Pere Dusany (9 December 1456), the Venetian ambassador Bertuccio Contarini (11 and 15 December 1456), the Mantuan ambassador (identity unknown, 12 December 1456). There are also brief items of information about the aftershocks which followed 5 December 1456 in letters from the Siense ambassador Luca Amadei (9 January 1457), from the royal Aragonese secretary Gaspare Talamanca (13 January 1457), from the Milanese ambassador Ottone del Carretto (31 January 1457), and from the Milanese envoy Francesco Cusani (11 February 1457).

There are also some quite numerous letters from members of the clergy and private citizens which record particular aspects of the earthquake's effects at Naples and other places in the Kingdom. The letters concerned were written by Ercole d'Este (7 December 1456), the famous humanist Giannozzo Manetti (three letters, 8 December 1456), the Florentine merchant Paolo Rucellai (8 and 14 December 1456), the banker Filippo Strozzi (8 December 1456), the cardinal Enea Silvio Piccolomini, the future pope Pius II (28 December 1456), the humanist Pier Candido Decembrio (14 January 1457), the Florentine citizen Goro di Giovanni (probably on February 1457) and four unidentified writers (two letters and two reports 18 and 22 December 1456 and probably on January 1457).

The information provided by these letters is considerable; it is sufficient, in fact, to make up for the lack of sources from local authorities subject to the Neapolitan court, whose documentation had been destroyed. In spite of checks carried out at local level, only a modest quantity of public documents has been found.

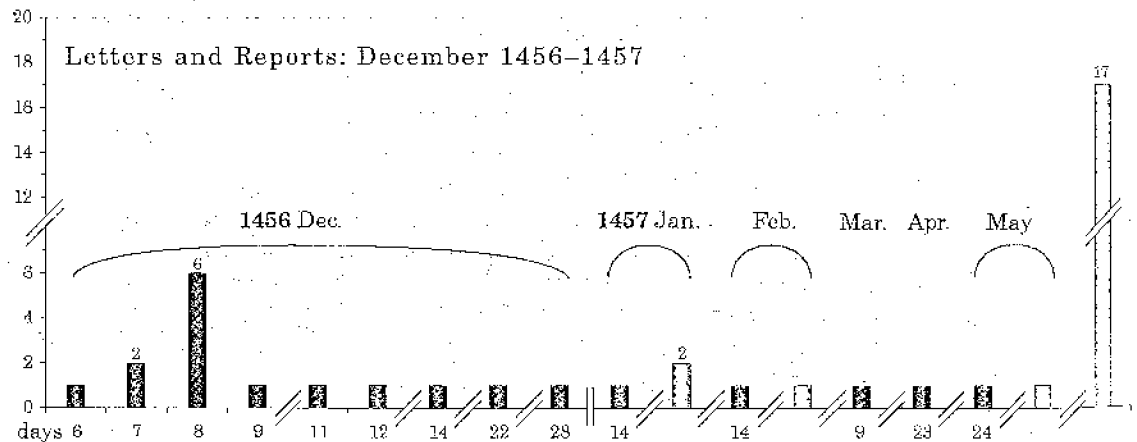


fig. 120 The number and dates of the letters and reports written between 6 December 1456 and May 1457, used here. Altogether there are 41 sources, of which 15 written in December and 26 in the remaining period. Other archival and memorialist sources are not counted. The light columns represent the sources whose dating is incomplete.

Two reports which have proved of great importance are contained in i) the chronicle of Antonino Pierozzi, bishop of Florence (he subsequently became a saint of the Roman Church), and ii) the *Trattato de terraemotu libri tres*, by Giannozzo Manetti, famous Florentine humanist (Baldassarri 2003). The first of these texts contains a lengthy account, perhaps of an official kind, which probably reached Florence in January 1457. The second contains the most detailed and comprehensive report known to date about this earthquake. The account is in the third book of the treatise, and was probably based on the official governors' reports sent to Naples straight after the earthquake. Manetti's text is therefore an extremely important and reliable source: it supplies information on effects at 153 localities (although in a concise form). The first book of this treatise contains theoretical considerations on the causes of the earthquakes. The second book contains a catalogue of ancient earthquakes in the Mediterranean area with reference to the sources used, it is the earliest known catalogue of its kind for the West. The 1456 earthquake also inspired a treatise by Matteo dell'Aquila (ed. Figliuolo 1990), a contemporary author, but its attitudes are a vestige of late medieval thinking, and its treatment of the 1456 earthquake is more general.

ADMINISTRATIVE DOCUMENTS

As pointed out above, sources amongst public documents are very few, partly because king Alfonso of Aragon reacted so little, and did not carry out any substantial modifications to the administration of the kingdom, and partly because of the destruction or loss of documents in the Archivio di Stato in Naples, during the Second World War. Two royal privileges have been found in the Archivo de la Corona de Aragón in Barcelona, as well (*Cancillería*, Privilegiorum Neapolis, 2916, Privilege, 9 June 1457; 2917, Privilege, 29 July 1457).

The only evidence of initiatives undertaken by secular noblemen is a concession granted by the marquis of Pescara to the people of Castel di Sangro (in Balzano 1915).

Two documents found in the Archivio di Stato in Naples were presented respectively by Maria Caracciolo in relation to the feudal estate of Casalduni on the death of her brother Giovanni Lupo Caracciolo on 14 February 1457 and by Scipione Pandone in relation to the contea of Venafro on the death of his father Francesco Pandone on 9 March 1457. In the Archivio Segreto Vaticano there are documents issued by pope Calixtus III: one of these deeds is in favour of count Nicola di Monforte and dates to February 1457; the second is in favour of the cathedral church of Calvi and is dated 23 April 1457; the third is in favour of the abbey of Santa Maria di Realvalle and dates to May 1457; and the fourth, in favour of Paolo and Nicolò di Vallata, is dated 24 May 1457. These documents are quoted in Figliuolo (1988-89).

Amongst official documents there is a public record of earthquake effects, now among the parchments preserved in the Archivio Capitolare at Isernia (in Viti 1972, doc. XVIII).

NOTULAE

Witnesses with personal experience of the earthquake's effects wrote *Notulae* in the margin of monastic codices originating respectively in the Abbey of Montecassino (cod.47), the convent of S. Bernardino di Campi (Biblioteca Nazionale, Naples, V.H.135) and the abbey of S. Maria in Galdo Mazzocca (Biblioteca Apostolica Vaticana, *Vaticani Latini*, 5949). Also of importance is a *Notula* in a Hebrew religious manuscript (Jewish National and University Library of Jerusalem, *Heb. Ms.*, 38*, 4281)

CHRONICLES

Contemporary chronicles are also of considerable importance. Some contemporary chroniclers were in fact eyewitnesses of the earthquake: the notary Giacomo della Morte ("Notargiacomo") and the scholar Lorenzo Bonincontri at Naples; the notary Angelo Tummolillo at Cassino; Francesco d'Angeluccio and a monk called Alessandro

de Ritiis, at L'Aquila and San Clemente a Casauria respectively; the scribe Stefano Infessura, Paolo dello Mastro and cardinal Iacopo Ammannati Piccolomini in Rome. The narratives of three other chroniclers, furthermore, contain information drawn from first-hand accounts and are therefore very reliable. The chroniclers concerned are: Nicola della Tuccia, a prior from Viterbo, Giovanni di mastro Pedrino from Forlì, Matteo Palmieri, a Florentine spice merchant. For specific bibliographical references, see the sources referred to in the section "Earthquake effects by localities".

INSCRIPTIONS

Five inscriptions, two of which are now lost, make direct reference to this earthquake.

■ 1 – Ariano Irpino (province of Avellino), cathedral: an inscription recorded reconstruction work carried out by bishop Ursileo (in *Italia Sacra*, vol.8, 1721, col.217);

■ 2 – Orsara di Puglia (province of Foggia): an inscription on a stone architrave in a house (in Rosso 1907, p.195);

■ 3 – Tocco da Casauria (province of Pescara): an inscription is in the courtyard of the *palazzo ducale* records the destruction of the town and the death of the local lord (Magri and Molin 1984, fig.3, unnumbered page between 6 and 7 and p.158);

Two other late inscriptions concern restoration work at church buildings:

■ 4 – San Pietro Avellana (province of Isernia): an inscription of 1635 refers to the restoration of the chapel of S.Giovanni Battista (published in Figliuolo 1988-89, II, p.172);

■ 5 – Ariano Irpino, cathedral: an inscription of 1736, which still survives in Ariano cathedral, records the long series of earthquakes which struck the building between 858 [848] and 1732, and includes that of 5 December 1456.

Two more inscriptions tell of reconstruction work at churches, though they do not specifically refer to the earthquake.

□ 6 – Ripalimosano (province of Campobasso): a bronze inscription, now lost, recorded the rebuilding of the bell-tower of the parish church in 1463 (in Magri and Molin 1984, p.138).

□ 7 – Pescocostanzo (province of L'Aquila): an inscription carved into one of the wooden trusses over the nave of the collegiate church of S.Maria del Colle (published in Sabatini 1960, p.111) records its having been rebuilt.

POPULATION SOURCE

In order to locate the sites existing at the time of the earthquakes a census has been used (*Liber focorum Regni Neapolis*, ed. Cozzetto 1986) and the maps in *Rationes decimarum Italiae*. Population data for the localities struck by the earthquake have been taken from the *Liber focorum*. This document was in all probability drawn up after 1449 and before 1456. It provides data from the first fiscal census carried out by the Aragonese authorities in 1443. A later census of hearths was carried out in 1447, but only fragments have survived. In 1449, however, when taxes were increased, it was decided to return to the 1443 figures, which were evidently to the advantage of local communities.

Earthquake effects by localities, based only on primary sources

Set out below is a description of effects by town and village together with the text of the sources. The localities are listed in descending order of intensity of the effects experienced, up to and including grade VI MCS (see parameters on pp.721-23).

The subdivision of effects at the four source areas which, we suggest, became active almost simultaneously, can be found below.

There are frequent disparities between the sources as to the number of victims, so we choose to give the figure recorded in Manetti's treatise, on the grounds that it is the most reliable source. We record but do not transcribe the text of contemporary chronicles and Astesano's poem, except where these sources are the only ones available. In fact, 15th century chronicle sources do not provide nearly such substantial information as diplomatic correspondence, documentary evidence and inscriptions.

Apice (province of Benevento)

The buildings completely collapsed. Apice was a town of 345 hearths (estimated population: 1,725), and there were 1,000 victims (57.9%). The sources are eight letters sent between 7 December 1456 and 14 January 1457, two reports, Manetti's treatise, eight contemporary chronicles and Astesano's poem. The first letter is from Ercole d'Este to his brother Borso, and was sent from Foggia on 7 December 1456: "The castle of Canossa and part of the town have been laid flat; [...] Apice and many other places likewise".

Canossa lo castello e parte dela terra per terra; [...] Apici et molte altre terre pur il simile.

The second letter was sent from Naples on 9 December 1456 by ambassador Pere Dusany to the Catalan deputies: "Apice [...] and other places, all large, have been so badly damaged that they will never recover".

Apixi [...] e altres terres, totes grosses han pres tant dan que nunca tornaran.

The third letter was sent from Naples on 11 December 1456 by the Venetian ambassador, Bertuccio Contarini, to doge Francesco Foscari: "A fine town called Apice has been entirely destroyed, and all its inhabitants are dead".

Una terra bona se chiama Apezi tuta in terra, morti tuti.

The fourth letter was sent from Foggia on 12 December 1456, and was written by the Mantuan ambassador, to marquis Luigi III Gonzaga: "Apice, a town of about the same number of hearths [50], is similarly in ruins, and few have survived".

Apice, terra quasi de altri tanti fogni [50], similiter è ruinata, che pochissimi sono salvati.

The fifth letter was sent from Naples on 14 December 1456 by the Florentine merchant Paolo Rucellai to his brother Giovanni: "At Arpino [Apice], seven eighths of the inhabitants have been killed" (*A 'Rpino vi sono morti e' sette ottavi*).

The first report is attached to the letter of 22 December 1456 sent from Naples by the Milanese ambassador Antonio da Trezzo to duke Francesco Sforza: "Apice has been completely razed to the ground, and about 600 people have been killed".

Apice in tutto spianato et mancate circha persone 600.

The sixth letter was written to duke Francesco Sforza by the Milanese ambassador, Antonio da Trezzo, and was sent from Foggia on 28 December 1456: "But on my way here I saw Paduli and Ariano, towns whose fortresses have collapsed, and not a single house remains standing and the same is true of Apice, but I have not seen it".

Ma venendo quà ho veduto Padule et Ariano, nelle quale terre sonno cadute le fortezze et niuna casa è remasa in pede et cossi ad Apici, ma quello non ho veduto.

The seventh letter was sent from Naples on 14 January 1457 by Pier Candido Decembrio to Cicco Simonetta, secretary to the duke of Milan: "Apice is entirely in ruins, and about 600 people have been killed".

Apice in tuto expianato, morte circa persone VIc [600].

The eighth letter probably dates to January 1457, but the sender and recipient are unknown: "The towns of Troia, Apice, Ascoli di Puglia and that area have experienced a great earthquake. Many houses have collapsed, and there have been many victims; but no town has been completely destroyed".

La città di Troia, Apice, Ascoli in Puglia, e il paese hanno sofferto gran terremoto, e sono cadute molte case, e molta gente è rimasta morta; ma nessuna città è sprofondata.

The second report of unknown authorship, probably dates to January 1457, was sent to cardinal Prospero Colonna: "Alife, Apice [...] Biccari, have been either totally or largely destroyed".

Aliphe, Appici [...] Biccari, chi in abisso e chi ruinato in gran parte.

According to Manetti: "Apice was also completely destroyed, and about one thousand people are reckoned to have died there".

Apicium, etiam radicitus eversum, cum mille circiter personarum occisione conspicitur.

According to the chronicle of Pierozzi: "The place called Apice has been completely destroyed, and 1,020 people have lost their lives".

Apichi nuncupatum in totum desolatum, sublati per mortem MXX hominibus.

Of the other chronicles, those which provide the most detail are the *Notabilia temporum* of Angelo Tummolillo and the chronicle of Giovanni di mastro Pedrino of Forlì. Briefer reports appear in: the *Annales de Raimo*, the *Diurnali* known as "of the duke of Monteleone", the annals of Lorenzo Bonincontri, and the French chronicle of Mathieu d'Escouchy.

Ariano Irpino (province of Avellino)

Almost all its houses collapsed, as well as a large part of the fortress. Ariano was a town of 643 hearths (estimated population: 3,215), and there were 2,400 victims (74.6%).

The sources are 13 letters and three reports, sent between 7 December 1456 and January 1457, Manetti's treatise, two *Notulae* in the margins of liturgical codices, three inscriptions, 12 contemporary chronicles and Astesano's poem. The first letter is from Ercole d'Este to his brother Borso, and was sent from Foggia on 7 December 1456: "Ariano has been destroyed, and 8,000 souls have died there".

È submerso Ariano, nel quale è morto dele anime 8000.

The second letter was sent from Naples on 7 December 1456 by the Sieneese ambassador, Bindo Bindi, to the authorities of the Sieneese Republic: "Ariano and all its houses are in ruins, and more than 2,000 people have been killed".

Ariano cum tutti casali è ruynato e li è morto dele persone più de 2000.

The third letter was sent from Naples on 8 December 1456 by Giannozzo Manetti to his brother Filippo: "What follows is an account of the castles and villages which have been struck by this scourge: [...] Ariano is almost completely reduced to ruins, for it has suffered more damage than anywhere else".

Quello che seguirà sarà il significato delle chastella e delle terre che questo fragello à percosse: [...] Ariano quasi tutto in terra, che è quello luogo che à ricevuto magiore danno che tutti quanti gli altri.

The fourth letter was sent from Naples on 8 December 1456 by Giannozzo Manetti to Vespasiano da Bisticci. It states that Ariano (*Arriano*) is one of the places that the earthquake "has struck to a greater or lesser extent, causing varying amounts of damage according to the vulnerability and position of the places concerned, for in some of the above-mentioned villages it seriously damaged their walls, in others it demolished houses, and yet others collapsed into the ground, thereby killing many people".

ha percosso variamente, et facto varij danni secondo la debolezza et sito de' luoghi, peroché a parte delle terre predecite ha frachassate le mura, a parte rovinato delle case et a parte sprofondatole con grande occisione di molte persone.

The fifth letter was sent from Naples on 8 December 1456 by Paolo Rucellai to his brother Giovanni: "Ariano has been laid flat, and three quarters of its inhabitants have been killed; they say that no more than 10 houses have been left standing".

Ariano spianato e mortovi e' tre quarti della gente; diciesi non v'è restate oltra 10 chase in piè.

The sixth letter was sent from Naples on 9 December 1456 by ambassador Pere Dusany to the Catalan deputies: "Ariano, a town of more than a thousand hearths, has been completely destroyed; an incredible number of people have been killed".

Ariano, terra de mes de mil fochs, s'es tota dirruida; ha y morta tanta de gent que no es de dir.

The seventh letter was sent from Naples on 11 December 1456 by the Venetian ambassador, Bertuccio Contarini, to doge Francesco Foscari: "Ariano and its castle have been completely razed to the ground, and a third [of the inhabitants] have been killed".

Ariano cum el castello tuto per terra, morto un terzo.

The eighth letter was sent from Foggia on 12 December 1456 and was written by the Mantuan ambassador, to marquis Luigi III Gonzaga: "The large town of Ariano, which is similar to and near the above-mentioned place [Apice], and has 1,800 hearths, is completely reduced to ruins, as is the castle, which was a very strong building, and so few have survived there that it is commonly held that 7,000 souls have perished — the most dreadful and heart-breaking disaster that anyone has ever seen or heard of".

Simile e proximo a suprascripto [Apice], Arriano, città grossa 1800 fochi, è del tutto ruinata, e 'l castello, che era fortissimo edifitio, et de quello sono campate poche persone, adeo che comune opinione è che li sono perite delle anime 7000, che a vedere è il più terribile e lacrimabile caso che mai fusse audito et veduto.

The ninth letter was sent from Naples on 14 December 1456 by the Florentine merchant Paolo Rucellai to his brother Giovanni: "The viscount of Ariano has written to the count of Ariano, who is here, to say that of the approximately 9,000 souls who lived there, only 1,500 have survived, the remainder having perished. And about two thirds of the town fortress, an impregnable building, have been swallowed up by the earth, one part having split open and collapsed on one side, and another on the other".

Scrive il vecie conte d'Ariano al conte d'Ariano, che ssi truova qui, che non v'è restate 1500 anime di circha a 9000 ne faceva la terra, tutto il resto sono morti. E lla forteza della terra che era cosa innispungniabile ita sotterra circha e' duo terzi, i rresto apertosi e chaduto una parte in qua e una i llà.

The tenth letter was sent from Rome on 18 December 1456, but the sender and recipient are unknown: "But in the *contado* and in the kingdom too, castles, towns, villages and innumerable country houses have been reduced to ruins; and amongst them, Ariano is particularly mentioned, and two other towns whose names I have forgotten, since they are outside the kingdom. And not one stone remained upon another there".

In comitatu autem, seu regno, castra, oppida, ville et infinite domus per campos usque ad rasuram terre ruinate sunt, ex quibus specialiter nominatur Arrianum et duo alia oppida quorum nomina, quia extranea sunt, perdidit. Nec remansit in illis lapis super lapidem.

The first report is attached to the letter of 22 December 1456 sent from Naples by the Milanese ambassador Antonio da Trezzo to duke Francesco Sforza:

"Scarcely a house remains standing at Ariano, and most of the people and mules who lived there have been killed, amounting to far more than 600".

Ariano non è quasi remasta casa in pede et morte la mazore parte deli homini che li habitavano et muli più de 600.

The eleventh letter was sent from Foggia on 28 December 1456 by the Milanese ambassador, Antonio da Trezzo, to duke Francesco Sforza: "But on my way here I saw Paduli and Ariano, towns whose fortresses have collapsed, and not a single house remains standing".

Ma venendo quà ho veduto Padule et Ariano nelle quale terre sonno cadute le fortezze et niuna casa è remasa in pede.

The twelfth letter was sent from Naples on 14 January 1457 by Pier Candido Decembrio to Cicco Simonetta, secretary to the duke of Milan: "Ariano is entirely destroyed [...] all the houses lie in ruins against each other [...], most of the people and mules, six hundred or more, have been killed".

Ariano per tuto ruinato [...] l'una casa iace adosso l'altra [...] morti la maiore parte deli habitanti e muli circa VIc [600] o più.

The thirteenth letter probably dates to January 1457, but the sender and recipient are unknown: "The town of Ariano is also [completely destroyed], and many people were killed there".

Anche la città di Ariano [tutto guassto], e molte persone vi rimasero morte.

The second report of unknown authorship, probably dates to January 1457, was sent to cardinal Prospero Colonna: "Ariano is largely in ruins, and 1,200 people have been killed there" (*Ariano è ruinato in maior parte, e morte persone 1200*).

The author of the third report, written at Naples, very probably in February 1457, was a Florentine citizen called Goro di Giovanni: "The town of Nola [...] Gaeta, Ariano; all these towns and castles have been badly damaged in these earthquakes, and so have the churches and chapels inside them, as well as many palazzi and towers".

La città di Nola [...] Ghaeta, Ariano; tutte queste città e chastella furono per i detti tremuoti malamente perchose, e simile le chiese e oratori che dentro vi sono, e molti de li palagi e torri.

According to Manetti: "[...] Ariano [...]: was almost completely razed to the ground, including its tall, splendid and impregnable fortress, and about 2,400 people met their deaths there in that dreadful tragedy. It was a terrible sight for all the individuals and groups of travellers who passed that way!".

[...] Arianum [...]: a fundamentis pene eversum una cum illa alta et admirabili atque inexpugnabili arce et simul cum duorum milium et quadringentorum circiter hominum pernicie; terribile atque perhorrendum spectaculum cunctis viatoribus et singulis transeuntibus manifestissime extat.

According to the chronicle of Pierozzi: "The noble town of Ariano has collapsed in ruins and 1,313 of its inhabitants have been killed".

Arianum, notabile oppidum, usque ad fundamenta contritum, mortuis ex eo MCCCXIII.

Information about the earthquake is also to be found in two *Notulae* in the margins of codices. The more detailed of the two was written by a friar called Romano Paoli in the margin of a liturgical codex from the monastery of Ss. Elia e Anastasio at Carbone, near Lagonegro (in Perrone Capano Compagna 1983, p.38, no.7): "In the year 1456 since the Incarnation of Our Lord Jesus Christ, in the fifth indiction, there was an earthquake throughout the world, which destroyed parts of Naples and Ariano and many other towns and castles, because of the great comet which appeared, at the time of pope Calixtus III, during the reign of the noble king Alfonso of Aragon, on Sunday 5 December; written by me, brother Romano".

Anno incarnationis 1456 de lu nostru signori Jesu Cristu, 5 indictionis, foi lo terramotu per tutto lu mundu a ddiguastanse parti de Neapoli e d'Arianu e mmulti autri citati e ccastella, per lla cometa grande chi parse, in tempo de papa Calisto terzio, regnanti lu serennissimu rre Alfonsu de Raona, de dia de dominica, ali cinqu de dechemre; per me frate Romanos.

In the margin of a collection of sermons by Bernardino da Fossa, there is a briefer *Notula*, written by a monk from the monastery of S. Bernardino at Campi (Biblioteca Nazionale, Naples, V.H.135, fol.1v): "In the territory of Alife, the town of Ariano was plunged into the waters".

Terra Aliffi, Civitas de Viano profundata est in aqua.

The earthquake is also recorded in three inscriptions, two of which are now lost. The first of these was formerly in Ariano cathedral, and recorded reconstruction work carried out by bishop Ursoleo (*Italia Sacra*, vol.8, col.217): "The mountain was moved and brought down, and a malign movement of the earth brought down the castle at a stroke, destroying houses as well. At night, the dreadful [earthquake] sent two thousand men to their grave. Bishop Ursuleo skilfully escaped death and restored altars and churches, which he will donate to the people who supported him. On the Nones of December [5 December], during the reign of king Alfonso and under count Enrico".

Fertur in obruptum mons motus improbus ictu / terrae castrum subvertit, aedesque dejecit. / Bis hominum mille nocte dirus ille tradidit urnae. / Ursus Leo Praesul, populoque fovente daturus / evadit sagax aras et templa restaurans. / Nonis Decembris 1456 sub Divo Alfonso regnante Henrico comite.

The second inscription was on a stone architrave in a house at Orsara di Puglia (Rosso 1907, p.195), and read: "In 1456 there was a great earthquake, and Ariano collapsed in ruins".

MCCCCLVI fuit terremotus magnus, et ruit Arianum.

The third is a late inscription, dating to 1736, which still survives in Ariano cathedral. It records the long series of earthquakes which struck the building between 858 [848] and 1732, and includes that of 5 December 1456 (Pantosti and Valensise 1989, p.547). Earthquake effects at Ariano are also recorded in the following chronicles: the *Annales de Raimo*, the *Annales Forolivienses*, the *Diurnali* known as "of the duke of Monteleone", the annals of Lorenzo Bonincontri, the French chronicles of Jean Chartier and Mathieu d'Escouchy, the *Notabilia temporum* of Angelo Tummolillo, the *Cronaca di Viterbo* of Nicola della Tuccia, the chronicle of Giovanni di mastro Pedrino of Forlì, the *Dietari* of Melchior Miralles, the annals of Matteo Palmieri.

Bojano (province of Campobasso)

Almost all its buildings collapsed, including the fortress. Bojano was a town of 270 hearths (estimated population: 1,350), and there were 1,200 victims (88.8%).

The sources are two reports and a letter dating to December 1456 and January 1457, Manetti's treatise, two contemporary chronicles and Astesano's poem, and two documents dated 9 March 1457 and 18 April 1458. The first report is attached to the letter of 22 December 1456 sent from Naples by the Milanese ambassador Antonio da Trezzo to duke Francesco Sforza: "Bojano has been razed to the ground and almost all its inhabitants have been killed".

Boyano spianato et quasi morti tutti li habitanti.

The letter was sent from Naples on 14 January 1457 by Pier Candido Decembrio to Cicco Simonetta, secretary to the duke of Milan: "Bojano is entirely in ruins and most of the inhabitants have been injured or killed".

Boiano spianato tuto e li habitanti per la maiore parte consumpti e morti.

The second report of unknown authorship, probably dates to January 1457, was sent to cardinal Prospero Colonna: "Bojano has been swallowed up".

Boiano andato in abisso.

According to Manetti: "Boviano is an ancient and once wealthy town, now called Buiano [Bojano] for reasons of euphony. Not only did the town and its castle completely collapse but, more surprisingly, it was completely submerged by the waters which surrounded it on every side, and it mourned more than one thousand two hundred dead. [...] Boviano recently so cruelly swallowed up into a chasm in the earth".

Bovianum vetusta olim et opulenta urbs, nunc autem euphorie causa Buianum nuncupata, non solum cum arce sua penitus corruit, sed etiam, mirabilis est, totum aquis undique circumstantibus obrutum, ultra ducentos supra mille mortales desideravit. [...] Boviano ita crudeliter hiatu terre nuper absorto.

According to the chronicle of Pierozzi: "After the town of Bojano collapsed, it was submerged by the waters which rose out of the ground because of the earthquake, and 1,300 people spent their last day there".

Civitas Buiani post ruinam submersa est aquis surgentibus ex terra per terremotum, MCCC extremum diem claudentibus ibi.

The following two documents are partially transcribed in Figliuolo (1988-89). The first dates to 9 March 1457 (Archivio di Stato, Naples, *Significatorie dei Relevi*, I, 1456-67, fol.47) and records that: "the town of Bojano is said to have been completely destroyed in the earthquake".

Civitas Boiani, quod asseritur fuisse propter terremotum totaliter ruynatum.

In the second document, which dates to 18 April 1458 (it is summarised in an 18th century manuscript in the archive of Campobasso cathedral, *Regesti Gallucci*, 18, no.57), the *procuratori* of the church of S.Bartolomeo at Bojano rent to Giovanni Barone a cottage and small garden belonging to the church and situated in the parish of S.Martino: "the said cottage was damaged in the earthquake, for an annual rent of ten *grana*".

qual casalino era diruto per lo terremoto, dietro corresponsione del censo annuo di dieci grana.

Earthquake effects at Bojano are also recorded in the following chronicles: the *Notabilia temporum* of Angelo Tummolillo and the *Cronaca di Viterbo* of Nicola della Tuccia.

Isernia

Almost all its buildings collapsed. The cathedral and all the other churches were badly damaged. Isernia was a town of 407 hearths (estimated population: 2,035), and there were 1,500 victims (73.7%). The sources are four letters and two reports dating to December 1456 and January 1457, a *Notula* in the margin of a codex, Manetti's treatise, a petition dated 28 January 1458, two parchments and six contemporary chronicles. The first letter was sent from Foggia on 12 December 1456, and was written by the Mantuan ambassador, to marquis Luigi III Gonzaga: "And they say the same of Isernia [as of Castel di Sangro: it was completely reduced to ruins, and almost everybody perished]".

Et similiter se dice de Sergno [al tutto esser ruinato, e quasi tutti li huomini esser periti].

The second letter was sent from Naples on 14 December 1456 by the Florentine merchant Paolo Rucellai to his brother Giovanni: "Sarni [Isernia] [...] had 4000 souls or more, but only about 300 remain, for the rest have all been killed".

Sarni [...] che facieva anime 4000 o più, ve n'è restati circha a 300, il resto tutti morti.

The first report is attached to the letter of 22 December 1456 sent from Naples by the Milanese ambassador Antonio da Trezzo to duke Francesco Sforza: "Isernia has been completely razed to the ground and about 1,200 people have been killed".

Sergna tutta in terra et morte circha persone 1200.

The third letter was sent from Naples on 14 January 1457 by Pier Candido Decembrio to Cicco Simonetta, secretary to the duke of Milan: "Segna is entirely in ruins and more than a thousand people have been killed".

Segna è ruinata tuta e morte più da mille persone.

The fourth letter probably dates to January 1457, but the sender and recipient are unknown: "Isernia, a large city in Campania, has been completely destroyed".

Sergina, una gran città della Campania, totalmente sprofondata.

The second report of unknown authorship, probably dates to January 1457, was sent to cardinal Prospero Colonna: "At Isernia, no more than 19 people have survived".

Sergna non sono scampate se non persone XVIII.

The *Notula* is in the margin of codex 47 in the Archivio dell'Abbazia of Montecassino: "Indeed, Gaeta [...] Isernia [...] and castles, churches and villages in Abruzzo have suffered terrible damage, to the extent that in some places or castles only a single house remains standing, while at others only four are left, and in yet others ten, and in some places castles have been submerged and swept away in the rushing waters".

Verum Gajete [...] Isernia [...] et in Aprutio castra, ecclesie, ville, mirabiliter ruerunt, sic ut in quibusdam locis vel castris sola domus remansit, alibi quatuor domus, ubi vero decem, nec non et alibi aquis rapientibus castra submersa extiterunt.

According to Manetti: "Isernia [...] has completely collapsed, and it is believed that the collapse led to so many and widespread deaths that it is reckoned that about one thousand five hundred people are being mourned".

Sernia [...] funditus eversa tantam et tam ingentem suorum incolarum stragem sua ruina intulisse, iure existimatur et creditur ut supputata ratiuncula mille quingenti circiter homines desiderati referantur.

Pierozzi records: "The town called Descivi [Isernia] on the Abruzzo border, has also completely collapsed, and the disaster has caused the death of 1,200 people there".

civitas que dicitur Descivi in confinibus Abrutii, usque ad fundamenta exinanita est, ubi et mille CC ex ruina illa ex hoc mundo transierunt.

The serious state of the town is referred to in a petition, dated 28 January 1458, from its *sindaci* to king Alfonso of Aragon (in Gentile 1910, pp.668-9): "In the first place, leaving on one side the story of the disaster that struck the town, which has been reduced to ruins and laid waste by the terrible earthquake, and most of its citizens and people have been killed, as is well known, we humbly beg [...]".

In prima omissa la narratione della Ruyna de quella cita la quale tucta dalli proprii fundamente e caduta et desolata per lo horrebile terremoto et la maior parte delli citatini et persone sonno morte, come e notorio, Supplicamo devotamente [...].

There is a parchment preserved in the Archivio Capitolare at Isernia (ed. Viti 1972, doc. XVIII, p.385), containing a very vivid and impressive account of the effects and social repercussions of the earthquake: "And our town of Isernia was completely laid waste and shaken, and all its buildings, from the greatest to the least, were reduced to ruins, and the cathedral was completely ruined and shaken and none of the other churches in the town were left undamaged. And during that night about eight hundred people — that is to say those who were not killed — were left scarred and injured, mostly from having been crushed under stones as a result of the great damage inflicted by the earthquake. When morning came, all those who had survived left the town, for they feared that they would not survive the continuing shocks. Subsequently, because the land was so laid waste and devastated, no-one dared to stay or linger in the town, so

great was their fear. Furthermore, six parts of the town in which houses had been destroyed caught fire, and many dead bodies were burned and reduced to ashes. Then people who lived outside the town or in the castles of the surrounding area came and took away all our belongings, our money, gold and silver and all our surviving possessions. This was during the reign of king Alfonso of Aragon and Sicily”.

Et Civitas nostra Aeserniae totaliter fuit ruinata, et conquassata, et omnia aedificia à majore usque ad minus projecta in terram, Templum divini cultus totaliter fuit ruinatum et conquassatum, et aliarum Ecclesiarum praefatae civitati nulla remansit incolumis. Nec non in dicta Civitate mortui prae magno terraemotu in illa nocte circa octingenti homines. Illi autem qui remanserunt, erant pleni cicatricibus, vulnerati etiam pro majori parte reclusi sub lapidibus pro magna ruina terremotus. Mane autem facto, omnes illi qui vivebant, exierunt de civitate, eo quod timebant, ne suffunderetur propter continuationem terraemotuum, postmodum quod terra erat ita desolata, et devastata, nullus audebat stare, vel morari in ea prae timore magno. Praeterea praefata civitas succensa fuit in ruinatione domorum in sex partes et combusta, seu cremata fuerunt multa corpora mortuorum. Imposterum venerunt forenses, et castrenses, qui erant in circuito nostro, et abstulerunt omnia suppellectilia, nostram pecuniam, aurum et argentum, et caetera cuncta bona restantia. Regnabat tunc in diebus illis Rex Alphonsus de Aragona Siciliae citra et ultra.

Since the city had suffered serious damage, king Alfonso of Aragon confirmed its privileges in a document dated 29 July 1457, which includes the following statement: “we have been humbly petitioned by the community [...] of Isernia [...], that, in our kindness, we should deign to allow the continuance of that third part of the above-mentioned permission granted to the said community, so that the town walls may be rebuilt, for they were struck by the great earthquake and lie in almost total destruction. [...] Given in Castelnuovo in our city of Naples on 29 July in the fifth indiction in the year 1457 since the birth of Our Lord”.

supplicatum est nobis humiliter pro parte universitatis [...] Ysernie [...] ut ex nostra benignitate eam ipsam tertiam partem provisionis memorate eidem universitati, gratia quidem muros eius civitatis reformandi, cum, iam pridem ingenti terremotu percussi, ad terram pene undique iacerent labefacti concedere dignaremur [...]. Datas in Castellonovo civitatis nostre Neapolis die vicesimo nono mensis Julij quinte indictionis anno a nativitate domini Millesimo CCCCLVIJ^o.

There is another parchment, dated 15 March 1478 and written at Isernia (Archivio di Stato, Naples, *Pergamene della Società di Storia Patria*, 10.CC.III, no.14), which certifies that Lembo de Chyobilita renounces the lease on a house in Isernia owned by the local Church, because it has been reduced to ruins in the earthquake. Earthquake effects at Isernia are also recorded in the following chronicles: the L'Aquila chronicles of Francesco D'Angeluccio and Alessandro de Ritiis, the *Notabilia temporum* of Angelo Tummolillo, the *Cronaca di Viterbo* of Nicola della Tuccia, and the Brescian chronicle of Corradino di Palazzo.

Paduli (province of Benevento)

Almost all its buildings collapsed, including the fortress. Paduli was a town of 275 hearths (estimated population: 1,375), and there were 1,300 victims (94.5%). The sources are 11 letters written between 6 December 1456 and 14 January 1457, three reports of unknown authorship, Manetti's treatise, and two contemporary chronicles. The first letter was written to duke Francesco Sforza by the Milanese ambassador, Antonio da Trezzo, and was sent from Naples on 6 December 1456: “Messer Jacomo Carbone, who possessed a castle called Paduli not far from Benevento, has had that castle reduced to ruins, and three of his children are amongst the victims”.

A meser Jacomo Carbone, che haveva uno castello chiamato Padule verso Benevento, è ruynato dicto castello et fra l'altri a luy sonno morti tri figlioli.

The second letter is from Ercole d'Este to his brother Borso, and was sent from Foggia on 7 December 1456: "Another town, called Paduli, had 3,000 souls, but they have all been killed".

Un'altra terra che se domanda Padule, la quale facea dele anime 3000, le quale sono tutte morte.

The third letter was sent from Naples on 8 December 1456 by Giannozzo Manetti to his brother Filippo: "What follows is an account of the castles and villages which have been struck by this scourge: [...] At Sant'Agata and Paludi, which are two castles, it did likewise [they were badly damaged]".

Quello che seguirà sarà il singnificatio delle chastella e delle terre che questo fragello à percosse: [...] a Sancta Agata, alla Palude, che ssono due chastella, à fatto il simile [à ricevuto magiore danno].

The fourth letter was sent from Naples on 8 December 1456 by Giannozzo Manetti to the Florentine Signoria: Paduli (la Palude) is one of the places where the earthquake "has done a good deal of damage, depending on the nature of the sites and the quality of the buildings; and a huge number of inhabitants have fled".

pro Universitate
Civitatis Isernie.

Alfonso et c. Universis et singulis personis nec non legatis inspecturis
tam presentibus quam futuris. Superioribus annis concessimus dilectis et fide-
libus nostris Antonio de marzio homifero marzicote et Landolfo de uctulis
de Civitate nostra Isernie super exigentibus iuribus precensionem annuam
duodecim ex obolidas super iuribus et Cabellis nris dicit Civ-
tatis nostre Isernie. qdum in hac vna manerent: prout her et alia
in quodam nro privilegio sub data in felicia nro exercitu apud villa
sancte Marie maioris die ducesimo septimo mensis novembris quate-
decime indictionis anno domini. M. CCCC. LXX. et ceteris expedito
latius sunt contenta. Et quoniam prefatus homifero marzicote
qui tertiam partem eius precensionis duodecim anno quolibet
dum viveret habebat et percipiebat elapsis proxime diebus et vna
decessit supplicatum est nobis humiliter pro parte Universitatis
et proborum hominum Civitatis Isernie prefate ut ex nra benignitate eam
ipam tertiam partem precensionis memorate eidem Universitati: gra-
quidem iuribus eius Civitatis reformandi: cum eam pridem iugiter
revertorū percipere ad tertiam partem undiq. vacarent labefacti concedere
dignaremur. Nos equidem eam ipam pijs oculis inspiciendo: sumus

fig. 121 The king Alfonso of Aragon confirms the privileges of the town of Isernia, which had been badly affected by the 1456 earthquake. The document was written at Naples, and bears the date 29 July 1457; it is now at Barcelona, in the Archivo de la Corona de Aragón (Cancillería, Privilegiarium Neapolis, 2917, fols.169v.).

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*pro Universitate
Civitatis Isernie.*

Alfonso et c. Universis et singulis personis meas meas inspecturis
tam presentibus quam futuris. Superioribus annis concessimus dilectis et fide-
libus nostris Antonio de marzio, bonifacio marzocco, et Landolfo de uctulis
de Civitate nostra Isernie suis exigentibus meritis provisionem annuam
duodecim exducentarum super meribus et cabellis nostris dicitur Civi-
tatis nostre Isernie. quod in hac parte manent: prout heret et alia
in quodam nostro privilegio sub data in felix nostro exercitu apud villa
sancte Marie maioris die vicesimo septimo mense Novembris que-
decime Indictionis anno domini M.CM.LXXVI. Et quoniam prefatus bonifacio marzocco
qui tertiam partem eius provisionis duodecim annuam quolibet
dum viveret habebat et percipiebat. clapsis proxime diebus et hora
decessit supplicatum est nobis humiliter pro parte Universitatis
et pro bonorum hominum Civitatis Isernie prefate ut ex nostra benignitate eam
ipsum tertiam partem provisionis memorate eidem Universitati. gratia
quidem meritis eius Civitatis reformandi. cum iam pridem ingenti
terremotu percussis ad tertiam partem undique iacentibus labefacti concedere
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à fatti varii danni, secondo la varietà de' siti e lla qualità d'edificii, e grande e innistimabile 'vasione degli abitanti.

The fifth letter was sent from Naples on 8 December 1456 by Giannozzo Manetti to Vespasiano da Bisticci. It states that Paduli (*La Palude*) is one of the places where the earthquake "has struck to a greater or lesser extent, causing varying amounts of damage according to the vulnerability and position of the places concerned, for in some of the above-mentioned villages it seriously damaged their walls, in others it demolished houses, and yet others collapsed into the ground, thereby killing many people".

ha percosso variamente, et facto varij danni secondo la debolezza et sito de' luoghi, peroché a parte delle terre predecite ha frachassate le mura, a parte rovinato delle case et a parte sprofondatole con grande occisione di molte persone.

The sixth letter was sent from Naples on 8 December 1456 by the Florentine merchant Paolo Rucellai to his brother Giovanni: "Iacopo Carbone's Paduli has been razed to the ground and three of his children have been killed, as well as many other people".

La Padula d'Iacopo Charbone tutta spianata e mortovi tre suoi figliuoli e molti altri.

The seventh letter was sent from Naples on 9 December 1456 by ambassador Pere Dusany to the Catalan deputies: "Paduli, a place of more than 400 hearths, has been completely razed to the ground, killing 19/20 of the inhabitants; and all the children of the lord of the place, a gentleman of Capuana, have been killed, while he happened to be here".

La Padula, terra de mes de CCCC. fochs, n'es anat tot per terra, e morta de les XX. parts de la gent les XVIII.; e morts tots los fills del senyor de la terra, lo qual es gentil hom de Capuana, lo qual s'es trobat aci.

The eighth letter was sent from Naples on 11 December 1456 by the Venetian ambassador, Bertuccio Contarini, to doge Francesco Foscari: "At another [place] called Paduli, everyone has been killed".

Un'altra [terra] se chiama Padula, morti tuti.

The ninth letter was sent from Foggia on 12 December 1456, and was written by the Mantuan ambassador, to marquis Luigi III Gonzaga: "As I carried on [towards Foggia] on the following Sunday [5 December 1456], I saw that Paduli, a sound and fine castle of about 50 hearths, has been completely destroyed. Not a single church or house survived, inside or outside, and almost all the inhabitants were killed, for we are told that only 50 or 60 souls survived. A nearby strong and handsome fortress was similarly destroyed, killing all the sons and a daughter of Giacomo Garbo, the lord of the place, who was at Naples at the time, as well as everybody else who happened to be inside".

Nel mio venire inanti, la domenica sequente, vite la Padula, bono et bello castello de circha fogi 50, esser ruinato tutto, che né chiese né una sol casa, dentro né de fuora, se salvò, con uno interrto quasi de tutti li habitanti, che se affirma non esser salvate anime 50 o 60. Similiter ruinò una bella et forte rocha che li era, nella qual morino tutt'i figlioli e una figliola de Giacomo Garbo, signor de quello luogo, che era a Napoli, con tutti li altri che se li ritrovono drento.

The first report is attached to the letter of 22 December 1456 sent from Naples by the Milanese ambassador Antonio da Trezzo to duke Francesco Sforza: "Paduli has been completely destroyed and scarcely anyone has survived".

Padule è totalmente ruynato et quasi non è campata persona.

The tenth letter was sent from Foggia on 28 December 1456 by the Milanese ambassador, Antonio da Trezzo, to duke Francesco Sforza: "But on my way here I saw Paduli and Ariano, places whose fortresses have collapsed, and not a single house remains standing".

ma venendo qua ho veduto Padule et Ariano, nelle quale terre sonno cadute le forttezze et niuna casa è remasa in pede.

The eleventh letter was sent from Naples on 14 January 1457 by Pier Candido Decembrio to Cicco Simonetta, secretary to the duke of Milan: "Paduli lies completely in ruins, and nobody wants to live there any more".

Padule totalmente ruinato e non è ristato persona che se cura d'abitarli.

The second report of unknown authorship, probably dates to January 1457, was sent to cardinal Prospero Colonna: "Paduli is completely destroyed, and 1,417 people have been killed".

Padula ruinata tutta e morte persone 1417.

The author of the third report written at Naples, very probably in February 1457, was Goro di Giovanni, a Florentine citizen: "The city of Benevento, Paduli [...] all these towns and castles have been badly damaged in these earthquakes, and so have the churches and chapels inside them, and many *palazzi* and towers".

La città di Benevento, la Palude [...] tutte queste città e chastella furono per i detti tremuoti malamente perchose, e simile le chiese e oratori che dentro vi sono, e molti de li palagi e torri.

According to Manetti: "Paduli [...] completely collapsed in ruins, and 1,600 people of all ages and both sexes were crushed to death, so we have been informed".

Padulium [...] cum sexcentis supra mille cuiuscunque etatis et utriusque sexus obtritis mortalibus, funditus corruisse novimus.

According to the chronicle of Pierozzi: "The town or castle called La Palude [Paduli], has completely collapsed and, what is more dreadful, 1,033 people have lost their lives".

Civitas, que dicitur Lapalude seu castrum, usque ad fundamenta collapsa est et, quod magis dolendum est, homines MXXXIII oppressione ex hac luce subtracti.

Earthquake effects at Paduli are also recorded in the following chronicles: the *Annales de Raimo*, the French chronicles of Jean Chartier and Mathieu d'Escouchy, the *Notabilia temporum* of Angelo Tummolillo, the *Cronaca di Viterbo* of Nicola della Tuccia, the chronicle of Giovanni di mastro Pedrino of Forlì, the *Dietari* of Melchior Miralles, and the annals of Matteo Palmieri.

Pesco Sannita [formerly **Pescolamazza**] (province of Benevento)

Almost all its houses collapsed. Pescolamazza was a village of 39 hearths (estimated population: 195), and there were 130 victims (66.6%). The sources are a report dating to January 1457, Manetti's treatise, the contemporary *Cronaca di Viterbo* of Nicola della Tuccia and Astesano's poem. The report of unknown authorship, probably dates to January 1457, was sent to cardinal Prospero Colonna: "Pescasolo [Pescolamazza] has been destroyed, except for two houses, and 250 people have been killed".

Pescasolo ruinato excepto do case, e sono morte persone 250.

According to Manetti: "Pescosannita [Pescolamazza] collapsed to the ground, killing about one hundred and thirty people".

Pisthosomnolum, funditus eversum, centum et triginta circiter personas interemit.

San Lupo (province of Benevento)

Most of its houses collapsed. The sources are a letter dated 7 December 1456, the contemporary chronicle of Jean Chartier and Astesano's poem. The letter is from Ercole d'Este to his brother Borso, and was sent from Foggia on 7 December 1456:

"The *contado* of Molise, that is to say Campobasso [...] San Lupo [...] and many other towns have been reduced to ruins, and all their inhabitants killed".

Il contado de Molixe, cioè Campobasso [...] San Lupo [...] e molte altre terre sono submerse cum tuta zente.

Caramanico Terme [formerly Caramanico] (province of Pescara)

A large proportion of its houses collapsed. The sources are a report dating to January 1457 and Astesano's poem. The report of unknown authorship, probably dates to January 1457, was sent to cardinal Prospero Colonna: "The whole of Castel di Caramanico has suffered ruin and destruction".

Castel de Caramanica è tuto ruinalo e disfato.

Circello? (province of Benevento)

Almost all its houses collapsed. There were many victims. We think the place names given as *Sergiello* and *Sergnel* can probably be identified as Circello, though some doubt remains. The sources are a report and a letter dating to 22 December 1456 and 14 January 1457. The report is attached to the letter of 22 December 1456 sent from Naples by the Milanese ambassador Antonio da Trezzo to duke Francesco Sforza: "Circello [?] is entirely in ruins; a son and daughter of the [local] lord have been killed, together with many others".

Sergiello tutto in terra, morto uno figliolo et una figliola del signore et molti altri.

The letter was sent from Naples on 14 January 1457 by Pier Candido Decembrio to Cicco Simonetta, secretary to the duke of Milan: "The village of Circello [?] lies in ruins; the local lord has been killed along with his son and a daughter and many other inhabitants".

El locho de Sergnel tuto è abatuto a terra e morto el signore cum lo figlio et una fiola e molti altri habitanti.

Civitella Licinio (province Benevento)

A large proportion of its houses collapsed. The sources are a report dating to January 1457 and Astesano's poem. The report of unknown authorship, probably dates to January 1457, was sent to cardinal Prospero Colonna: Civitella is included in a list of places which suffered damage, but the author does not specify the extent of the damage.

Acquaviva d'Isernia (province of Isernia)

Most of its buildings collapsed. Acquaviva was a village of 32 hearths (estimated population: 160), and there were 40 victims (25%). The sources are a letter probably dating to January 1457, Manetti's treatise, the chronicle of Pierozzi and the contemporary Brescian chronicle of Corradino di Palazzo. The sender and recipient of the letter probably dating to January 1457 are unknown: "the town of Acquaviva and its castle have completely [collapsed], with the result that you cannot tell what used to be there".

La città di Acquaviva col castello della città tutto sprofondato che non si riconosce cosa fusse sul luogo.

According to Manetti: "Acquaviva (as it is commonly called) completely collapsed, crushing about forty people to death".

Aquaviva, sic enim trito sermone vocitatur, funditus ruens, quadraginta circiter mortales oppressit.

The chronicle of Pierozzi gives a slightly smaller number of victims than Manetti: "The whole of Acquaviva has been damaged, and 35 people have lost their lives".

Aqua viva tota quassata XXXV de hac luce subtracti sunt.

Bonito (province of Avellino)

Almost total collapse of its buildings and fortress. Bonito was a village of 31 hearths (estimated population: 155), and there were 40 victims (25.8%). The sources are Manetti's treatise and the chronicle of Pierozzi. According to Manetti: "Bonito and its fortress were completely destroyed, and about forty people died in the ruins".

Bonitium, una cum arce omnino laceratum, quadraginta circiter personas obrivit.

The picture of effects given in the chronicle of Pierozzi clashes with that given by Manetti: Bonito (*Bunitu*) is included as one of the places which "suffered appreciable harm in these earthquakes [...] they were not very badly damaged, and we are not told the number of victims there".

notabile detrimentum receperunt ex ipsis terremotibus [...] non tantam ruinam passe sunt, numerus defunctorum non habetur descriptus.

Casalciprano (province of Campobasso)

Almost all its houses collapsed. Casalciprano was a village of 87 hearths (estimated population: 435), and there were 170 victims (39%). The sources are Manetti's treatise, the contemporary chronicle of Pierozzi and the *Cronaca di Viterbo* of Nicola della Tuccia. According to Manetti: "The large village of Cretendio [Casalciprano] collapsed in ruins, crushing one hundred and seventy inhabitants to death".

Cretendium, magnus vicus, funditus eversus, centum et septuaginta incolas suo casu occidit.

According to the chronicle of Pierozzi: "The village of Cretande [Casalciprano] has been razed to the ground, and 160 people there have gone to meet their Lord".

Casale Cretande terre coequata est, ubi et CLX ad Dominum migravere.

Casalduni (province of Benevento)

Most of its houses collapsed. Casalduni was a village of 42 hearths (estimated population: 210), and there were 75 victims (35.7%). The sources are two letters and a report dated 7 and 22 December 1456 and 14 January 1457, a document dated 14 February 1457, Manetti's treatise, two contemporary chronicles and Astesano's poem. The first letter is from Ercole d'Este to his brother Borso, and was sent from Foggia on 7 December 1456: "The *contado* of Molise [...], Casalduni [...], and many other towns have collapsed in ruins, killing all their inhabitants".

Il contado de Molixe [...], Casetune [...], e molte altre terre sono submerse cum tuta zente.

The report is attached to the letter of 22 December 1456 sent from Naples by the Milanese ambassador Antonio da Trezzo to duke Francesco Sforza: "Casalduni has been completely destroyed, and the lord of the town has been killed, together with his wife and four children".

Casaltone spianato in tutto et morto lo signore dela dicta terra cum la moglie et quattro figlioli.

The second letter was sent from Naples on 14 January 1457 by Pier Candido Decembrio to Cicco Simonetta, secretary to the duke of Milan: "Casaltone has similarly been reduced to ruins, and the local lord has been killed, together with his wife and children".

Casaltone similmente spianato e morto el signore de la terra con la moglie e fioli.

A document dated 14 February 1457, and partially transcribed in Figliuolo 1988-89 (the original is in the Archivio di Stato in Naples, *Significatorie dei Relevi*, I, 1456-67,

fol.38), records that Maria Caracciolo, sister of the late Giovanni Lupo Caracciolo, took his place as feudatory of *Castrum Casaltoni*, which she claims "has been completely reduced to ruins in the earthquake" (*fuisse propter terraemotum totaliter ruynatum*). According to Manetti: "Casaltino has been completely destroyed, and the local lord and all his family have been killed, together with seventy others".

Casaltinum, penitus pessundatum, dominum suum universamque eius familiam, simul cum septuaginta aliis interfecit.

Earthquake effects at Casalduni are also recorded in the French chronicle of Jean Chartier and the *Cronaca di Viterbo* of Nicola della Tuccia.

Cercemaggiore (province of Campobasso)

A large proportion of its houses collapsed, and 40 people were killed. The sources are a report dating to January 1457 and the chronicle of Pierozzi. The report of unknown authorship, probably dates to January 1457, was sent to cardinal Prospero Colonna: Cercemaggiore (*Cerchia maggiore*) is included in a list of places which suffered damage, but the author does not specify the extent of the damage. According to the chronicle of Pierozzi: "Cercemaggiore and another place called Spina both collapsed. In the former there were 40 victims, and in the latter 46".

Cherchum et alia dicta Spina pariter corruerunt, et in prima XL, in secunda XLVI, in pace quieverunt.

Cercepiccola (province of Campobasso)

A large proportion of its houses collapsed. Cercepiccola was a village of 75 hearths (estimated population: 375), and there were 90 victims (24%). The sources are a report dating to January 1457, Manetti's treatise, the contemporary chronicles of Pierozzi and Jean Chartier, and Astesano's poem. The report of unknown authorship, probably dates to January 1457, was sent to cardinal Prospero Colonna: Cercepiccola (*Cerchia piccola*) is included in a list of places which suffered damage, but the author does not specify the extent of the damage. According to Manetti: "Cercepiccola completely collapsed, killing ninety people".

Cierza cognomine Parvula, totam ad terram conversa, nonaginta homines extinxit.

According to the chronicle of Pierozzi: "Limosano was completely destroyed, and 35 people lost their lives in the ruins. Cercepiccola was struck by a similar disaster, and lost 88 people".

In Limosanu, diruta in totum, ruina XXXV absumpsit. Chercapiciu simili attrita flagello LXXXVIII caruit hominibus.

Ferrazzano (province of Campobasso)

A large proportion of its houses collapsed. Ferrazzano was a town of 139 hearths (estimated population: 695), and there were 60 victims (8.6%). The source is the *Cronaca di Viterbo* of Nicola della Tuccia: "The places listed below were all razed to the ground. [...] Ferrazzano had 60 victims. All these places were completely destroyed".

Queste terre sottoscritte furno tutte spianate. [...] Ferrazzano [morti] 60 [...] Tutte le dette terre cascorno del tutto.

Frigento (province of Avellino)

A large proportion of its houses collapsed. Frigento was a village of 42 hearths (estimated population: 210), and there were 50 victims (23.8%). The source is Manetti's treatise: "Freneto was found to have been half destroyed, and more than fifty people died there".

Frenetum, non sine plurium quam quinquaginta circiter mortalium iactura, semirutum quorumcumque aspicientium oculis pro palam videtur.

Frosolone (province of Isernia)

Almost all its houses collapsed. Frosolone was a town of 151 hearths (estimated population: 755), and there were 350 victims (46.3%). The sources are two reports and a letter dated December 1456 and January 1457, Manetti's treatise, a contemporary chronicle and Astesano's poem. The first report is attached to the letter of 22 December 1456 sent from Naples by the Milanese ambassador Antonio da Trezzo to duke Francesco Sforza: "Frosolone, under the lordship of Giacomo da Montagano, has been razed to the ground, and more than 100 people have been killed".

Frosolone del signore Giacomo de Montagano spianato et morti homini 100 et più.

The letter was sent from Naples on 14 January 1457 by Pier Candido Decembrio to Cicco Simonetta, secretary to the duke of Milan: "Frosolone, where Jacobo da Montagano is lord, has been reduced to ruins, and a great number of people have been killed: some say about a thousand and others three hundred".

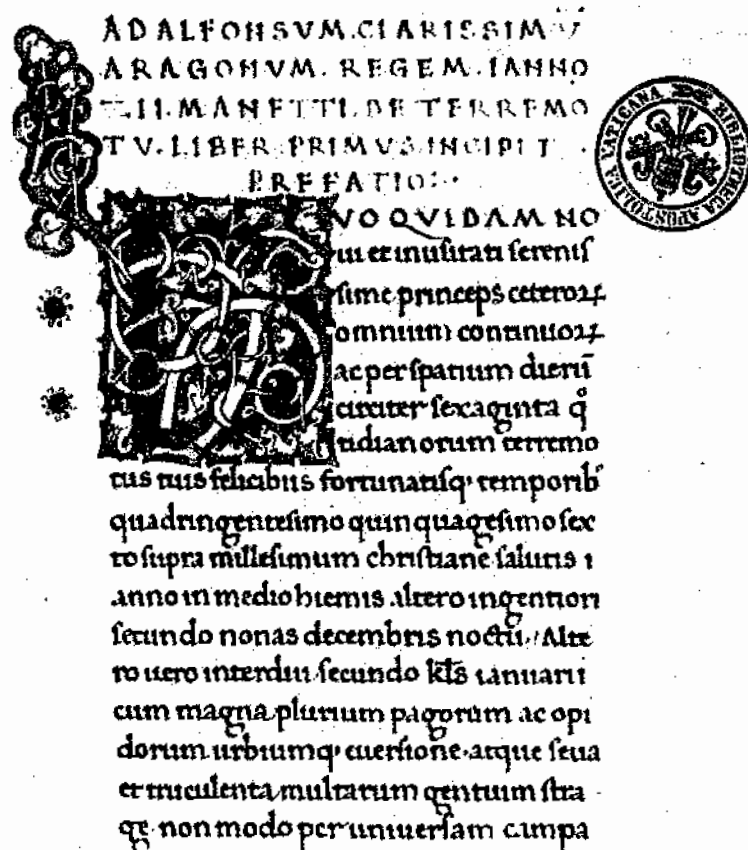


fig. 122 Title-page of the treatise *De terraemotu libri tres* by the Florentine humanist Giannozzo Manetti (1396-1459), who was counsellor at the court of Naples. This text is the most important source for the analysis of the December 1456 earthquake. The first book contains theoretical considerations on the causes of the earthquakes, the second a list of historical earthquakes; the third book is devoted entirely to the effects of the 1456 earthquake, probably on the basis of reports from the various governors. The Biblioteca Apostolica Vaticana has four codices of this exceptional work, which still lacks a critical edition. We have used the codex *Palatino Latino* 1077 (130 fols.).

Frosselone del signore Jacobo da Montegano spianato e morte infinite persone, chi dice circa mille, chi dice trecento.

The second report of unknown authorship, probably dates to January 1457, was sent to cardinal Prospero Colonna: Frosolone (*li casali de Frusolone*) is included in a list of places which suffered damage, but the author does not specify the extent of the damage. According to Manetti: "Frosolone [...] completely collapsed, killing about three hundred and fifty people".

Frosolonium [...] personas circiter trecentas et quinquaginta funditus corruens extinxit.

According to the chronicle of Pierozzi: "Frosolone was largely destroyed, and there were 317 victims".

Floscolone in magna parte conquassata, CCCXVII obierunt.

Limata (province of Benevento)

A large proportion of its houses collapsed, and there were many victims. The sources are two reports and a letter dating to December 1456 and January 1457.

The first report is attached to the letter of 22 December 1456 sent from Naples by the Milanese ambassador Antonio da Trezzo to duke Francesco Sforza: "Limata lies in ruins and almost all those who lived there have been killed".

Lunata è tutta in terra et morti quasi quanti gli ne habitavano.

The letter was sent from Naples on 14 January 1457 by Pier Candido Decembrio to Cicco Simonetta, secretary to the duke of Milan: "Limata is entirely in ruins and everybody has been killed".

Limata caduta interamente e spaciata tute le persone.

The second report of unknown authorship, probably dates to January 1457, was sent to cardinal Prospero Colonna: "Alife [...] Limata [...] Biccari, some of these have been destroyed, and others largely reduced to ruins".

Aliphe [...] Limata [...] Biccari, chi in abisso e chi ruinato in gran parte.

Macchiagodena (province of Isernia)

Almost all its houses collapsed. Macchiagodena was a village of 170 hearths (estimated population: 850), and there were 400 victims (47%). The sources are two reports and a letter dating to December 1456 and January 1457, a document dated 9 March 1457, Manetti's treatise, and the contemporary chronicles of Pierozzi and Nicola della Tuccia. The first report is attached to the letter of 22 December 1456 sent from Naples by the Milanese ambassador Antonio da Trezzo to duke Francesco Sforza: "Macchiagodena has been razed to the ground and almost all as above all those who lived there have been killed".

Machiodena spianata et quasi morti ut supra [tutti li habitanti].

The letter was sent from Naples on 14 January 1457 by Pier Candido Decembrio to Cicco Simonetta, secretary to the duke of Milan: "Macchiagodena is entirely in ruins and almost all the inhabitants have been killed".

Magiodena tuta spianata e morti quasi tuti li habitanti.

The second report of unknown authorship, probably dates to January 1457, was sent to cardinal Prospero Colonna: Macchiagodena (*Marchia Vodana*) is included in a list of place which suffered damage, but the author does not specify the extent of the damage. A document dated 9 March 1457 and partially transcribed in Figliuolo 1988-89 (the original is in the Archivio di Stato in Naples, *Significatorie dei Relevi*, I, 1456-67, fol.47)

states: "The town of Bojano is said to have been completely reduced to ruins in the earthquake; the castle of Macchiagodena was similarly affected by the earthquake".

Civitas Boiani quod asseritur fuisse propter terremotum totaliter ruynatum; castrum Machiagodanj, similiter ruynatum propter terremotum.

According to Manetti: "Macchiagodena was completely reduced to ruins, and about four hundred people were crushed to death".

Macagodena, a fundamentis penitus collapsa, quadrigentos circiter homines oppressit.

According to the chronicle of Pierozzi: "Macchiagodena was razed to the ground and 350 people perished there".

Macragodona funditus eversa CCCL perierunt.

Mirabella Eclano (province of Avellino)

A large proportion of its houses collapsed. Mirabella was a village of 96 hearths (estimated population: 480), and there were 200 victims (41.6%). The sources are Manetti's treatise and the chronicle of Pierozzi. According to Manetti: "Mirabella [Eclano] collapsed in ruins, killing two hundred people".

Mirabila, ad solum eversa, ducenta humana capita interemit.

According to the chronicle of Pierozzi: "Mirabella suffered the same disaster [it was razed to the ground] and 184 people lost their lives".

Mirabella idem [ad solum usque deducta] excidium passa est, vitam ibi amictentibus CLXXXIV.

Monteleone (province of Benevento)

Almost all its houses collapsed, and there were 617 victims. The source is the *Cronaca di Viterbo* of Nicola della Tuccia: "All the towns mentioned below were razed to the ground. [...] Monteleone de' Mileti had 617 victims".

Queste terre sottoscritte furno tutte spianate. [...] Monteleone de' Mileti [morti] 617.

Morcone (province of Benevento)

Most of its houses collapsed, and there were numerous victims. The sources are a letter and a report dating to December 1456 and January 1457, and Astosano's poem.

The letter is from Ercole d'Este to his brother Borso, and was sent from Foggia on 7 December 1456: "The *contado* of Molise, that is to say Campobasso [...] Morcone [...] and many other towns have collapsed in ruins, killing all their inhabitants".

Il contado de Molixe, cioè Campobasso [...] Mercono [...] e molte altre terre sono submerse cum tuta zente.

The report of unknown authorship, probably dates to January 1457, was sent to cardinal Prospero Colonna: "Alife [...], Morcone and its *contado* [...], Biccari, have either been totally or largely destroyed".

Aliphe [...], Morcone con lo contado [...], Biccari, chi in abisso e chi ruinato in gran parte.

Roccasicura (province of Isernia)

Much of it collapsed. Roccasicura was a village of 11 hearths (estimated population: 55), and there were 12 victims (21.8%). The sources are Manetti's treatise and the chronicle of Pierozzi. According to Manetti: "Roccasicura, commonly called Cicuta, was razed to the ground, and twelve people were killed".

Troccia vulgato nomine Cicuta, humi prostrata, duodecim personas occidit.

According to the chronicle of Pierozzi, Roccasicura (*Rochacichuta*) was one of the places which "were completely devastated in these earthquakes. In some places there were victims, though perhaps not many, and in the case of others, I have not seen any number mentioned".

in totum desolate sunt ex dictis terremotibus. Et in aliquibus earum mortui sunt aliqui licet pauci, de aliis non vidi numerum designatum.

San Giorgio la Molara (province of Benevento)

A large proportion of its houses collapsed. The source is a report of unknown authorship, probably dating to January 1457, and sent to cardinal Prospero Colonna: "San Marco and San Giorgio, in the *contado* of Fondi, are largely in ruins".

S.Marco e S.Giorgio nel contado di Fondi, ruinati in gran parte.

San Giuliano del Sannio (province of Campobasso)

Almost all its houses collapsed. San Giuliano was a village of 112 hearths (estimated population: 560), and there were 215 victims (38.3%). The sources are a letter and a report dating to December 1456 and January 1457, Manetti's treatise, three contemporary chronicles and Astesano's poem. The letter is from Ercole d'Este to his brother Borso, and was sent from Foggia on 7 December 1456: "The *contado* of Molise, that is to say Campobasso [...] San Giuliano, [...] and many other towns have been reduced to ruins, and all their inhabitants killed".

Il contado de Molixe, cioè Campobasso, [...] San Ziliano, [...] e molte altre terre sono submerse cum tuta zente.

The report of unknown authorship, probably dates to January 1457, was sent to cardinal Prospero Colonna: San Giuliano del Sannio (*San Giuliano*) is included in a list of places which suffered damage, but the author does not specify the extent of the damage. According to Manetti: "San Giuliano was razed to the ground and mourns two hundred and fifteen people".

Castrum titulo Sancti Iuliani, ad terram usque collapsum, quindecim supra ducentas personas desideravit.

According to the chronicle of Pierozzi: "The castle of San Giuliano was completely destroyed, and 211 people returned to their fathers".

In castro sancti Iuliani funditus everso appositi sunt ad patres suos CCXI.

Earthquake effects at San Giuliano are also recorded in the French chronicle of Jean Chartier and the *Cronaca di Viterbo* of Nicola della Tuccia.

San Marco dei Cavoti (province of Benevento)

A large proportion of its houses collapsed. The source is a report of unknown authorship, probably dating to January 1457, and sent to cardinal Prospero Colonna: "San Marco and San Giorgio, in the *contado* of Fondi, are largely in ruins".

S.Marco e S.Giorgio nel contado di Fondi, ruinati in gran parte.

San Polomatese (province of Campobasso)

Almost all its houses collapsed, and there were many victims.

The source is the *Cronaca di Viterbo* of Nicola della Tuccia: "All the towns mentioned below were razed to the ground [...] at San Paolo [San Polomatese] there were a great many victims".

Queste terre sottoscritte furno tutte spianate [...] San Paolo morti assai.

Sant'Angelo in Grotte (province of Isernia)

A large proportion of its houses collapsed. The sources are a report dating to January 1457 and the chronicle of Pierozzi. The report of unknown authorship, probably dates to January 1457, was sent to cardinal Prospero Colonna: Sant'Angelo in Grotte (*Santo Angelo in Grotta*) is included in a list of places which suffered damage, but the author does not specify the extent of the damage.

According to the chronicle of Pierozzi, Sant'Angelo in Grotte (*sancti Angeli in Grattula*) was one of the places which "were completely devastated in these earthquakes. In some places there were victims, though perhaps not many, and in the case of others, I have not seen any number mentioned".

in totum desolate sunt ex dictis terremotibus. Et in aliquibus earum mortui sunt aliqui licet pauci, de aliis non vidi numerum designatum.

Santo Stefano (province of Campobasso)

Almost all its houses collapsed. Santo Stefano was a village of 15 hearths (estimated population: 75), and there were 35 victims (46.6%). The sources are Manetti's treatise and the chronicle of Pierozzi. According to Manetti: "Santo Stefano completely collapsed, and mourned the death of thirty-five people".

Castrum titulo Sancti Stephani, penitus collapsum, triginta quinque personas desideravit.

According to the chronicle of Pierozzi, Santo Stefano (*sancti Stephani*) was one of the places which "were completely devastated in these earthquakes. In some places there were victims, though perhaps not many, and in the case of others, I have not seen any number mentioned".

in totum desolate sunt ex dictis terremotibus. Et in aliquibus earum mortui sunt aliqui licet pauci, de aliis non vidi numerum designatum.

Tocco da Casauria (province of Pescara)

Most of its houses collapsed, as well as the castle. Tocco was a town of 227 hearths (estimated population: 1,135), and there were 300 victims (26.4%). The sources are three letters and two reports dating to December 1456 and January 1457, Manetti's treatise, eight contemporary chronicles, an inscription and Astesano's poem. The first letter was sent from Foggia on 12 December 1456, and was written by the Mantuan ambassador, to marquis Luigi III Gonzaga: "Tocco is partly in ruins and a great many people have been killed, and the castle has collapsed, killing the lord Giovanni Torto and his sons and daughters, with the exception of his eldest son and his children, and a married daughter".

Tocho et ruinato in parte con molto interrito de huomini assai, e lo castello è caduto, dove è morto Ioanne Torto signor con figlioli e figliole, excepto el primogenito con li figlioli e una figliola maritata.

The first report is attached to the letter of 22 December 1456 sent from Naples by the Milanese ambassador Antonio da Trezzo to duke Francesco Sforza: "At Tocco the lord has been killed, and many others".

Tohe è morto il signore et molti altri.

The second letter was sent from Naples on 14 January 1457 by Pier Candido Decembrio to Cicco Simonetta, secretary to the duke of Milan: "At Tocco the local lord has been killed, along with nearly all the inhabitants".

A Tocho è morto el signore e quasi tuti li abitanti.

The third letter probably dates to January 1457, but the sender and recipient are unknown: "The town of Tocco is entirely in ruins".

La città di Tharthe tutta rotta.

The second report of unknown authorship, probably dates to January 1457, was sent to cardinal Prospero Colonna: "Tocco is entirely in ruins, and 299 people have been killed".

Tocho è tuto rovinato e morte persone dusento novanta nove.

According to Manetti: "Tocco [da Casauria] (it is uncertain whether this is a new or ancient town) is completely reduced to ruins, and the lord of the place met a cruel death with all his family, as well as three hundred other people".

Tuchium utrum novum vel vetustum incertum est: penitus laceratum dominum suum et totam eius familiam simul cum trecentis hominibus crudeliter interemit.

According to the chronicle of Pierozzi: "Tocco has been completely destroyed, and its lord has been crushed to death with his family and 350 others".

In Tochu tota diruta oppressi sunt dominus eius cum familia et aliis numero CCCI.

There is an inscription in the courtyard of the *palazzo ducale* at Tocco da Casauria which records the death of the local lord. The interpretation of its text is somewhat debated. It has been reconstructed by Magri and Molin (1984, fig.3, unnumbered page between 6 and 7, and p.158) and rather differently by Figliuolo (1988-89, II, p.152). Earthquake effects at Tocco are also recorded in the following chronicles: the *Annales de Raimo*, the L'Aquila chronicles of Francesco D'Angeluccio and Alessandro de Ritiis, the French chronicle of Jean Chartier.

Vinchiaturò (province of Campobasso)

Almost all its houses collapsed. Vinchiaturò was a village of 58 hearths (estimated population: 290), and there were 130 victims (44.8%). The sources are a report dating to January 1457, Manetti's treatise and a contemporary chronicle. The report of unknown authorship, probably dates to January 1457, was sent to cardinal Prospero Colonna: Vinchiaturò (*Vinchianturo*) is included in a list of places which suffered damage, but the author does not specify the extent of the damage.

According to Manetti: "Vinchiaturò was razed to the ground, and about one hundred and thirty people were killed".

Vinciatorium, omne a fundamentis devastatum, triginta et centum circiter personas sua eversione occidit.

According to the chronicle of Pierozzi: "Vinchiaturò was reduced to ruins like the other places [Toro, Mirabella, etc.] and lost 120 people".

Vinclatorium in ruina non discrepans a predictis CXX hominibus privata est.

Grottaminarda (province of Avellino)

A large proportion of its houses collapsed. The source is a report of unknown authorship, probably dates to January 1457, sent to cardinal Prospero Colonna: "Alife [...], Grottaminarda [...] Biccari, some of these have been destroyed, and others largely reduced to ruins".

Aliphe [...], Grotta manardata [...] Biccari, chi in abisso e chi ruinato in gran parte.

Tocco Caudio (province of Benevento)

A large proportion of its houses collapsed, and most of its inhabitants were killed. The sources are the chronicle of Pierozzi and a *Notula* in the margin of a codex of prayers

for solemn days for the Jewish community in Rome (Jewish and National Library of Jerusalem, *Heb. Ms.*, 38*, 4281, fol.389v.). Earthquake effects at Tocco are also recorded in the chronicles of Nicola della Tuccia, and Giovanni di mastro Pedrino of Forlì. According to the chronicle of Pierozzi: "The town called Tocco in the Varventana valley was razed to the ground, but I have not heard how many victims there were".

[urbs] que dicitur Tochu in valle Varventana, ad solum usque deducta; defunctorum numerum descriptum non recepi.

The *Notula* in the margin of the book of prayers records: "Great are the works of the Lord studied by all who have pleasure in them' (*Psalms* 111, 2). These are the secrets, let us tell. A great quake occurred in the year [5],217 [=1456] of God, who is my light and my salvation, as we were lying in bed at nearly the eleventh hour of the night, on the eighth day of *Tevet* [5 December] and the earth shook in this province, here in the city of Tocco and many of the city's houses collapsed and it spread to all the country of Apulia up to Naples and it also reached Calabria and they say that about sixty thousand souls died, and some towns in Apulia were overthrown like Sodom and Gomorrah, and praise be to Him who works wonders, may He bring forth our redemption and save us, [may He bring] eternal salvation. Amen".

גדולים מעשה יי דרושים לכל הפציהם [תהלים קיא, ב]. זה רזינו ונספרה. רעש גדול היה שנת ר"ז [5217] שנת ה' אורח וישעי [תהלים כז, א] בהיותנו שוכבין] במטה סמוך לאחת עשרה שעות בלילה בשמנה ימי' לחדש טבת רעשה הארץ בגלילינו זה בכרך טוקו ונפלו רב בתי העיר ועבר בכל ארץ פוליא עד נפולי ועבר גם בגליל קלבריא ואומ' כי מתו כשישים אלף נפשות כי היו בפוליא עיירות נתהפכו כהפיכת סדום ועמורה וברוך המפליא לעזור וה' למענ[ו] יקרב קץ גאולתנו וישיענו תשועה עולמים. אמן.

Alife (province of Caserta)

A large proportion of its houses collapsed. Alife was a town of 190 hearths (estimated population: 950), and there were 60 victims (6.3%). The sources are two letters and two reports dating to December 1456 and January 1457, Manetti's treatise and four contemporary chronicles. The first letter was sent from Foggia on 12 December 1456, and was written by the Mantuan ambassador, to marquis Luigi III Gonzaga: "The territories of Prince Trayano include Alife, which is said to have been completely destroyed".

De verso le terre del principe Trayano, como è Aliphi, che se dice esser in tutto ruinato.

The first report is attached to the letter of 22 December 1456 sent from Naples by the Milanese ambassador Antonio da Trezzo to duke Francesco Sforza: "Alife and its castle are in that territory, and about 400 people have lost their lives there".

Liffi è in terra et lo castello et mancate persone circa 400.

The second letter was sent from Naples on 14 January 1457 by Pier Candido Decembrio to Cicco Simonetta, secretary to the duke of Milan: "Alife and the castle are entirely in ruins, and about 400 people have been killed".

Lifi tuto è spianato e lo castello, morte persone circa CCCC0 [400].

The second report of unknown authorship, probably dates to January 1457, was sent to cardinal Prospero Colonna: "Aliphe, [...], Biccari, have been either totally or largely destroyed".

Aliphe, [...], Biccari, chi in abisso e chi ruinato in gran parte.

In Manetti's treatise, the number of victims is much lower than in Antonio da Trezzo's report: "Alifio, called Alife in olden times, was once a fairly important town. Now most of it has collapsed, and it mourns sixty victims".

Alifium vel Alife, antiquitus vetustum et olim non ignobile opidum, pro maiori portione sua obrutum, sexaginta mortales desideratos recensuit.

The number of victims recorded by Pierozzi is the same as that in Manetti: "Most of Alife has been destroyed, and 60 victims have been found in the ruins".

Alisi pro magna parte destructa LX sub ruinis invenit.

The most detailed of the other chronicles is that of Giovanni di mastro Pedrino of Forlì. The *Annales Forolivienses* and the annals of Lorenzo Bonincontri record the earthquake in more general terms.

Aquilonia Vecchia [formerly Carbonara] (province of Avellino)

A large proportion of its buildings collapsed. Carbonara was a village of 42 hearths (estimated population: 205), and there were 30 victims (14.6%).

The source is Manetti's treatise: "Carbonaria [Aquilonia] was razed to the ground, and about thirty people were buried in the ruins".

Carbonarium humi prostratum triginta circiter hominum capita contrivit.

Avellino

Some buildings collapsed, while others were spared. This probably means that effects varied within the urban area. Avellino was a town of 100 hearths (estimated population: 500), and there were 15 victims (3%). The sources are a letter of 8 December 1456, Manetti's treatise and Pierozzi's chronicle. The letter sent from Naples on 8 December 1456 was written by the Florentine merchant Paolo Rucellai to his brother Giovanni: "Avellino has been flattened — no-one ever saw such a thing".

Avellino spianato, che mai si vide simile cosa.

According to Manetti: "At Avellino, an ancient town [...] part has been destroyed and part remains intact, and fifteen people have been crushed to death".

Avellinum vetustum opidum [...] partim vastatum, partim vero conservatum, quindecim homines oppressit.

In Pierozzi's chronicle, Avellino is included amongst places which "suffered considerable damage in the earthquakes [...] Of the villages listed which did not suffer serious damage, we do not have the number of victims".

notabile detrimentum receperunt ex ipsis terremotibus. [...] non tantam ruinam passe sunt, numerus defunctorum non habetur descriptus.

Baranello (province of Campobasso)

A large proportion of its houses collapsed. Baranello was a village of 62 hearths (estimated population: 310), and there were 20 victims (6.4%). The sources are a report dating to January 1457, Manetti's treatise and the chronicle of Pierozzi.

The report of unknown authorship, probably dates to January 1457, was sent to cardinal Prospero Colonna: Baranello is included in a list of places which suffered damage, but the author does not specify the extent of the damage. According to Manetti: "Baranello was completely reduced to ruins, and about twenty people were killed in the collapse".

Varanellum, totum humi prostratum, viginti circiter personas sua ruina extinxit.

According to Pierozzi, Baranello (*Varanella*) was one of the places which "were completely devastated in these earthquakes. In some places there were victims, though perhaps not many, and in the case of others, I have not seen any number mentioned".

in totum desolate sunt ex dictis terremotibus. Et in aliquibus earum mortui sunt aliqui licet pauci, de aliis non vidi numerum designatum.

Busso (province Campobasso)

A large proportion of its houses collapsed. Busso was a village of 43 hearths (estimated population: 215), and there were 40 victims (18.6%). The sources are a report dating to January 1457, Manetti's treatise and the chronicle of Pierozzi. The report of unknown authorship, probably dates to January 1457, was sent to cardinal Prospero Colonna: Busso (*lo Bosso*) is included in a list of places which suffered damage, but the author does not specify the extent of the damage. According to Manetti: "Busso was completely reduced to ruins, and mourned the death of forty people".

Bussium, totum devastatum, quadriginta personas desiderasse deprehenditur.

According to the chronicle of Pierozzi, Busso (*Bussu*) was one of the places which "suffered appreciable harm in these earthquakes [...] they were not very badly damaged, and we are not told the number of victims".

notabile detrimentum receperunt ex ipsis terraemotibus [...] non tantam ruinam passe sunt, numerus defunctorum non habetur descriptus.

Campobasso

A large proportion of its houses collapsed, as well as the fortress. Campobasso was a town of 274 hearths (estimated population: 1,370), and there were 70 victims (5.1%). The sources are three letters dating to December 1456, Manetti's treatise, a contemporary chronicle and Astesano's poem.

The first letter is from Ercole d'Este to his brother Borso, and was sent from Foggia on 7 December 1456: "The *contado* of Molise [...] Campobasso [...] and many other towns have been reduced to ruins, and all their inhabitants killed".

Il contado de Molixe [...] Campobasso [...] e molte altre terre sono submerse cum tuta zente.

The second letter was sent from Foggia on 12 December 1456, and was written by the Mantuan ambassador, to marquis Luigi III Gonzaga: "Most of Campobasso is in ruins and many people have been killed there, and the same fate has befallen many other places belonging to that lord".

Campobasso è ruinato per la maggior parte, con occisione de molti huomini, et così molti altri luogi de quello signor.

The third letter probably dates to January 1457, but the sender and recipient are unknown: "Much of the villages of Capitanata and Campobasso has been destroyed".

Nei paesi di Capitanata e di Campobasso, la massima parte guasti.

According to Manetti: "Campobasso [...] found that its fortress was in ruins and three hundred houses had collapsed, and more than seventy people were dead".

Campobassus [...] arcem suam obrutam et trecentas domos collapsas ultra septuaginta homines defunctos conspexit.

Earthquake effects at Campobasso are recorded in the French chronicle of Jean Chartier.

Campochiaro (province of Campobasso)

Almost all its houses collapsed. Campochiaro was a village of 94 hearths (estimated population: 470), and there were 20 victims (4.2%). The sources are two reports and a letter dated December 1456 and January 1457, Manetti's treatise, the contemporary chronicles of Pierozzi and Nicola della Tuccia, and Astesano's poem. The first report is attached to the letter of 22 December 1456 sent from Naples by the Milanese ambassador Antonio da Trezzo to duke Francesco Sforza: "Colla da San Fremondo was killed at Campochiaro, together with his wife and children, and about 200 other people".

Campochiaro morto Colla de San Framondo con la moglie et li figlioli et persone circa 200.

The letter was sent from Naples on 14 January 1457 by Pier Candido Decembrio to Cicco Simonetta, secretary to the duke of Milan: "Campo Chiaro is in ruins, and Colla da San Framondo has been killed with his wife and children and about 200 inhabitants".

Campo Chiaro desfato e morto Colla da San Framondo con la moglie e figli e li habitanti circa el numero CC [200].

The second report of unknown authorship, probably dates to January 1457, was sent to cardinal Prospero Colonna: "Campochiaro is completely in ruins, and the local lord Alvise Sanframondo and all his children have been killed there".

Campochiaro disfato in tuto, dove è morto il signor Alvise Sanframondo con tutta la so generacion.

According to Manetti: "Campochiaro collapsed in ruins, killing twenty people".

Campoclarium, ad solum eversum, viginti mortales extinxit.

According to the chronicle of Pierozzi, Campochiaro (*Campocarū*) was one of the places which "suffered appreciable harm in these earthquakes [...] they were not very badly damaged, and we are not told the number of victims there".

notabile detrimentum receperunt ex ipsis terraemotibus [...] non tantam ruinam passe sunt, numerus defunctorum non habetur descriptus.

Canosa di Puglia (province of Bari)

A large proportion of its houses collapsed. Canosa was a town of 135 hearths (estimated population: 675), and there were 30 victims (4.4%). The sources are a letter dated 7 December 1456, Manetti's treatise, the contemporary chronicles of Pierozzi and Jean Chartier and Astesano's poem. The letter is from Ercole d'Este to his brother Borso, and was sent from Foggia on 7 December 1456: "At Canosa, the castle and part of the town lie in ruins".

Canossa lo castello e parte dela terra per terra.

According to Manetti: "The citadel of Cannae, or Cannusio [Canosa], which is important for the extraordinary and famous slaughter of the Romans, completely collapsed, involving the tragic death of about thirty people".

Cannarum castrum sive Cannusium admirabili illa et celebrata romanorum strage nobilitatum non sine circiter triginta mortuorum hominum iactura penitus corruit.

According to the chronicle of Pierozzi: "The castle of Canosa was as strong as any other in this land [of Apulia] in the said kingdom, but it was completely reduced to ruins".

Castellum Canose fortissimum sicut quodcumque aliud in terra dicti regni, totum comminutum.

Cantalupo nel Sannio (province of Isernia)

A large proportion of its buildings collapsed. Cantalupo was a village of 88 hearths (estimated population: 440), and there were 30 victims (6.8%). The source is Manetti's treatise: "Most of Cantalupo was laid waste, and about thirty people met their death".

Cantalupium, plerumque vastatum, triginta circiter homines delevit.

Carpinone (province of Isernia)

A large proportion of its houses collapsed. Carpinone was a village of 88 hearths (estimated population: 440), and there were 50 victims (11.3%). The sources are two reports and a letter dating to December 1456 and January 1457, Manetti's treatise, the chronicle of Pierozzi and Astesano's poem. The first report is attached to the let-

ter of 22 December 1456 sent from Naples by the Milanese ambassador Antonio da Trezzo to duke Francesco Sforza: "Carpinone is in ruins and about one hundred people have been killed".

Carpenone guasto et morte circha persone 100.

The letter was sent from Naples on 14 January 1457 by Pier Candido Decembrio to Cicco Simonetta, secretary to the duke of Milan: "Carpinone is all in ruins, and they say that about 200 people have been killed".

Carpenone tuto disfato, morte persone come dicono circa CC [200].

The second report of unknown authorship, probably dates to January 1457, was sent to cardinal Prospero Colonna: Carpinone is included in a list of places which suffered damage, but the author does not specify the extent of the damage. According to Manetti: "Carpinone was completely reduced to ruins, and fifty people were killed there".

Carpinonium penitus devastatum quinquaginta personarum capita contrivit.

According to the chronicle of Pierozzi, Carpinone was one of the places which "were completely devastated in these earthquakes. In some places there were victims, though perhaps not many, and in the case of others, I have not seen any number mentioned".

in totum desolate sunt ex dictis terremotibus. Et in aliquibus earum mortui sunt aliqui licet pauci, de aliis non vidi numerum designatum.

Casacalenda (province of Campobasso)

A large proportion of its houses collapsed. Casacalenda was a village of 96 hearths (estimated population: 480), and there were 60 victims (12.5%). The sources are Manetti's treatise and the chronicle of Pierozzi. According to Manetti: "Casacalenda completely collapsed, and sixty people were crushed to death in the ruins".

Calendium opidum quoddam, penitus humi prostatum, sexaginta personas illa ruina oppressit.

According to the chronicle of Pierozzi, Casacalenda (*Casale Calenda*) was one of the places which "suffered appreciable harm in these earthquakes [...] they were not very badly damaged, and we are not told the number of victims".

notabile detrimentum receperunt ex ipsis terraemotibus [...] non tantam ruinam passe sunt, numerus defunctorum non habetur descriptus.

Castelcicala (province of Naples)

There was some damage, but its exact extent is not known. The source is a report of unknown authorship, probably dating to January 1457, and sent to cardinal Prospero Colonna: Castelcicala (*castel de Nola detto Cicala*) is included in a list of places struck by the earthquake, but for which the writer does not specify the effects.

Castel di Sangro (province of L'Aquila)

A large proportion of its buildings collapsed. Castel di Sangro was a town of 192 hearths (estimated population: 960), and there were 70 victims (7.2%). The sources are two letters and a report dating to December 1456 and January 1457, a privilege dated 30 March 1457, Manetti's treatise, six contemporary chronicles and Astesano's poem. The first letter was sent from Foggia on 12 December 1456, and was written by the Mantuan ambassador, to marquis Luigi III Gonzaga: "They say that Castel di Sangro is completely in ruins and that almost all the inhabitants have perished".

lo Castello de Sarignane dice al tutto esser ruinato, e quasi tutti li huomini esser periti.

The second letter probably dates to January 1457, but the sender and recipient are unknown: "Most of Castel di Sangro has collapsed in ruins".

Il castel di Sangro nella massima parte rotto e guasto.

The report of unknown authorship, probably dates to January 1457, was sent to cardinal Colonna: "Castel di Sangro is entirely destroyed and in ruins, except for seven houses".

Castel de Sanguine è tuto ruinato e disfato ecetto 7 case.

In a privilege dated 30 March 1457, Berardo Gasparo d'Aquino, marquis of Pescara, grants 20 ducats for four years to the town of Castel di Sangro (in Balzano 1915, p.12, no.7): "Berardo Gaspare d'Aquino, marquis of Pescara, in the year 1456 [1457], on 30 March, in the fifth indiction, on account of the deaths caused by the epidemic, as well as the destruction caused by the earthquake in the said year, renounced and released to the said community 20 ducats for four years out of the 72 ducats due annually for the Virgin Mary collection in August: as appears from the privilege written on parchment".

Berardus Gaspar de Aquino, Marchio Piscariae, in anno 1456 [=1457], die 30 Martii, quintae indictionis, ob mortalitatis morbum necnon propter magni terremoti ruinam anni predicti, renuntiavit et relassavit Universitati predictae ducatos viginti pro quatuor annis de annuis ducatis septuaginta duobus debitis pro collecta Sanctae Mariae de mense Augusti: ut apparet ex privilegio in bergameno scripto.

According to Manetti: "Sarno [in fact Castel di Sangro] takes its name from the river or mountain of that name, at the foot of which it stood. When the mountain, which overlooks the village, collapsed on to a large part of it, about seventy people were crushed to death".

Sarnum, vel à fluvio vel a monte eiusdem nonimis in cuius radicibus situm erat appellatum, ad ruinam predicti montis qui illi imminebat super magnam opidi partem collapsi, septuaginta circiter personas propria sue portionis obritione interemit.

According to the chronicle of Pierozzi: "At the castle of San Iuhino [Castel di Sangro], the hill which overlooks it collapsed on to it, burying it together with 44 of its inhabitants".

Castellum sancti Iuhini montaneta que ei imminebat ceditit super illud, cooperiens ipsum, et XLIV homines eius.

Earthquake effects at Castel di Sangro are also recorded in the following chronicles: the LAquila chronicles of Francesco D'Angeluccio and Alessandro de Ritiis, the French chronicle of Jean Chartier, the *Cronaca di Viterbo* of Nicola della Tuccia, and the Brescian chronicle of Corradino di Palazzo.

Castel San Vincenzo (province of Isernia)

A large proportion of its houses collapsed. Castel San Vincenzo was a village of 30 hearths (estimated population: 150), and there were 20 victims (13.3%). The sources are Manetti's treatise and the chronicle of Pierozzi. According to Manetti: "Castel San Vincenzo collapsed in ruins, sending all its twenty inhabitants to their death".

Castellum titulo Sancti Vincentii, ad solum eversum, cunctos incolas numero viginti ad necem pessundedit.

According to Pierozzi, Castel San Vincenzo (*castellum sanctii Vincentii*) was one of the places which "were completely devastated in these earthquakes. In some places there were victims, though perhaps not many, and in the case of others I have not seen any number mentioned".

in totum desolate sunt ex dictis terremotibus. Et in aliquibus earum mortui sunt aliqui licet pauci, de aliis non vidi numerum designatum.

Castellino del Biferno (province of Campobasso)

A large proportion of its houses collapsed. Castellino was a village of 43 hearths (estimated population: 215), and there were 12 victims (5.5%). The source is Manetti's treatise: "At Castellino [del Biferno], twelve people were killed in its destruction".

Castillinium sua internitione duodecim mortales interemit.

Castellone al Volturmo (province of Isernia)

A large proportion of its houses collapsed. Castellone was a village of 30 hearths (estimated population: 150), and there were 20 victims (13.3%). The sources are Manetti's treatise, the chronicle of Pierozzi and Astesano's poem. According to Manetti: "Castellone [al Volturmo] was completely shaken and torn apart, and the same number [20] of people were killed".

Castrileonium totum conquassatum laceratumque totidem personas occidit.

According to Pierozzi, Castellone al Volturmo (*Castillonum*) was one of the places which "were completely devastated in these earthquakes. In some places there were victims, though perhaps not many, and in the case of others, I have not seen any number mentioned".

in totum desolate sunt ex dictis terremotibus. Et in aliquibus earum mortui sunt aliqui licet pauci, de aliis non vidi numerum designatum.

Castelmauro [formerly Castelluccio Acquaborrana] (province of Campobasso)

The fortress and some houses collapsed. Castelluccio Acquaborrana was a town of 170 hearths (estimated population: 850), and there were about 20 victims (2.3%). The sources are Manetti's treatise and Pierozzi's chronicle. According to Manetti: "At Castelluccio, the fortress collapsed and part of the village, killing about twenty people".

Castellucium arcem et partem opidi cum viginti circiter mortuorum hominum desiderio conspexit.

In Pierozzi's chronicle, Castelluccio (*Castelluco*) is included amongst places which "have been completely laid waste by these earthquakes. In some cases there were victims, though perhaps not many, and in others I have not seen any number mentioned".

in totum desolate sunt ex dictis terremotibus. Et in aliquibus earum mortui sunt aliqui licet pauci, de aliis non vidi numerum designatum.

Castelpetroso (province of Isernia)

Many houses collapsed, as well as the fortress. Castelpetroso was a village of 91 hearths (estimated population: 455), and there were 20 victims (4.4%). The sources are two reports and a letter dating to December 1456 and January 1457, Manetti's treatise and the French chronicle of Jean Chartier.

The first report is attached to the letter of 22 December 1456 sent from Naples by the Milanese ambassador Antonio da Trezzo to duke Francesco Sforza: "Castelpetroso has been razed to the ground, and about 500 people have perished".

Castello Petrusio spianato et mancate anime circha 500.

The letter was sent from Naples on 14 January 1457 by Pier Candido Decembrio to Cicco Simonetta, secretary to the duke of Milan: "Castelpetroso lies in ruins, and about 600 people have been killed".

Castello Petrusio spianato e morte circha persone VIC [600].

The second report of unknown authorship, probably dates to January 1457, was sent to cardinal Prospero Colonna: Castelpetroso (*Castelpretoso*) is included in a list of places

which suffered damage, but the author does not specify the extent of the damage. According to Manetti: "Castelpetroso suffered the collapse of its fortress and many houses, and twenty people were killed".

Castrum cognomento Petrosum, propriam arcem multasque domos humi prostatas, cum viginti defunctis recognovit.

Castiglione a Casauria (province of Pescara)

Its fortress collapsed, as well as a large proportion of its houses. Castiglione was a village of 74 hearths (estimated population: 370), and there were 20 victims (5.4%). The sources are Manetti's treatise and the contemporary chronicles of Pierozzi and Francesco d'Angeluccio. According to Manetti: "Another Castrileonio [Castiglione a Casauria], belonging to the duke of Sora [...] collapsed in ruins, and twenty people were killed".

Castrileonium alterum ducis Sorani [...] humi prostatum, viginti homines ad necem compulit.

According to Pierozzi, Castiglione a Casauria (*Castellina ducis [S]ore*) was one of the places which "were completely devastated in these earthquakes. In some places there were victims, though perhaps not many, and in the case of others, I have not seen any number mentioned".

in totum desolate sunt ex dictis terremotibus. Et in aliquibus earum mortui sunt aliqui licet pauci, de aliis non vidi numerum designatum.

Castropignano (province of Campobasso)

A large proportion of its houses collapsed. Castropignano was a town of 113 hearths (estimated population: 565), and there were 20 victims (3.5%). The sources are Manetti's treatise and the chronicle of Pierozzi. According to Manetti: "Castropignano was largely laid waste and destroyed, and suffered the death of about twenty people".

Pinianum Castrum, magna ex parte vastatum laceratumque, viginti circiter hominum capita contrivit.

According to the chronicle of Pierozzi, Castropignano (*Pignanu*) was one of the places which "suffered appreciable harm in these earthquakes [...] they were not very badly damaged, and we are not told the number of victims".

notabile detrimentum receperunt ex ipsis terremotibus [...] non tantam ruinam passe sunt, numerus defunctorum non habetur descriptus.

Cerreto Sannita (province of Benevento)

A large proportion of its houses collapsed. Cerreto was a town of 210 hearths (estimated population: 1,050), and there were 150 victims (14.2%). The sources are two reports and a letter dating to December 1456 and January 1457, Manetti's treatise and Astesano's poem. The first report is attached to the letter of 22 December 1456 sent from Naples by the Milanese ambassador Antonio da Trezzo to duke Francesco Sforza: "Cerreto is completely in ruins and about 300 people have been killed, which is to say nearly all its inhabitants".

Cerreto tutto in terra e manca circha persone 300, che pochi più gli n'erano.

The letter was sent from Naples on 14 January 1457 by Pier Candido Decembrio to Cicco Simonetta, secretary to the duke of Milan: "Cerreto, too, lies completely in ruins, and more than 300 people have been killed".

Zerato et etiamdio tuto in terra e morte dele persone più de CCCto [300].

The second report of unknown authorship, probably dates to January 1457, was sent

to cardinal Prospero Colonna: "Cerreto and its *contado* are completely in ruins".

Cereto con lo contado tuto in ruina.

According to Manetti: "Cerreto [Sannita] was almost completely destroyed, and one hundred and fifty people were killed there".

Cerretum, totum pene vastatum, centum quinquaginta personas occidit.

Cerro al Voltorno (province of Isernia)

A large proportion of its houses collapsed. Cerro was a village of 89 hearths (estimated population: 445), and there were 45 victims (10.1%). The source is Manetti's treatise: "Cerro [al Voltorno] completely collapsed, killing all its forty-five inhabitants".

Cerrium, penitus collapsum, omnes habitatores suos, numero quadriginta quinque, penitus interemit.

Colle d'Anchise (province of Campobasso)

A large proportion of its houses collapsed. Colle d'Anchise was a village of 34 hearths (estimated population: 170), and there were 20 victims (11.7%). The sources are a report dating to January 1457, Manetti's treatise, two contemporary chronicles and Astesano's poem. The report of unknown authorship, probably dates to January 1457, was sent to cardinal Prospero Colonna: Colle d'Anchise (*Cornachisi*) is included in a list of places which suffered damage, but the author does not specify the extent of the damage. According to Manetti: "Cornicasio [Colle d'Anchise] was completely destroyed and mourned the death of twenty people".

Cornicasium, totum desolatum, viginti homines desideravit.

According to the chronicle of Pierozzi, Colle d'Anchise (*Corimacoisi*) was one of the places which "suffered appreciable harm in the earthquakes [...] they were not very badly damaged, and we are not told the number of victims".

notabile detrimentum receperunt ex ipsis terremotibus [...] non tantam ruinam passe sunt, numerus defunctorum non habetur descriptus.

Corsano (province of Avellino)

There must have been some damage, since people were killed. Corsano was a village of 50 hearths (estimated population: 250), and there were 20 victims (8%). The source is Manetti's treatise: "Though Corsano suffered little damage, about twenty people were killed there".

Cursanum parva quedam, cum ruinarum tum personarum circiter viginti, detrimenta cognovit.

Covatta (province of Campobasso)

Most of its houses collapsed. Covatta was a village of 20 hearths (estimated population: 100), and there were 12 victims (12%). The sources are Manetti's treatise and the chronicle of Pierozzi. According to Manetti: "Quazia [Covatta] collapsed in ruins, burying about twelve of its inhabitants".

Quatia, ad solum eversa, duodecim circiter habitatores suos obrivit.

According to the chronicle of Pierozzi, Covatta (*Quarta*) was one of the places which "were completely devastated in these earthquakes. In some places there were victims, though perhaps not many, and in the case of others, I have not seen any number mentioned".

in totum desolate sunt ex dictis terremotibus. Et in aliquibus earum mortui sunt aliqui licet pauci, de aliis non vidi numerum designatum.

Durazzano (province of Benevento)

Most of its houses collapsed. Durazzano was a village of 74 hearths (estimated population: 370), and there were 30 victims (8.1%). The sources are Manetti's treatise and the chronicle of Pierozzi. According to Manetti: "Durazzano was completely torn to pieces and destroyed, and about thirty people were killed".

Durachianum, penitus laceratum ac destructum, triginta circiter personas occidit.

According to the chronicle of Pierozzi, Durazzano (*Duraynu*) was one of the places which "suffered appreciable harm in these earthquakes [...] they were not very badly damaged, and we are not told the number of victims".

notabile detrimentum receperunt ex ipsis terremotibus [...] non tantam ruinam passe sunt, numerus defunctorum non habetur descriptus.

Forlì del Sannio (province of Isernia)

A large proportion of its houses collapsed. Forlì was a village of 40 hearths (estimated population: 200), and there were 14 victims (7%).

The source is Manetti's treatise: "Forlì [del Sannio] was completely destroyed and fourteen people were killed".

Forlium totum eversum quatuordecim mortales interemit.

Fornelli (province of Isernia)

More than half its buildings collapsed, and the village walls were damaged. Fornelli was a village of 90 hearths (estimated population: 450), and there were 10 victims (2.2%).

The sources are a letter and a report dating to January 1457, Manetti's treatise, the contemporary chronicles of Francesco D'Angeluccio and Alessandro de Ritiis, and Astesano's poem. The sender and recipient of a letter of January 1457 are unknown: "The castle called Fravelle [Fornelli] the houses are in ruins, and so are the village walls, and the hill on which the village stands has strangely split open in several places".

Il castello detto Fravelle le case tutte guaste, e il muro di cinta pure, ed il monte del medesimo castello stranamente e in più luoghi spaccato.

The report of unknown authorship, probably dates to January 1457, was sent to cardinal Prospero Colonna: "Fornelli is completely destroyed and in ruins".

el Fornelo è tuto ruinato e disfato.

Manetti records: "Fornelli was more than half destroyed, and there were ten victims".

Fornellium, plusquam semirutum, decem mortales oppressit.

Fossalto [formerly Fossaceca] (province of Campobasso)

A large proportion of its houses collapsed. Fossaceca was a village of 86 hearths (estimated population: 430), and there were 10 victims (2.3%). The sources are Manetti's treatise and Pierozzi's chronicle. According to Manetti: "The same number of people [ten] died at Fossacceca [Fossalto], which was razed to the ground".

Fossa cognomine Ceca, ad solum eversa, totidem homines morti tradidit.

In Pierozzi's chronicle, *Fossaceca* (Fossalto) is included amongst places which "have been completely reduced to ruins by these earthquakes. In some of them there have been victims, though perhaps not many, and in the case of others, I have not seen any number mentioned".

in totum desolate sunt ex dictis terremotibus. Et in aliquibus earum mortui sunt aliqui licet pauci, de aliis non vidi numerum designatum.

Fragneto Monforte (province of Benevento)

It was completely destroyed. Fragneto was a town of 112 hearths (estimated population: 560), and more than 100 people perished (17.8%). The sources are Manetti's treatise and the chronicle of Pierozzi. According to Manetti: "Fragneto was completely razed to the ground, and a hundred people died there".

Franietum, totum a fundamentis eversum, centum hominum capita contrivit.

According to the chronicle of Pierozzi, Fragneto (*Fraginitu*) was one of the places which "suffered appreciable harm in these earthquakes [...] they were not very badly damaged, and we are not told the number of victims there".

notabile detrimentum receperunt ex ipsis terremotibus [...] non tantam ruinam passerunt, numerus defunctorum non habetur descriptus.

Guardiaregia (province of Campobasso)

A large proportion of its houses collapsed. Guardiaregia was a village of 65 hearths (estimated population: 325), and there were 30 victims (9.2%). The sources are Manetti's treatise and a document dated 9 March 1457. According to Manetti: "Guardia, also called Campochiaro, was completely destroyed, and about thirty people are known to have been killed there".

Custodium alterum nomine Campoclarii, omnino subrutum, triginta circiter defecisse intellexit.

A document dated 9 March 1457 and partially transcribed in Figliuolo 1988-89 (the original is in the Archivio di Stato in Naples, *Significatorie dei Relevi*, I, 1456-67, fol.47) states: "The town of Bojano is said to have been completely reduced to ruins in the earthquake; [...] the castle of Guardia di Campochiaro [Guardiaregia] is said to have suffered similar destruction".

Civitas Boiani, quod asseritur fuisse propter terremotum totaliter ruynatum; [...] castrum Guardie Campi Clari, quod asseruit fuisse similiter ruynatum.

Guardia Sanframondi (province of Benevento)

A large proportion of its houses collapsed. Guardia Sanframondi was a town of 150 hearths (estimated population: 750), and there were 70 victims (9.3%). The sources are two reports and a letter dating to December 1456 and January 1457, Manetti's treatise and Astesano's poem. The first report is attached to the letter of 22 December 1456 sent from Naples by the Milanese ambassador Antonio da Trezzo to duke Francesco Sforza: "Guardia Sanframondi has collapsed in ruins, and about one hundred people have been killed".

La Guardia de San Framondo è cascada et morte circha persone 100.

The letter was sent from Naples on 14 January 1457 by Pier Candido Decembrio to Cicco Simonetta, secretary to the duke of Milan: "Guardia Sanframondi lies in ruins, and almost all the inhabitants have been killed".

La Guadia de Raifalmondo tuto per terra, morti quasi tuti li habitanti.

The second report of unknown authorship, probably dates to January 1457, was sent to cardinal Prospero Colonna: "S.Agata has collapsed in ruins, and Guardia Sanframondi as well".

Santa Agatha sufondata, e la Guardia de San Framondo.

According to Manetti: "Guardia Sanframondi completely collapsed, and witnessed the death of about seventy people".

Custodium titulo Sancti Framundi, penitus subrutum, septuaginta circiter personas defunctas recognovit.

Lacedonia (province of Avellino)

Many houses collapsed. Lacedonia was a town of 195 hearths (estimated population: 975), and there were about 20 victims (2%). The sources are a letter of 12 December 1456, Manetti's treatise and Pierozzi's chronicle. The letter was sent from Foggia on 12 December 1456, and was written to marquis Luigi III Gonzaga by the Mantuan ambassador: "Ascoli di Puglia [Ascoli Satriano] has largely collapsed, and likewise Lacedonia".

Asoli di Puglia caduto in gran parte, similiter Lacedonia.

Manetti writes: "Lacedonia was badly shaken, and the shocks killed about twenty people".

Cutunium apprime concussum viginti circiter mortales sua concussionem necavit.

According to the chronicle of Pierozzi: "Lacedonia has been destroyed and laid waste, and most of its men, including the captain, have gone to meet their Lord".

Cotonia diruta et desolata tota, maiori parte hominum cum capitaneo ad Dominum inde migrante.

Limosano (province of Campobasso)

A large proportion of its houses collapsed. Limosano was a town of 112 hearths (estimated population: 560), and there were 40 victims (7.1%). The sources are Manetti's treatise and the chronicle of Pierozzi. According to Manetti: "Limosano collapsed in ruins and about forty people were crushed to death. [...] Limosano was razed to the ground, and mourned the death of about forty people".

Limosanum, ad solum usque collapsum, quadraginta circiter personas contrivit. [...] Limosanum, totum humi procubens, quadraginta circiter mortales delevit.

Pierozzi writes: "Limosano was completely destroyed, and 35 people died in the ruins".

In Limosanu diruta in totum, ruina XXXV absumpsit.

Miranda (province of Isernia)

A large proportion of its houses collapsed. Miranda was a village of 25 hearths (estimated population: 125), and there were 5 victims (4%). The sources are Manetti's treatise and one contemporary chronicle. According to Manetti: "Miranda was largely reduced to ruins, and five people were killed".

Mirandia, in maiori eius portione devastata, quinque personas obtrivit.

According to Nicola della Tuccia: "the towns listed below were all razed to the ground. [...] Miranda had 2 victims [...] All these towns completely collapsed".

Queste terre sottoscritte furno tutte spianate. [...] Miranda morti 2 [...] Tutte le dette terre cascorno del tutto.

Montecalvo Irpino (province of Avellino)

A large proportion of its houses collapsed. Montecalvo was a town of 205 hearths (estimated population: 1,025), and there were 80 victims (7.8%). The sources are a report dating to January 1457, Manetti's treatise and the chronicle of Pierozzi. The report of unknown authorship, probably dates to January 1457, was sent to cardinal Prospero Colonna: "Alife [...] Monte Calvo [...] Biccari, some of these have been destroyed, and others largely reduced to ruins".

Aliphe [...] Monte Calvo [...] Biccari, chi in abisso e chi ruinato in gran parte.

According to Manetti: "Montecalvo [Irpino] was almost completely destroyed in this disaster, and eighty people perished there".

Moncalvum, pene totum hac clade vastatum, cum octuaginta personarum internitione dignoscitur.

Pierozzi writes: "The castle of Montecalvo was largely destroyed and 88 people killed".

[Castrum] quod dicitur Montecalvi pro maiori parte destructum, e medio LXXXVIII subtractis personis.

Montecorvino (province of Foggia)

There were a great many collapses and the settlement was abandoned. Montecorvino was a village of 12 hearths (estimated population: 60), and there were 12 victims (20%). The castle ruins can be found near Motta Montecorvino. The sources are a report dating to January 1457 and Manetti's treatise. The report is of unknown authorship, probably dates to January 1457, was sent to cardinal Prospero Colonna: "Alife [...], Montecorvino, Biccari, have been either totally or largely destroyed".

Aliphe [...], Montecorvino, Biccari, chi in abisso e chi ruinato in gran parte.

According to Manetti: "Montecorvino lies completely desolate, without a single inhabitant: but not more than about 12 people were killed there".

Moncorvinum penitus desolatum sine ullis habitatoribus remansit: nam duodecim circiter et non plures incolas omnes occidit.

Montoro Superiore (province of Avellino)

There was some damage, but its exact extent is not known. The source is a report of unknown authorship, probably dating to January 1457, and sent to cardinal Prospero Colonna: Montoro Superiore (*Monterdone*) is included in a list of places struck by the earthquake, but for which the writer does not specify the effects.

Oratino (province of Campobasso)

A large proportion of its houses collapsed. Oratino was a village of 47 hearths (estimated population: 235), and there were 10 victims (4.2%). The sources are a letter dated 7 December 1456, Manetti's treatise and the contemporary chronicles of Pierozzi and Jean Chartier. The letter is from Ercole d'Este to his brother Borso, and was sent from Foggia on 7 December 1456: "The *contado* of Molise, that is to say Campobasso, Oratino [...] and many other towns have been reduced to ruins, and all their inhabitants killed".

Il contado de Molixe, cioè Campobasso, Lo Raffino [...] e molte altre terre sono submerse cum tuta zente.

According to Manetti: "Ten people perished in the collapse of the little town of Oratino".

Lauratinum, parvum quoddam opidum, humi prostratum, decem homines corruens necavit.

According to the chronicle of Pierozzi, Oratino (*Loratinu*) was one of the places which "suffered appreciable harm in these earthquakes [...] they were not very badly damaged, and we are not told the number of victims".

notabile detrimentum receperunt ex ipsis terremotibus [...] non tantam ruinam passe sunt, numerus defunctorum non habetur descriptus.

Pago Veiano (province of Benevento)

A large proportion of its houses collapsed. Pago was a village of 28 hearths (estimated population: 140), and there were 6 victims (4.2%). The source is Manetti's treatise:

"Pago, belonging to the marquis of Pescara, was completely destroyed, and six people were crushed to death".

Pagus quidam marchionis Piscarie, penitus destructus, sex homines oppressit.

Palma Campania (province of Naples)

There was some damage, but its exact extent is not known. The source is a report of unknown authorship, probably dating to January 1457, and sent to cardinal Prospero Colonna: Palma is included in a list of places struck by the earthquake, but for which the writer does not specify the effects.

Pesche (province of Isernia)

Most of its houses collapsed, as well as the parish church. Pesche was a village of 35 hearths (estimated population: 175), and there were 30 victims (17.1%). The sources are Manetti's treatise and a *Notula* in the margin of a codex 47 in the Archivio dell'Abbazia of Montecassino. According to Manetti: "Pesche was largely reduced to ruins, and thirty people were killed in the collapse".

Pisthium cognomine Sarnianum, totum funditus eversum, triginta homines delevit.

The *Notula*: "In the same way [as at San Pietro Avellana], the church in the castle of Pesche di Isernia collapsed, and its archpresbyter and many other people were buried under its walls and killed".

Similiter in castro Pesclarum de Ysernia ruit ecclesia, et archipresbiter loci ejusdem cum multis occisi ac muris tumulati extiterunt.

Pescolanciano (province of Isernia)

A large proportion of its houses collapsed. Pescolanciano was a village of 14 hearths (estimated population: 70), and there were 10 victims (14.2%). The sources are Manetti's treatise and the chronicle of Pierozzi. According to Manetti: "Pescolanciano was largely destroyed, and ten people died in the ruins".

Pisthium, plerumque vastatum, decem homines sua ruina interfecit.

According to Pierozzi, Pescolanciano (*Peschiri*) was one of the places which "were completely devastated in these earthquakes. In some places there were victims, though perhaps not many, and in the case of others, I have not seen any number mentioned".

in totum desolate sunt ex dictis terremotibus. Et in aliquibus earum mortui sunt aliqui licet pauci, de aliis non vidi numerum designatum.

Pettoranello del Molise [formerly Pettorano] (province of Isernia)

A large proportion of its houses collapsed. Pettorano was a village of 20 hearths (estimated population: 100), and there were 7 victims (7%). The sources are Manetti's treatise and the chronicle of Pierozzi. According to Manetti: "Pettoranello [Pettorano] (near Isernia, mentioned above) collapsed in ruins and seven people were crushed to death.

Petoranellum, commemorate Sernie finitimum, humi prostatum septem personas oppressit.

According to Pierozzi, Pettorano (*Peturanu*) was one of the places which "were completely devastated in these earthquakes. In some places there were victims, though perhaps not many, and in the case of others, I have not seen any number mentioned".

in totum desolate sunt ex dictis terremotibus. Et in aliquibus earum mortui sunt aliqui licet pauci, de aliis non vidi numerum designatum.

Pietraroja (province of Benevento)

There was some damage, but its extent is not exactly known. The source is a report of unknown authorship, probably dating to January 1457, sent to cardinal Prospero Colonna: Pietraroja (*Petra Nova*) is included in a list of places struck by the earthquake, but for which the writer does not specify the effects.

Pontecorvo (province of Frosinone)

There was some damage, but its exact extent is not known. The source is a report of unknown authorship, probably dating to January 1457, and sent to cardinal Prospero Colonna: Pontecorvo is included in a list of places struck by the earthquake, but for which the writer does not specify the effects.

Pontelandolfo (province of Benevento)

More than half its houses collapsed. Pontelandolfo was a town of 144 hearths (estimated population: 720), and there were about 20 victims (2.7%). The sources are Manetti's treatise and Pierozzi's chronicle. According to Manetti: "Pontelandolfo was more than half destroyed, and about twenty people met their death".

Landulfum, plusquam semirutum, viginti circiter ad inferos transmisit.

In Pierozzi's chronicle, the damage seems to be less severe than Manetti suggests, for Pontelandolfo (*Ponte Landolphu*) is included amongst places which "have suffered substantial damage from the earthquakes [...] Of the places listed, which did not suffer serious damage, the number of victims is not known".

notabile detrimentum receperunt ex ipsis terraemotibus [...] non tantam ruinam passe sunt numerus defunctorum non habetur descriptus.

Pratola Peligna (province of L'Aquila)

Suffered serious damage. The sources are two contemporary L'Aquila chronicles. Francesco D'Angeluccio's chronicle records: "And in Abruzzo [the earthquake] caused a great deal of damage. Especially at Fornelli [...] and Pratola [...]".

E in Abruzzo fe' danno assai. In espiziale a lu Fornellio [...] e a Pratola [...].

Alessandro de Ritiis' chronicle reports: "in Abruzzo the earthquake did great damage [...] Similarly at Fornelli [...], and Pratola".

in Abbrutio fecit magnum scandalum [...] Item allo Fornello [...], in Pratula.

Reino (province of Benevento)

Most of its houses collapsed. Reino was a village of 17 hearths (estimated population: 85), and there were 15 victims (17.6%). The sources are Manetti's treatise and the chronicle of Pierozzi. According to Manetti: "Reino was completely destroyed, and fifteen people were mourned".

Reginium, omnino destructum, quindecim personas desideravit.

According to the chronicle of Pierozzi, Reino (*Rechinu*) was one of the places which "suffered appreciable harm in these earthquakes [...] they were not very badly damaged, and we are not told the number of victims there".

notabile detrimentum receperunt ex ipsis terraemotibus [...] non tantam ruinam passe sunt, numerus defunctorum non habetur descriptus.

Riccìa (province of Campobasso)

A large proportion of its houses collapsed, and there were many victims. The sources are a letter and a report dating to December 1456 and January 1457, one contempo-

rary chronicle and Astesano's poem. The letter is from Ercole d'Este to his brother Borso, and was sent from Foggia on 7 December 1456: "The *contado* of Molise, that is to say Campobasso [...] Riccia, and many other places have been reduced to ruins and all their inhabitants killed [...] many other places belonging to the count of Altavilla have been completely destroyed".

Il contado de Molixe, cioè Campobasso [...] Rippa e molte altre terre sono submerse cum tuta zente [...] molte altre terre del conte di Altavilla sono andate in profundo.

The report of unknown authorship, probably dates to January 1457, was sent to cardinal Prospero Colonna: Riccia (*la Riccia*) is included in a list of places which suffered damage, but the author does not specify the extent of the damage. Earthquake effects at Riccia are also recorded in the French chronicle of Jean Chartier.

Rionero Sannitico (province of Isernia)

A large proportion of its houses collapsed. Rionero was a village of 33 hearths (estimated population: 165), and there were 18 victims (10.9%). The sources are Manetti's treatise and the chronicle of Pierozzi. According to Manetti: "Rionero [Sannitico] was completely destroyed, and eight people were killed".

Riginerium, omnino devastatum, decem et octo homines necavit.

According to Pierozzi, Rionero Sannitico (*Riginiru*) was one of the places which "were completely devastated in these earthquakes. In some places there were victims, though perhaps not many, and in the case of others, I have not seen any number mentioned".

in totum desolate sunt ex dictis terremotibus. Et in aliquibus earum mortui sunt aliqui licet pauci, de aliis non vidi numerum designatum.

Ripalimosani [formerly Ripalimosano] (province of Campobasso)

This is described as being completely destroyed. The bell-tower of the parish church was rebuilt in 1463. Ripalimosano was a town of 128 hearths (estimated population: 640), and there were 12 victims (1.8%). The sources are Manetti's treatise and an inscription dating to 1463. According to Manetti: "Ripalimosano, as it is usually called, was razed to the ground, and twelve people were killed".

Ripa cognomento Limosani, ceu vulgo nuncupatur, tota a fundamentis eversa, duodecim homines interemit.

A bronze inscription, now lost, recorded the rebuilding of the bell-tower of the parish church in 1463. The text of the inscription, which does not explicitly refer to the earthquake, is transcribed in the parish registers (Magri and Molin 1984, p.138): "The arch-priester of Ripa[limosano], Angelo d'Eramo, had this bell-tower built in AD 1463".

Hoc campanile R. Angelus d'Eramo Archipraesbyter Ripae fieri curavit A.D. 1463.

Rivisondoli (province of LAquila)

Some of its houses collapsed. Rivisondoli was a village of 34 hearths (estimated population: 170), and there were 7 victims (4.1%). The source is Manetti's treatise: "Rivisondoli suffered as many collapses as Pesche [Pescolanciano], a place we have already mentioned, and seven people were crushed to death there".

Rigosomnulum, instar predicti Pisthi pariter lapsum, septem mortales oppressit.

Roccacinquemiglia (province of LAquila)

A large proportion of its houses collapsed. Roccacinquemiglia was a village of 26 hearths (estimated population: 130), and there were 20 victims (15.3%). The sources

are a letter probably dating to January 1457, Manetti's treatise, the contemporary chronicle of Pierozzi and the Brescian chronicle of Corradino di Palazzo. The letter probably dates to January 1457, but the sender and recipient are unknown: "It is not possible to recognise where and what kind of a place Roccacinquemiglia was".

La Rocca Cinquemiglia non si può riconoscere come e dove sia stata.

According to Manetti: "Another fortress called Cinque Miglia was completely destroyed, killing about twenty people".

Arx altera nomine Quinque Milium penitus destructa viginti circiter homines occidit.

According to the chronicle of Pierozzi: "The fortresses of Valleoscura, Raso and Cinquemiglia were completely destroyed and some people were killed".

Arces Vallisobscure et Rasu et Quinqueville in totum destructe, mortuis inde aliquibus.

Roccapia [formerly **Roccavalleoscura**] (province of L'Aquila)

Many houses collapsed. Roccavalleoscura was a village of 40 hearths (estimated population: 200), no-one was killed. The sources are a report, probably dates to January 1457, Manetti's treatise, Pierozzi's chronicle and Astesano's poem. The report is of unknown authorship and was sent to cardinal Prospero Colonna: "La Rocca di Valle Scura [Roccapia] and other villages are all abandoned".

la Rocha de Valle Scura, con altre terre, tutte diserte.

According to Manetti: "La Rocca di Valle Scura [Roccapia] seems to have collapsed in ruins, but amazingly, no-one was killed".

Arx Vallis Obscure ad solum eversa sine ulla humani capitis interemptione mirabile dictu remansisse videtur.

In Pierozzi's chronicle, effects at Roccapia are listed together with those at the fortresses of Roccaraso (Raso) and Roccacinquemiglia (Cinquenville). For the latter two, see the entries concerned: "The fortresses of Valle Scura, Raso and Cinquenville were completely destroyed, and there were some victims".

Arces Vallisobscure et Rasu et Quinqueville in totum destructe, mortuis inde aliquibus.

Roccarainola (province of Naples)

There was some damage, but its exact extent is not known. The source is a report of unknown authorship, probably dating to January 1457, and sent to cardinal Prospero Colonna: Roccarainola (*Castel de la Rocha de Janula*) is included in a list of places struck by the earthquake, but for which the writer does not specify the effects.

Roccaraso (province of L'Aquila)

Much of it collapsed. Roccaraso was a village of 31 hearths (estimated population: 155), and there were 20 victims (12.9%). The sources are Manetti's treatise and three contemporary chronicles. According to Manetti: "A third fortress, commonly called Raso, collapsed in ruins, crushing twenty people".

Arx tertia vulgato verbo Rasi nuncupata, funditis diruta, viginti mortalium capita confregit.

According to the chronicle of Pierozzi: "The fortresses of Valleoscura, Raso and Cinquemiglia were completely destroyed and some people were killed".

Arces Vallisobscure et Rasu et Quinqueville in totum destructe, mortuis inde aliquibus.

Earthquake effects at Roccaraso are also recorded in the L'Aquila chronicles of Francesco D'Angeluccio and Alessandro de Ritiis.

Roccaspromonte (province of Campobasso)

Much of it collapsed. Roccaspromonte was a village of 16 hearths (estimated population: 80), and there were 4 victims (5%). The sources are Manetti's treatise and the chronicle of Pierozzi. According to Manetti: "Another small fortress, commonly called Rucella [Roccaspromonte], collapsed in ruins, killing four people".

Arx parva altera vulgato verbo Rucella, humi prostata, quatuor homines interfecit.

According to Pierozzi, Roccaspromonte (*Rochella*) was one of the places which "were completely devastated in these earthquakes. In some places there were victims, though perhaps not many, and in the case of others, I have not seen any number mentioned".

in totum desolate sunt ex dictis terremotibus. Et in aliquibus earum mortui sunt aliqui licet pauci, de aliis non vidi numerum designatum.

Rocchetta a Volturno (province of Isernia)

Much of it collapsed, and 15 people were killed. The sources are Manetti's treatise and the chronicle of Pierozzi. According to Manetti: "At the small fortress which is commonly called Rocchetta [a Volturno] about fifteen people were killed".

Arx parva, que vulgatiore verbo Rocheta nuncupatur, quindecim circiter homines peremit.

According to the chronicle of Pierozzi, Rocchetta a Volturno (*Rochetta*) was one of the places which "were completely devastated in these earthquakes. In some places there were victims, though perhaps not many, and in the case of others, I have not seen any number mentioned".

in totum desolate sunt ex dictis terremotibus. Et in aliquibus earum mortui sunt aliqui licet pauci, de aliis non vidi numerum designatum.

San Bartolomeo in Galdo (province of Benevento)

There was some damage, but its extent is not exactly known. The source is a report of unknown authorship, probably dating to January 1457, and sent to cardinal Prospero Colonna: San Bartolomeo in Galdo (*San Bartholomeo*) is included in a list of places which suffered damage but for which the author does not indicate its extent.

San Clemente a Casauria (province of Pescara)

Suffered serious damage. The source is the L'Aquila chronicle of Alessandro de Ritiis, who has left us a vivid account of his lucky escape from the earthquake effects: "in Abruzzo it caused great destruction [...] The same thing [happened] [...] at Torre di San Clemente where, if I had not obeyed the venerable brother Evangelista, who was then custodian of the convent of S.Andrea near the town of Chieti, I would have been killed along with my companion brother Matteo da Bologna, for we were intending to return to our convent at Capistrano for the feast of St.Andrew, and here is why we would have been killed: there then lived at San Clemente the families of the very kind-hearted Nicola and Rainaldo di Sanguino, whose wives, and especially Todesca, always gave the friars hospitality when they passed that way because of their special warmth for the friars, and they made up a bed in the church tower under the bell, and when we went to the feast I have mentioned, that is where we and our companion would sleep. But the earthquake caused the bell to fall on to the bed I have mentioned, and so we would surely have been killed, for we were expecting our usual hospitality there. But, as I have said, the above-mentioned brother custodian would not allow us to leave".

in Abbrutio fecit magnum scandalum [...] Item [...] in turri Sancti Clementis ubi nisi obedientia venerabilis patris fratris Evangeliste, guardiani tunc loci Sancti Andree prope civitatem Thetis, ego fuisset mortuus cum nostro socio fratre Matteo de Bononia qui reddere volebamus ad nostrum locum Capistranj, quia ivimus ad festum Sancti Andree, et ratio quare mortuij fuisset est ista, quia in Sancto Clemente tunc habitabat familia devotissimi domini Nicolay et domini Raynaldj de Sanguino, quorum mulieres precipue domina Todescha, semper quando fratres inde transitum habuissent, hospitarj apud illas propter singularissimam devotionem quam gerebant ad fratres faciebant, et paraverant lectum ad dormiendum in turri ipsius ecclesie subtus campanam, ubi quando ivimus ad dictum festum dormivimus simul cum nostro socio. Et in dicto terremoto cecidit dicta campana super lectum prenominatum, et sic credo omnino fuisset mortuij quia volebamus in dicto sero ibidem hospitarj. Sed, ut dixi, predictus pater guardianus noluit permittere ut recederemus.

San Massimo (province of Campobasso)

A large proportion of its houses collapsed. San Massimo was a village of 64 hearths (estimated population: 320), and there were 25 victims (7.8%). The sources are a report probably dating to January 1457, Manetti's treatise, the chronicle of Pierozzi and Astesano's poem. The report of unknown authorship was sent to cardinal Prospero Colonna: San Massimo (*Sancto Maximo*) is included in a list of places which suffered damage, but the author does not specify the extent of the damage. According to Manetti: "San Massimo completely collapsed in ruins, killing twenty-five people".

Castrum titulo Sancti Maximi, totum humi prostratum, viginti quinque personas occidit.

According to Pierozzi, San Massimo (*sancti Maxin*) was one of the places which "were completely devastated in these earthquakes. In some places there were victims, though perhaps not many, and in the case of others, I have not seen any number mentioned".

in totum desolate sunt ex dictis terremotibus. Et in aliquibus earum mortui sunt aliqui licet pauci, de aliis non vidi numerum designatum.

San Pietro Avellana (province of Isernia)

A large proportion of its houses collapsed, as well as a tower and half the church. San Pietro was a village of 32 hearths (estimated population: 160), and there were 30 victims (18.7%). The sources are a report dating to January 1457, Manetti's treatise and a *Notula* in the margin of the codex 47 in the Archivio dell'Abbazia of Montecassino. The report of unknown authorship, probably dates to January 1457, was sent to cardinal Prospero Colonna: San Pietro Avellana (*S. Piero*) is included in a list of places which suffered damage, but the author does not specify the extent of the damage. According to Manetti: "As it collapsed, San Pietro Avellana (as it is called in our language) crushed all its inhabitants, to the number of about thirty, and every single one was killed".

Sanpetrus cognomine Avellani, sic nanque materno sermone appellatur, cunctos incolas numero circiter triginta ita sua ruina oppressit, ut omnes ad unum morerentur.

The *Notula*: "At the castle of San Pietro Avellana, where lies the body of the glorious confessor of Christ, Our Friend, the great tower collapsed, together with half the church dedicated to him; and almost 20 people died there as well".

In castro autem Sancti Petri de Avellana, ubi corpus glori confessori Christi Amici requiescit, cecidit turris magna quasi cum medietate ecclesie dicti confessoris. Ubi etiam mortui fuerunt homines fere XX.

Santa Maria di Realvalle (province of Salerno)

The monastery buildings suffered substantial damage. Few remains of the abbey survive today. The source is a brief issued by pope Calixtus III in May 1457, authorising

the commendatory abbot of the abbey of S.Maria di Realvalle to sell some of its property in order to pay for repairs needed by the abbey (Archivio Segreto Vaticano, *Registra Vaticana*, 447, fol.255v). The document is quoted in Figliuolo (1988-89): "Because of the earthquake in that region in recent days, the monastery of S.Maria di Realvalle, of the Cistercian Order, in the diocese of Nola, has need of very substantial repairs to its collapsed structures and buildings [...]"

Monasterium Sancte Marie de Regalivalle cistercensis ordinis Nolane diocesis propter terremotum in partibus illis superioribus diebus contingens in suis structuris et edifiitiis collapsum maxima indigeret reparatione [...].

Santa Maria in Galdo Mazzocca (province of Benevento)

The church, its bell-tower, and the convent living quarters and the whole of locality collapsed. All that remains today of the abbey of S.Maria are a few ruins on Monte San Marco, near Foiano in Valfortore. The source is a *Notula* made by a direct witness and appears in a register of deaths from the abbey of Santa Maria del Galdo (the manuscript is in the Biblioteca Apostolica Vaticana, *Vaticani Latini*, 5949, fol.247r): "In the year of Our Lord 1456, in the fifth indiction, during the night succeeding the 4th day of the month of December, between the eleventh and the twelfth hour, there was a great earthquake. The church was destroyed, together with the bell-tower and the living quarters, and the whole of our locality as well".

Anno Domini M^oCCCC^oLVI, quinta indictione, die IIII mensis decembris, nocte venientem inter undecima et duodecima hora, fuit magnus terremotus. Fuit ecclesia cum campanilis et habitacionem dextructa, et eciam totam patriam.

Sant'Angelo Limosano (province of Campobasso)

Some houses collapsed, while others remained standing. Sant'Angelo Limosano was a village of 41 hearths (estimated population: 205), and there were 5 victims (2.4%). The sources are Manetti's treatise, Pierozzi's chronicle and Astesano's poem. According to Manetti: "part of Sant'Angelo Limosano (as it is commonly called) collapsed, and part remained standing. Only five people met their deaths".

Sanctangelus Limosani, ita enim vulgo nuncupatur, partim corruens, partim vero commanens, quinque duntaxat capita ad necem dedit.

In Pierozzi's chronicle, Sant'Angelo (*Santalgelu*) is included amongst places which "have been completely laid waste by these earthquakes. In some cases there were victims, though perhaps not many, and in others I have not seen any number mentioned".

in totum desolate sunt ex dictis terremotibus. Et in aliquibus earum mortui sunt aliqui licet pauci, de aliis non vidi numerum designatum.

Sarno (province of Salerno)

There was some damage, but its exact extent is not known. The source is a report of unknown authorship, probably dating to January 1457, and sent to cardinal Prospero Colonna: *Sarno del conte di Nola* is included in a list of places struck by the earthquake, but for which the writer does not specify the effects.

Sassinoro (province of Benevento)

A large proportion of its houses collapsed. Sassinoro was a village of 55 hearths (estimated population: 275), and there were 6 victims (2.1%). The sources are a report, probably dating to January 1457, Manetti's treatise, the contemporary chronicles of Pierozzi and Jean Chartier, and Astesano's poem. The report of unknown authorship was sent to cardinal Prospero Colonna: Sassinoro (*Cassione*) is included in a list of places which suffered damage, but the author does not specify the extent of the dam-

age. According to Manetti: "Sassinoro was razed to the ground, and mourned the death of six people in the ruins".

Sessanum, ad solum erutum, sex personas ea ruina defunctas desideravit.

According to the chronicle of Pierozzi, Sassinoro (*Sexana*) was one of the places which "suffered appreciable harm in these earthquakes [...] they were not very badly damaged, and we are not told the number of victims".

notabile detrimentum receperunt ex ipsis terremotibus [...] non tantam ruinam passe sunt, numerus defunctorum non habetur descriptus.

Scapoli (province of Isernia)

A large proportion of its houses collapsed. Scapoli was a village of 53 hearths (estimated population: 265), and there were 15 victims (5.6%). The sources are Manetti's treatise and the chronicle of Pierozzi. According to Manetti: "Scapoli was completely destroyed, and fifteen people perished there".

Scapolium, penitus confractum, quindecim personas extinxit.

According to Pierozzi, Scapoli (*Scauli*) was one of the places "which were completely devastated in these earthquakes. In some places there were victims, though perhaps not many, and in the case of others, I have not seen any number mentioned".

in totum desolate sunt ex dictis terremotibus. Et in aliquibus earum mortui sunt aliqui licet pauci, de aliis non vidi numerum designatum.

Sepino (province of Campobasso)

A large proportion of its houses collapsed. Sepino was a town of 234 hearths (estimated population: 1,170), and there were 60 victims (5.1%). The sources are two reports and a letter dating to December 1456 and January 1457, Manetti's treatise, the chronicle of Pierozzi, the French chronicle of Jean Chartier and Astesano's poem. The first report is attached to the letter of 22 December 1456 sent from Naples by the Milanese ambassador Antonio da Trezzo to duke Francesco Sforza: "Sepino lies completely in ruins, and almost all those who lived there have been killed".

Spino tutto spianato et morti quasi tutti quelli gli habitavano.

The letter was sent from Naples on 14 January 1457 by Pier Candido Decembrio to Cicco Simonetta, secretary to the duke of Milan: "Sepino lies in ruins, and nearly all the local people have been killed".

Supino in tuto spianato, morti quasi tuti li habitanti del locho.

The second report of unknown authorship, probably dates to January 1457, was sent to cardinal Prospero Colonna: Sepino (*Suppino*) is included in a list of places which suffered damage, but the author does not specify the extent of the damage.

According to Manetti: "The castle of Supinio, which was called Sepino by the writers of old, completely collapsed, and witnessed the death of sixty people".

Supinum castellum, olim Sepinum a priscis scriptoribus appellatum [...] penitus collapsum, sexaginta personas interemptas recognovit.

According to the chronicle of Pierozzi, Sepino (*Supimu*) was one of the places which "suffered appreciable harm in these earthquakes [...] they were not very badly damaged, and we are not told the number of victims".

notabile detrimentum receperunt ex ipsis terremotibus [...] non tantam ruinam passe sunt, numerus defunctorum non habetur descriptus.

Sessano del Molise (province of Isernia)

A large proportion of its houses collapsed. Sessano was a village of 54 hearths (estimated population: 270), and there were 10 victims (3.7%). The sources are Manetti's treatise, the contemporary chronicle of Pierozzi and the *Cronaca di Viterbo* of Nicola della Tuccia. According to Manetti: "Messamolio [Sessano del Molise] was completely destroyed, and as many people [ten] lost their lives there".

Messamolium, prorsus destructum, totidem personas occidit.

According to Pierozzi, Sessano del Molise (*Sexanola*) was one of the places which "were completely devastated in these earthquakes. In some places there were victims, though perhaps not many, and in the case of others, I have not seen any number mentioned".

in totum desolate sunt ex dictis terremotibus. Et in aliquibus earum mortui sunt aliqui licet pauci, de aliis non vidi numerum designatum.

Spina (province of Isernia)

A large proportion of its houses collapsed. Spina was a village of 8 hearths (estimated population: 40), and there were 8 victims (20%). The sources are Manetti's treatise and the chronicle of Pierozzi. According to Manetti: "Spina was completely razed to the ground, and eight people were crushed to death".

Spina, tota ad humum conversa, octo personas obtrivit.

According to the chronicle of Pierozzi: "Acquaviva was badly damaged and 35 people lost their lives. Cercemaggiore and another place called Spina collapsed to the same extent. In the former 40 people were killed, and in the latter, 46".

Aqua viva tota quassata XXXV de hac luce subtracti sunt. Chercum et alia dicta Spina pariter corruerunt, et in prima XL, in secunda XLVI, in pace quieverunt.

Spinete (province of Campobasso)

A large proportion of its houses collapsed. Spinete was a village of 65 hearths (estimated population: 325), and there were 30 victims (9.8%). The sources are Manetti's treatise and the contemporary chronicles of Pierozzi and Nicola della Tuccia. According to Manetti: "The town of Spinete was badly damaged. Some houses collapsed and there were about thirty victims".

Spinetum opidum, apprime concussum, nonnullarum domorum ruinam et triginta circiter personarum internitionem toleravit.

According to the chronicle of Pierozzi, Spinete (*Speneta*) was one of the places which "were completely devastated in these earthquakes. In some places there were victims, though perhaps not many, and in the case of others, I have not seen any number mentioned".

in totum desolate sunt ex dictis terremotibus. Et in aliquibus earum mortui sunt aliqui licet pauci, de aliis non vidi numerum designatum.

Sprondasino (province of Isernia)

A large proportion of its houses collapsed. Sprondasino was a village of 34 hearths (estimated population: 170), and there were 6 victims (3.5%). The sources are Manetti's treatise and the chronicle of Pierozzi. According to Manetti: "Sprondasino collapsed in ruins, killing six people".

Spronasmus, funditus corruens, sex personas interemit.

According to the chronicle of Pierozzi, Sprondasino (*Sprunasinu*) was one of the places which "were completely devastated in these earthquakes. In some places

there were victims, though perhaps not many, and in the case of others, I have not seen any number mentioned".

in totum desolate sunt ex dictis terremotibus. Et in aliquibus earum mortui sunt aliqui licet pauci, de aliis non vidi numerum designatum.

Torella del Sannio (province of Campobasso)

A large proportion of its houses collapsed. Torella was a village of 37 hearths (estimated population: 135), and there were 8 victims (4.3%). The sources are Manetti's treatise and the chronicle of Pierozzi. According to Manetti: "Torella [del Sannio] was completely razed to the ground and witnessed the death of eight people".

Terella, tota humi prostrata, octo mortuos recognovit.

According to Pierozzi, Torella del Sannio (*Terella*) was one of the places which "were completely devastated in these earthquakes. In some places there were victims, though perhaps not many, and in the case of others, I have not seen any number mentioned.

in totum desolate sunt ex dictis terremotibus. Et in aliquibus earum mortui sunt aliqui licet pauci, de aliis non vidi numerum designatum.

Toro (province Campobasso)

A large proportion of its houses collapsed. Toro was a village of 96 hearths (estimated population: 480), and there were 40 victims (8.3%). The sources are Manetti's treatise and the chronicle of Pierozzi. According to Manetti: "Toro was completely destroyed, and forty people were crushed to death in the collapse".

Tuorium, totum funditus eversum, ruina sua quadraginta hominum capita obrivit.

According to the chronicle of Pierozzi: "Toro suffered similar destruction [was razed to the ground], and 35 lives were lost".

Tueru similem passa conquassationem [ad solum usque deducta] XXXV personas amisit.

Torre de' Passeri (province of Pescara)

A large proportion of its houses collapsed. Torre was a village of 24 hearths (estimated population: 120), and there were 15 victims (12.5%). The sources are Manetti's treatise, the L'Aquila chronicles of Francesco D'Angeluccio and Alessandro de Ritiis, and Astesano's poem. According to Manetti: "A certain place called simply Torre, and belonging to the above-mentioned duke [of Sora], completely collapsed, killing fifteen people".

Turris quedam sine alio nomine predicti ducis, omnino corruens, quindecim mortales oppressit.

Tufara (province of Campobasso)

There was some damage, but its exact extent is not known. The source is a report of unknown authorship, probably dating to January 1457, and sent to cardinal Prospero Colonna: Tufara (*la Toffara*) is included in a list of places struck by the earthquake, but for which the writer does not specify the effects.

Vittorito (province of L'Aquila)

There was serious damage. The source is the L'Aquila chronicle of Francesco D'Angeluccio: "and throughout the kingdom [of Naples] [the earthquake] did a great deal of damage, and in Abruzzo it caused serious damage. Especially at Fornelli [...] and Vittorito [...]".

e per tutto lu Reame fe' grannissimo danno, e in Abruzzo fe' danno assai. In espiziale a lu Fornellio [...] e a Vettorita.

Vitulano (province of Benevento)

A large proportion of its houses collapsed. The source is a report of unknown authorship, probably dates to January 1457, sent to cardinal Prospero Colonna: "Vitulano in the Tocco valley is in ruins".

Vitulano ne la valle de Toccho, rovinato.

Volturino (province of Foggia)

A large proportion of its buildings collapsed. Volturino was a village of 59 hearths (estimated population: 295), and there were 5 victims (1.6%). The sources are Manetti's treatise, one contemporary chronicle and Astesano's poem. According to Manetti: "Volturino is a different town from Capua, though it once had that name, and it is near Lucera, a town already mentioned. It was half destroyed, but only five people were killed in the collapse".

Vulturnium alterum a Capua olim sic nuncupata, finitimum preeiecte Lucerie opidum semivastatum suo casu quinque duntaxat personas interemit.

According to the chronicle of Picrozzi, Volturino (*Vulturinum*) was one of the places which were "largely destroyed" (*in magna parte destructis*).

Benevento

About 50 houses completely collapsed, and the surviving dwellings were rendered uninhabitable. One church building which collapsed was the cathedral, and the city walls were also damaged. There were 400 victims.

The sources are 13 letters and three reports written between 6 December 1456 and the end of January 1457, Manetti's treatise, two briefs issued by pope Pius II, ten contemporary chronicles and Astesano's poem.

The first letter was written to duke Francesco Sforza by the Milanese ambassador, Antonio da Trezzo, and was sent from Naples on 6 December 1456: "At [...] Benevento [...] and many other towns and castles, [the earthquake] has done equally serious damage, but especially at Benevento".

Ad [...] Benevento [...] et in molte altre città et castelle è simelmente facto grande danno et maxime Benevento.

The second letter is from Ercole d'Este to his brother Borso, and was sent from Foggia on 7 December 1456: "At Benevento, part of the castle has collapsed".

Benivento parte del castello per terra.

The third letter was sent from Naples on 7 December 1456 by the Siencese ambassador, Bindo Bindi, to the authorities of the Siencese Republic: "More than 500 people have been killed at Benevento".

Ad Benivento moriti più de 500 persone.

The fourth letter was sent from Naples on 8 December 1456 by Giannozzo Manetti to his brother Filippo: "What follows is an account of the castles and villages which have been struck by this scourge: [...] Benevento [...] suffered the worst damage [...]".

Quello che seguirà sarà il singnifichato delle chastella e delle terre che questo fragello à percosse: [...] Benevento [...] à ricevuto maggiore danno [...].

The fifth letter was sent from Naples on 8 December 1456 by Giannozzo Manetti to the Florentine *Signoria*: Benevento is included amongst places where the earthquake "has done a certain amount of damage, depending on the nature of the sites and the quality of the buildings; and a huge number of inhabitants have fled".

à fatti varii danni, secondo la varietà de' siti e lla qualità d'edificii, e grande e innistimabile 'vasione degli abitanti.

The sixth letter was sent from Naples on 8 December 1456 by Giannozzo Manetti to Vespasiano da Bisticci: Benevento is included amongst places "has struck to a greater or lesser extent, causing varying amounts of damage according to the vulnerability and position of the places concerned, for in some of the above-mentioned villages it seriously damaged their walls, in others it demolished houses, and yet others collapsed into the ground, thereby killing many people".

ha percosso variamente, et facto varij danni secondo la debolezza et sito de' luoghi, peroché a parte delle terre predecite ha frachassate le mura, a parte rovinato delle case et a parte sprofondatole con grande occisione di molte persone.

The seventh letter was sent from Naples on 8 December 1456 by the Florentine merchant Paolo Rucellai to his brother Giovanni: "Benevento is completely destroyed, and 400 people have been killed there".

Benevento tutto disfatto e mortovi delle persone 400.

The eighth letter was sent from Naples on 8-9 December 1456 by the Catalan ambassador in Naples, Pere Boquet, to the councillors of the city of Barcelona: "At Benevento and round about, many buildings have been badly damaged and many people killed".

A Benavent, e entorn Benavent, s'an derocats molts edificis e morta molta gent.

The ninth letter was sent from Naples on 9 December 1456 by ambassador Pere Dusany to the Catalan deputies: "Benevento [...] has been badly damaged: they say that a thousand people have been killed there".

Benavent [...] ha pres gran dan: dien hi ha mortes mil persones.

The tenth letter was sent from Naples on 11 December 1456 by the Venetian ambassador, Bertuccio Contarini, to doge Francesco Foscari: "At Benevento, the castle and a large part of the town have completely collapsed, and a very large number of people have been killed there".

Benivento el castello cum gran parte de la terra [tuto per terra], morte persone assaissime.

The eleventh letter was sent from Foggia on 12 December 1456, and was written by the Mantuan ambassador, to marquis Luigi III Gonzaga. The writer was on his way from Naples to Foggia and happened to be at Benevento when the earthquake struck the town: "And the earthquake was so powerful that it destroyed altogether more than 50 houses in the city, killing many of the people who lived in them. It destroyed two areas, one of which was in the castle, and it shook the other, together with the whole of the castle interior, so badly that it could scarcely have done worse if it had destroyed the whole of the exterior. Many houses were completely reduced to ruins, and those churches and houses which were not destroyed, were so badly damaged that no-one dares live in them. And amongst the other things I have to report to your lordship is that the hostelry where I was staying was reduced to ruins [...] and my room was so near to total destruction and so many stones and tiles came down, that I survived more by a miracle and by the grace of God than for any other reason".

et fu di tanta fortia che ruinò in quella città del tutto più de 50 case, con interito de molte persone che habitavano in quella. Ruinò de doe terre, una che era nel castello et l'altra con tutte le parte interiore di esso castello quassò, che esundete per forma che de haverlo tutto ruinato in fora poco pegio haveria potuto fare. Molte case del tutto riunono, et quelle che non ruinarono, chiese e case, sono rimaste così ruinose che 'l non è persona a chi basti lo animo ad habitarli. Et intra le altre adviso la Signoria Vostra che la

hostaria in la qual io alloggiava ruinò [...], et la mia camera foè così proxima alla total ruina, et tante prede e copi li caschareno, che io più miracolosamente et per gratia de Dio scampai che altramente.

The twelfth letter was sent from Naples on 14 December 1456 by the Florentine merchant Paolo Rucellai to his brother Giovanni: "They say that 800 souls have died at Benevento".

A Benevento si ragiona che sieno morti 800 anime.

The first report is attached to the letter of 22 December 1456 sent from Naples by the Milanese ambassador Antonio da Trezzo to duke Francesco Sforza: "At Benevento about 500 houses have collapsed, and about 400 people have died".

in Benivento son cadute circha 500 case et morte circha persone 400.

The thirteenth letter probably dates to January 1457, but the sender and recipient are unknown: "Most of the city of Benevento has collapsed, and about two hundred houses are in ruins".

La città di Benevento, caduta nella maggior parte e diroccate circa duecento case.

The second report of unknown authorship, probably dates to January 1457, was sent to cardinal Prospero Colonna: "Benevento has suffered massive damage, and a very large number of people have been killed".

Benivento grandissima ruina, e assai numero de homini morti.

The author of the third report written in Naples, very probably in February 1457, was Goro di Giovanni, a Florentine citizen: "The city of Benevento [...]; all these towns and castles were badly damaged in these earthquakes, as were also the churches and chapels in them, and many *palazzi* and towers".

la città di Benivento [...]; tutte queste città e chastella furono per i detti tremuoti malamente perchose, e simile le chiese e oratori che dentro vi sono, e molti de li palagi e torri.

According to Manetti: "And so we have seen that the above-mentioned city of Benevento, which was both beautiful and ancient, has been so totally and disastrously damaged that, as far as we have been able to assess, more than half of it has been destroyed, and it mourns the death of about four hundred people who, it appears, were buried in the ruins at that time".

Itaque commemoratum Beneventum, pulchram simul ac vetustam urbem, tanta tamque magna ruinarum damna passam fuisse vidimus, ut plusquam semirutum, cum quadringentarum circiter personarum, quas eodem temporis momento simul obritas fuisse constat, internitione conspexerimus.

According to the chronicle of Pierozzi: "The noble city of Benevento (whose metropolitan is a very worthy person) has been largely destroyed, including the cathedral, where the body of St. Bartholomew is supposed to lie. 350 people have perished in the ruins".

Beneventana civitas notabilis (ubi metropolitanatus est dignissimus) pro maiori parte destructa est et ecclesia cathedralis, ubi dicitur corpus apostoli Bartholomei quiescere, deficientibus inde hominibus CCCL ex ruinis.

There is also a papal brief issued on 3 September 1459 at Mantua, again by pope Pius II, aimed at providing alms for the church of S. Bartolomeo Apostolo in Benevento, which had been reduced to ruins in the earthquake, by granting plenary indulgence to benefactors. The text has been transcribed by the historian Giovanni De Nicastro (1654-1738) in his ecclesiastical history of Benevento, published in 1976 (pp.121-2):

"it is our wish that the said church [of S. Bartolomeo Apostolo at Benevento] in which the illustrious body of Bartholomew himself is said to lie, should receive suitable honours and therefore that its structures and buildings should be renovated, with the help of the pious alms of the faithful, for most of it seems to have been badly damaged in the earthquake, [...]. Issued at Mantua in the year of the Incarnation of Our Lord 1459, on the third day before the Nones of September [3 September] in the second year of our pontificate. Pope Pius II".

nos cupientes, ut Ecclesia ipsa, in qua ipsius Bartholomoei gloriosissimum Corpus requiescere dicitur, congruis honoribus frequentetur, ac in structuris, et aedificis, quae ob Terremotum, ut plurimum conquassata existit, per pias eorundem fidelium aelemosinas restauretur [...] Datum Mantuae. Anno Incarnationis Dominicae 1459. Tertio Nonas Septembris Pontificatus nostri Anno Secundo. Pius Papa Secundus.

In a bull issued at Mantua on 5 September 1459, pope Pius II confirmed all the ancient privileges which the city enjoyed, released its inhabitants from any oath of loyalty to any king or secular lord, and provided by law for the sound administration of justice, the good conduct of public affairs, and the rebuilding of the city walls, which had been "shaken in the earthquake and partly reduced to ruins" (*ob terremotum conquassata, et partim in terra collapsa*). There is a summary of the bull in Borgia (1763-69, III, p.394), but only the brief passage set out above is transcribed.

Earthquake effects at Benevento are also recorded in the following chronicles: the *Annales de Raimo*, the *Diurnali* known as "of the duke of Monteleone", the French chronicle of Jean Chartier, the *Notabilia temporum* of Angelo Tummolillo, the *Cronaca di Viterbo* of Nicola della Tuccia, the chronicle of Giovanni di mastro Pedrino of Forlì, the *Dietari* of Melchior Miralles, and the annals of Matteo Palmieri.

Castelnuovo (province of L'Aquila)

A large proportion of its houses collapsed. The source is a report of unknown authorship, probably dates to January 1457, was sent to cardinal Prospero Colonna: "Castelnuovo in the *contado* of L'Aquila has been reduced to ruins".

Castello Nuovo nel contado de L'Aquila è sufundato.

Dugenta (province of Benevento)

A large proportion of its houses collapsed. The sources are a letter dating to December 1456, Manetti's treatise, two contemporary chronicles and Astesano's poem. The letter was sent from Naples on 7 December 1456 by the Sienese ambassador, Bindo Bindo, to the authorities of the Sienese Republic: "At Dugenta, which was a town of more than 200 hearths, everything is in ruins, and all that remains is a fragment, namely one man and an old woman".

Ad Ducenta, che era terra de più de 200 fochi, tutto ruynato, non gli è remasto se non lembo, cioè uno homo et una donicella vechia.

According to Manetti: "Dugenta, which suffered as much damage as Pontelandolfo, mentioned above [it was more than half destroyed], is prostrated with grief".

Ducentum paria cum superiori Landulfo damna perpessum dolet ac languescit.

According to the chronicle of Pierozzi, Dugenta (*Duconta*) was one of the places which "suffered appreciable harm in these earthquakes [...] they were not very badly damaged, and we are not told the number of victims".

notabile detrimentum receperunt ex ipsis terremotibus [...] non tantam ruinam passe sunt, numerus defunctorum non habetur descriptus.

Earthquake effects at Dugenta are also recorded in the chronicle of Mathieu d'Escouchy.

Fragneto l'Abate (province of Benevento)

It suffered substantial damage. In Pierozzi's chronicle, Fragneto l'Abate (*Labatina*) is included amongst places which "suffered considerable damage in the earthquakes [...] Of the villages listed which did not suffer serious damage, we do not have the number of victims".

notabile detrimentum receperunt ex ipsis terremotibus. [...] Non tantam ruinam passe sunt, numerus defunctorum non habetur descriptus.

Melfi (province of Potenza)

The castle collapsed, as well as part of the settlement. There were no victims. The sources are Manetti's treatise and Pierozzi's chronicle. According to Manetti: "Melfi bewailed the loss of its castle and part of the inhabited area, but none of the inhabitants was killed.

Melfium arcem ac partem opidi sino aliquo incolarum desiderio concidisse cognovit.

In Pierozzi's chronicle, Melfi (*Melsia*) is included amongst localities which "have been largely destroyed" (*in magna parte destructis*).

Navelli (province of L'Aquila)

Suffered substantial and widespread collapses. The source is a report of unknown authorship, probably dates to January 1457, sent to cardinal Prospero Colonna: "Navelli dell'Aquila has likewise [collapsed in ruins].

Naveli de Aquila simelmente [è sufundato].

Popoli (province of Pescara)

It suffered serious damage. The source is the letter written to duke Francesco Sforza by the Milanese ambassador, Antonio da Trezzo, and sent from Naples on 6 December 1456:

"At Popoli [...] [the earthquake] has caused similar serious damage".

A Popoli [...] [il terremoto] ha fatto analogamente grande danno.

Sant'Agata de' Goti (province of Benevento)

Many houses collapsed. The source is a report of unknown authorship, probably dating to January 1457, and sent to cardinal Prospero Colonna: "Sant'Agata is in ruins".

Santa Agatha sufundata.

Somma Vesuviana (province of Naples)

A number of houses collapsed. The source is a letter sent from Naples on 8 December 1456 by Giannozzo Manetti to his brother Filippo: "What follows is an account of the castles and villages which have been struck by this scourge: at Acerra, the town walls and a number of houses have collapsed [...] at Somma [Vesuviana] the same thing happened to a number of hamlets".

Quello che seguirà sarà il singnifichato delle chastella e delle terre che questo fragello à percosse: la Cerra colle mura e con più case in terra; [...] di Sonma il simile di più chasali.

Venafro (province of Isernia)

Many houses collapsed. The sources are three letters written in December 1456 and January 1457. The first letter sent from Naples on 6 December 1456 was written to duke Francesco Sforza by the Milanese ambassador, Antonio da Trezzo: "At [...] Venafro [...] and many other towns and castles (the earthquake) has caused equally serious damage".

Ad [...] Benafrio [...] et in molt'altre cità et castelle è simelmente facto grande danno.

The second letter, sent from Foggia on 12 December 1456, was written to marquis Luigi III Gonzaga by the Mantuan ambassador: "It is said [...] that Venafro is partly in ruins" (*se dice [...] che Vanasio è in parto ruinato*). The sender and recipient of the third letter, probably dating to January 1457, are unknown: "The town of Venafro. Two parts of the town are in ruins".

La città di Venafro. Due parti della città guaste.

Accadia (province of Foggia)

A large proportion of its buildings collapsed. Accadia was a village of 50 hearths (estimated population: 250), and there were 50 victims (20%). The sources are Manetti's treatise and the chronicle of Pierozzi. According to Manetti: "Accadia collapsed in ruins, crushing about fifty people to death".

Achadium ad solum eversum quinquaginta circiter personas obtrivit.

According to the chronicle of Pierozzi: "Accadia, near Monte Leone, was razed to the ground, causing many deaths, but their number has not been counted".

Achadia prope montem Leonem ad terram deiecta, multis mortuis non numeratis.

Acerra (province of Naples)

Some buildings collapsed, as well as part of the city walls. The sources are two letters of December 1456, a report dating to January 1457, Manetti's treatise, and Astesano's poem. The first letter sent from Naples on 7 December 1456 was written by the Sienese ambassador, Bindo Bindi, to the authorities of the Sienese Republic: "At la Cora [Acerra] [...] the earthquake has caused very serious damage, and more than half the village walls have collapsed".

Ad la Cora [...] facto grandissima ruyna; et più che la mità dele mure dela terra cascate.

The second letter sent from Naples on 8 December 1456 was written by Giannozzo Manetti to his brother Filippo: "What follows is an account of the castles and villages which have been struck by this scourge: Acerra has its walls and a number of houses in ruins".

Quello che seguirà sarà il singnifichato delle chastella e delle terre che questo fragello à percosse: la Cerra colle mura e con più case in terra.

The report of unknown authorship, probably dates to January 1457, was sent to cardinal Prospero Colonna: Acerra (*la Cerra*) is included in a list of places struck by the earthquake, but for which the writer does not specify the effects. According to Manetti's treatise: "Acerra [...] suffered not only the collapse of houses and private walls, but also the partial destruction of the village walls".

Aerre [...] non solum domos privatosque parietes, sed menia quoque semiruta conspexerunt.

Alberona (province of Foggia)

For Alberona, the sources provide divergent accounts. According to Manetti, there was limited damage, whereas Pierozzi tells us that it was largely destroyed. Alberona was a village of 67 hearths (estimated population: 335), and there were 2 victims (0.5%). According to Manetti's treatise: "Alberona did suffer some damage, but it was so slight that it can be disregarded and passed over in silence, except that two people were crushed to death".

Alveronium sensit quidem damna, sed ita pauca fuere, ut pro nullis nisi de duobus tantum modo obtritis habeantur, ac silentio pretermittantur.

In Pierozzi's chronicle, Alberona (*Lucrona*) is included amongst places which were "largely destroyed" (*in magna parte destructis*).

Alvito (province of Frosinone)

Some houses collapsed but others remained standing. Alvito was a town of 459 hearths (estimated population: 2,295), and there were about 40 victims (1.7%). The sources are Manetti's treatise, Pierozzi's chronicle and a *Notula* in the margin of the codex 47 in the Archivio dell'Abbazia of Montecassino. According to Manetti: "Part of the very ancient town of Alvito collapsed and part survived, and about forty people were killed".

Alvitum, vetustum sane opidum, partim lapsum, partim vero conservatum, quadraginta circiter personas delevit.

According to Pierozzi: "Part of Alvito has been destroyed, and 36 people have perished".

Alvitu in parte destructa XXXVI extinti sunt.

The *Notula*: "In truth, Gaeta [...], Alvito, and in Abruzzo, castles, churches and villages suffered extraordinary damage, for at various villages or castles only a single house remained standing, while at others four survived and at others ten, and in a few places, castles were submerged in raging waters".

Verum Gajete [...] Albeto, et in Aprutio castra, ecclesie, ville, mirabiliter ruerunt, sic ut in quibusdam locis vel castris sola domus remansit, alibi quatuor domus, ubi vero decem nec non et alibi aquis rapientibus castra submersa extiterunt.

Arienzo (province of Caserta)

There was serious damage, but only the fortress collapsed. The sources are a letter and a report dating to December 1456 and January 1457. The letter sent from Foggia on 12 December 1456 was written to marquis Luigi III Gonzaga by the Mantuan ambassador: "Aragusa [Arienzo] was very badly shaken, but only the fortress was destroyed. It was a tall building and is completely in ruins".

ad Aragusa ha quassato assai la terra, senza haver ruinato excepto la forteza, che era alta, che è in tutto ruinata.

The report of unknown authorship, probably dates to January 1457, was sent to cardinal Prospero Colonna: *Arienzo* is included in a list of places struck by the earthquake, but for which the writer does not specify the effects.

Arpaia (province of Benevento)

Half destroyed. The fortress was badly damaged, as well as many houses and the church of S.Francesco. There were no victims. The sources are two letters of December 1456, a report dating to January 1457, Manetti's treatise, two contemporary chronicles and Astesano's poem. The first letter sent from Naples on 7 December 1456 was written by the Sieneese ambassador, Bindo Bindi, to the authorities of the Sieneese Republic: "At Arpaia, the fortress which stood on the hill has collapsed, and the church of S.Francesco has likewise collapsed".

Ad Arpino, ruynata la rocha che era sul monte; similiter la chiesa de Sancto Francisco.

The second letter sent from Foggia on 12 December 1456 to marquis Luigi III Gonzaga was written by the Mantuan ambassador: "The castle of Arpaia has likewise collapsed [...] and in the village the church and many houses are in ruins".

Similiter è ruinato lo castello d'Arpaio [...] e ne la terra è ruinata la chiesa con molte case.

The report of unknown authorship, probably dates to January 1457, was sent to cardinal Prospero Colonna: Arpaia (*castel de Arpaia*) is included in a list of place struck by the earthquake but for which the writer does not specify the effects. According to Manetti: "The violence of these earthquakes struck and shook the town of Arpaia (or rather, Arpino) [...] as well that it seemed half destroyed to all those who saw it".

Opidum etiam nomine Arpaium, vel potius Arpinum [...], ita vehementia horum terremotuum concussit quassavitque, ut semirutum cunctis conspensoribus videatur.

According to the chronicle of Pierozi: "The castle of Arpaia has completely collapsed in ruins, but there are no victims".

Castellum Arpaie in totum decidit, nullo tamen mortuo.

Arpaia is recorded in the French chronicle of Mathieu d'Escouchy as reduced to ruins.

Ascoli Satriano (province of Foggia)

The castle and a large part of the inhabited area collapsed. There were no victims. The sources are five letters dating to December 1456, a report dating to January 1457, Manetti's treatise, four contemporary chronicles and Astesano's poem. The first letter sent from Foggia on 7 December 1456 was written by Ercole d'Este to his brother Borsò: "Ascoli [...] and many other places are in a similar state part has collapsed".

Asquili [...] et molte altre terre pur il simile [parte dela terra per terra].

The second letter sent from Naples on 11 December 1456 was written to doge Francesco Foscari by Bertuccio Contarini, ambassador of Venice: "Ascoli di Puglia is completely in ruins".

Aschole di Puia tuta in terra.

The third letter sent from Foggia on 12 December 1456 to marquis Luigi III Gonzaga was from the Mantuan ambassador: "Ascoli di Puglia has largely collapsed".

Asoli di Puglia caduto in gran parte.

The fourth letter sent from Naples on 14 December 1456 was written by the Florentine merchant Paolo Rucellai to his brother Giovanni: "Ascoli di Puglia and Troia have suffered a great deal because of what has collapsed and the people who have been killed".

Ascoli di Puglia et Troia, ricevuto danno assai di cose chaschate e di gente morta.

The sender and recipient of the fifth letter, probably dating to January 1457, are unknown: "The town of [...] Ascoli in Puglia and the locality have had a severe earthquake: many houses have collapsed and there have been many victims; but no town has been completely destroyed".

La città di [...] Ascoli in Puglia, e il paese hanno sofferto gran terremoto, e sono cadute molte case, e molta gente è rimasta morta; ma nessuna città è sprofondata.

The report of unknown authorship, probably dates to January 1457, was sent to cardinal Prospero Colonna: "Alife [...], Ascoli di Puglia [...] some have been completely and some partly destroyed".

Aliphe [...], Ascoli de Puglia [...], chi in abisso e chi ruinato in gran parte.

Manetti records: "Ascoli Satriano lost its fortress and a large part of the urban area but, amazingly, there were no victims".

Ascola arcem et magnam quoque opidi partem absque ullis funeribus mirabile dictu per ruinam amisit.

According to the chronicle of Pierozzi: "Ascoli has been destroyed to no small extent, and its fortress too, but no-one was killed".

Esculium destructum in parte non modica, et fortalitiu ejus, sine morte tamen alicuius.

Ascoli is recorded in the following chronicles as one of the places which suffered massive destruction: the *Diurnali* known as "of the duke of Monteleone", and the French chronicles of Jean Chartier and Mathieu d'Escouchy.

Atella (province of Potenza)

About half its buildings collapsed. Atella was a town of 798 hearths (estimated population: 3,990), there were 15 victims (0.3%). The sources are Manetti's treatise and Pierozzi's chronicle. According to Manetti: "Atella (not the very ancient town, of which nothing apparently remains in our day, but another) was half destroyed and mourned the death of fifteen people".

Attella, non illa urbs vetustissima cuius nulla temporibus nostris vestigia extare videntur, sed altera, semiruta quindecim homines desideravit.

In Pierozzi's chronicle, Atella (*Tella*) is included amongst places which were "largely destroyed" (*in magna parte destructis*).

Aversa (province of Caserta)

Many houses collapsed, as well as part of the castle, the church of S.Paolo and its bell-tower. Aversa was a town of 1,626 hearths (estimated population: 8,130), and there were about 12 victims. The sources are seven letters written in December 1456, two report dating to January and February 1457, Manetti's treatise and four contemporary chronicles. The first letter sent from Naples on 6 December 1456 was written to duke Francesco Sforza by the Milanese ambassador, Antonio da Trezzo: "At [...] Aversa [...] and many other towns and castles, the earthquake also did serious damage".

Ad [...] Aversa [...] et in molte altre città et castelle è simelmente facto grande danno.

The second letter sent from Naples on 8 December 1456 was written by Giannozzo Manetti to his brother Filippo: "At Aversa [...] the earthquake has done a great deal of damage".

Ad Averssa [...] à fatti danni assai.

The third letter sent from Naples on 8 December 1456 was written by Giannozzo Manetti to the Florentine *Signoria*: Aversa is included amongst those places where the earthquake "has done a certain amount of damage, depending on the nature of the sites and the quality of the buildings; and a huge number of inhabitants have fled".

à fatti varii danni, secondo la varietà de' siti e lla qualità d'edificii, e grande e innistimabile 'vasione degli abitanti.

The fourth letter sent from Naples on 8 December 1456 was written by Giannozzo Manetti to Vespasiano da Bisticci: Aversa is included amongst the places where the earthquake "has struck to a greater or lesser extent, causing varying amounts of damage according to the vulnerability and position of the places concerned, for in some of the above-mentioned villages it seriously damaged their walls, in others it demolished houses, and yet others collapsed into the ground, thereby killing many people".

ha percosso variamente, et facto varij danni secondo la debolezza et sito de' luoghi, peroché a parte delle terre predecite ha frachassate le mura, a parte rovinato delle case et a parte sprofondatole con grande occisione di molte persone.

The fifth letter sent from Naples on 8 December 1456 was written by the Florentine

merchant Paolo Rucellai to his brother Giovanni: "At Aversa the castle is in ruins, as well as the church of S. Paolo and the bell-tower and many other things".

Aversa caduto il chastello e lla chiesa di San Paolo e il chanpanile e più altre chose.

The sixth letter sent from Foggia on 12 December 1456 to marquis Luigi III Gonzaga was written by the Mantuan ambassador: "At Aversa part of the castle is in ruins, as well as many houses across the town, but there have been few victims.

ad Aversa è ruinato parte del castello e molte case per la città, ma pochi huomini li sono morti.

The sender and recipient of the seventh letter, probably dating to January 1457, are unknown: "The town of Aversa. About 400 houses have been completely destroyed, and people have been killed".

La città d'Aversa. Circa 400 case, tutte distrutte, e le persone rimasero morte.

The first report of unknown authorship, probably dates to January 1457, was sent to cardinal Prospero Colonna: "Alife [...], Aversa [...], some have been destroyed and others are largely in ruins".

Aliphe [...], Aversa [...], chi in abisso e chi ruinato in gran parte.

The second report was very probably written at Naples on February 1457, and is by Goro di Giovanni, a Florentine citizen: "The town of Anversa [...]; all these towns and castles were badly affected by these earthquakes, and so were the churches and chapels inside them and many of the *palazzi* and towers.

la città d'Anversa [...]; tutte queste città e chastella furono per i detti tremuoti malamente perchose, e simile le chiese e oratori che dentro vi sono, e molti de li palagi e torri.

According to Manetti: "The new town of Aversa, which stands where Attalla once stood [...], was so badly affected that not only did a number of houses collapse, but about twelve people were killed".

Adversa, nova urbs ubi olim Attella fuit civitas [...], plurimarum domorum ruinam ita perpessa est, ut non sine duodecim circiter personarum internitione remanserit.

Pierozzi records: "In the town of Aversa, which is about 8 miles away in the Rome direction, many dwellings have been destroyed and its forts have been badly damaged. The number of victims is still not known.

In civitate Aversana, que ab ea distat per octo miliaria versus Romam, habitationes multe destructe et fortalitium eius magnam quassationem recepit, numerus morientium ex eo adhuc incognitus.

Aversa is recorded in the following chronicles as one of the places which suffered collapses: the *Gesta achiepiscoporum magdeburgensium*, the French chronicle of Jean Chartier, the *Notabilia temporum* of Angelo Tummolillo, the *Dietari* of Melchior Miralles, and the *Liber de vita Christi* of Bartolomeo Sacchi, known as Platina.

Bovino (province of Foggia)

Seriously damaged, with some buildings collapsing. Bovino was a town of 300 hearths (estimated population: 1,500), and there were 10 victims (0.6%). The sources are a report of 22 December 1456, Manetti's treatise and Pierozzi's chronicle. The report is attached to the letter of 22 December 1456 sent from Naples by the Milanese ambassador Antonio da Trezzo to duke Francesco Sforza: "At Biccari as at Bovino, there has been a great deal of damage".

A Bicchari simelmente et a Bovino ha facto grandissimo danno.

According to Manetti: "It reduced part of Bovino to ruins and slightly damaged part, killing ten inhabitants".

Bovinum partim conquassatum, partim vero levia damna perpessum, decem homines interfecit.

In Pierozzi's chronicle, Bovino (*Buinum*) is included amongst places which were "largely destroyed" (*in magna parte destructis*).

Castelluccio Valmaggiore (province of Foggia)

The cathedral and a large number of houses collapsed. Castelluccio Valmaggiore was a town of 165 hearths (estimated population: 825), and there were 6 victims (0.7%). The source is Manetti's treatise: "Castelluccio was half reduced to ruins. Its cathedral collapsed, but only six people were killed".

Castellucium semirutum cathedralem basilicam suam collapsam cum sex tantummodo mortuis recognovit.

Civitanova del Sannio (province of Isernia)

There were some collapses and some buildings were badly damaged, while others suffered only slight damage. Civitanova del Sannio was a village of 67 hearths (estimated population: 335), and there were 3 victims (0.8%). The sources are Manetti's treatise and Pierozzi's chronicle. According to Manetti: "Civitanova was partly reduced to ruins and partly damaged only slightly, and there were only three victims.

Civitas cognomento Nova, partim vastata, partim parumper lesa, tres duntaxat personas occidit.

In Pierozzi's chronicle, Civitanova (*Civitas nova*) is included amongst places which "have been completely laid waste by these earthquakes. In some cases there were victims, though perhaps not many, and in others I have not seen any number mentioned".

in totum desolate sunt ex dictis terremotibus. Et in aliquibus earum mortui sunt aliqui licet pauci, de aliis non vidi numerum designatum.

Fondi (province of Latina)

Most of the fortress was damaged. The sources are a letter and a report dating to December 1456 and January 1457, and Astesano's poem. The letter sent from Naples on 14 December 1456 was written by the Florentine merchant Paolo Rucellai to his brother Giovanni: "This disaster even reached L'Aquila by way of Abruzzo, and in Apulia it reached Trani and Barletta, and it spread from Rome to Fondi".

Questo accidente è stato per insino all'Aquila per la via d'Abruzzi, e in Puglia insino a Trani e Barletta, e di verso Roma fino a Fondi.

The report of unknown authorship, probably dates to January 1457, was sent to cardinal Prospero Colonna: "At Fondi most of the fortress has been damaged".

Funda guasta la rocha in maior parte.

Francolise (province of Caserta)

There was quite a lot of damage. The source is the letter sent from Naples on 8 December 1456 by the Florentine merchant Paolo Rucellai to his brother Giovanni: "At la Torre and Francolise the earthquake has done a great deal of damage".

la Torre e Francolise fatto danno assai.

La Torre and Francolise were not two separate places but a single locality known as Torre di Francolise at the time of the earthquake.

Lucera (province of Foggia)

The castle and the church of S.Domenico collapsed, as well as about three hundred houses. There were no victims. The sources are two letters and two reports dating to December 1456 and January 1457, Manetti's treatise, Pierozzi's chronicle and Astesano's poem. The first letter sent from Foggia on 7 December 1456 was written by Ercole d'Este to his brother Borso: "Nocera [Lucera] di Puglia lies half in ruins".

Nucera de Puglia la medietate per terra.

The second letter sent from Foggia on 12 December 1456 to marquis Luigi III Gonzaga was written by the Mantuan ambassador; "the earthquake has caused serious damage at Nocera [Lucera], and most of the old fortress — a strong building — has collapsed, as well as the church of S.Domenico; but the rest of the houses in the town have survived, though they have been so badly shaken that they seem about to collapse at any moment".

Ha butato grando danno in la Nocera, e per mazor parte è ruinato el castello antiquo, forte edificio, et la chiesa de Sancto Dominico; ma il resto delle case della città sono rimaste, e così quassate che pare ogni hora dover cadere.

The first report is attached to the letter of 22 December 1456 sent from Naples by the Milanese ambassador Antonio da Trezzo to duke Francesco Sforza: "At Nocera [Lucera], the castle has collapsed, as well as a large part of the town walls and the buildings inside, and many people have been killed".

A Nocera caschato el castello, una grande parte del muro dela città et casamento dentro et morte molte gente.

The second report of unknown authorship, probably dates to January 1457, was sent to cardinal Prospero Colonna: "Alife [...], Nocera [Lucera] [...] some have been destroyed and others are largely in ruins".

Aliphe [...], Nocera [...] chi in abisso e chi ruinato in gran parte.

According to Manetti: "The fortress at Lucera, or Nocera [...] completely collapsed, and about three hundred houses in the town also collapsed; and yet in spite of this serious and widespread disaster, no-one was killed (you would scarcely believe it, but it is absolutely true)".

Nam Lucerie vel Nucerie [...] arx tota funditus ruit, et trecente circiter opidi domus ceciderunt, et tamen nemo in tanta et tam ingenti ruina, quis credere posset, quanquam verissimus sit, extinctus est.

Pierozzi records: "In the regions of Capitanata and Apulia, the castle or fortress of Nocera has collapsed, and 300 houses are in ruins, but the number of victims is not known".

In regione autem Capitanate et Apuliae, Nucerie cecidit arx seu fortalitium et domorum civitatis numerus trecentenarius ruentium; numerus autem inde defunctorum ignotus.

Naples

The city suffered massive and extensive damage, involving the total collapse of about 60 houses and *palazzi*. More than 400 dwellings either partially collapsed or were so badly damaged as to become uninhabitable; and there were altogether about 100 victims. Thanks to the very large number of sources, we have a detailed knowledge of effects on many secular and church buildings in the city and its immediate surroundings.

Secular buildings:

- Castel Capuano: so badly damaged that it became uninhabitable.
- Castel S.Elmo: its towers collapsed, and large cracks appeared in its walls. Part of

the building collapsed, and the rest was badly damaged. Eight people were killed, and a number badly injured.

- Castel Nuovo (Maschio Angioino): five merlons fell from one of its towers. There was slight damage inside, and the church was damaged.
- *Palazzo* of the *capitano* of the city: completely collapsed and a number of people were killed.
- *Palazzo* of Leonello Ciciniello: this fairly new building completely collapsed, killing several people.
- *Palazzo* of Sanseverino (now the late 16th century church of Gesù Nuovo): badly damaged.

Churches:

- S. Agostino della Zecca: the naves collapsed, the choir was damaged, and the rest of the building was so badly damaged that it could no longer be used.
- S. Arpino: most of it was badly damaged. Half the bell-tower collapsed and the rest was damaged.
- S. Chiara (church and monastery): very seriously damaged; part of the cloister ceiling collapsed.
- S. Domenico: badly damaged, especially the roof and upper part of the façade.
- S. Eligio: the bell-tower collapsed.
- S. Giorgio: badly damaged.
- S. Giovanni Maggiore: one of the worst affected buildings. It almost completely collapsed: only the tribune of the high altar remained standing.
- S. Lorenzo (church and convent): the church was damaged, the convent dormitory and living quarters partly collapsed and partly suffered serious damage.
- S. Maria del Carmine: severely damaged.
- S. Maria Incoronata: damaged.
- S. Maria Maggiore: one of the worst affected buildings: it completely collapsed.
- S. Maria la Nova: seriously damaged.
- S. Martino (church and Carthusian monastery): the monks' cells and the cloister ceilings were badly damaged; and the ceilings and walls of the church were also damaged.
- Monteoliveto (church and monastery): part of the monastery roof collapsed; the ceilings and walls of the church were damaged.
- S. Pietro a Maiella: damaged.
- S. Pietro Martire: the roof collapsed; many parts of the building were damaged, and the bell-tower collapsed.
- Ss. Severino e Sossio: severely damaged.
- Church of the Vescovado (bishop's *palazzo*): the roof, bell-tower and part of the walls collapsed, killing five priests. Two towers opposite the building were badly damaged.

Naples is the city for which we have the most detailed descriptions of earthquake effects. The sources are: 18 letters and two reports, written between 6 December 1456 and 31 March 1457, a document in a register of accounting records, three *Notulae* in the margins of codices, 19 contemporary chronicles and Astesano's poem. Of this large number of sources, we set out below the text of the most significant, including, in particular, the letters which dwell on the effects on city buildings.

A letter was sent from Naples on 6 December 1456 to duke Francesco Sforza by the Milanese ambassador, Antonio da Trezzo: "At about the second hour, last Saturday night [4 December], as Sunday [5 December] approached, there was the most powerful earthquake that anyone can recall having heard or seen. It lasted as long as it takes to recite the *In principio erat verbum* one and a half times. A very great number of houses throughout this city [Naples] have been reduced to ruins, and the ruins are such as to have blocked many streets and made them impassable. And there are very few houses, if any, which are not either partly in ruins or with their walls split open. They

found about a hundred people were killed [...]. The tower of Castel S.Elmo collapsed and the walls split open, and eight people were killed there. The dwellings at Castel Capuano are so badly damaged that they are uninhabitable; and the duchess with her children and family fled from there, and have no intention of ever returning; and her ladyship told me that the danger was so serious that she fears some people may have been killed: someone will be sent to collect her belongings. Today I accompanied her ladyship to see the house at S.Maria Incoronata, where her ladyship intended to take up residence, but we found that the walls and ceilings were all split open and in danger of collapse, so we left at once without pausing. The church of S.Giovanni Maggiore is completely in ruins, and so is a large part of the archbishop's palace: S.Domenico has been so badly damaged that it will take more than 10,000 ducats to repair it. S.Agostino, S.Lorenzo, S.Pietro Martire, S.Chiera, S.Severino and many other churches have been very badly damaged. And the city is in such a state of fear that most people have taken to lodging outside in the open [...]; and those who have stayed in the city have not dared to go to bed".

Sabbato passato de nocte circa le dece hore venendo la domenica fo qua el maggiore terremoto che mai persona se ricorda havere audito né veduto, el quale durò per tanto spatio de hora quanto se dicesse una volta et meza lo "In principio erat verbum". Sonno ruynate molte et molte case per tuta questa città et in talle modo ruynate che hanno chiuse molte vie per le quale non se pò passare, et niuna o bene poche case sonno che non siano in parte ruynate o le mura aperte. Se trovano morte circa cento persone [...]. La torre de Castello Sancto Heremo è caduta et apertose le mura et morti persone octo. Li casamenti de Castel Capuano sonno guasti per forma che non se pò abitare, fora del quale a furia se partete quella nocte la illustrissima madama duchessa cum li figlioli et tuta la famiglia, per modo che non intende più ritornarli, et me ha dicto la signoria sua che così pericolosamente stanno le case che dubita perirano qualche persone se mandarà a cavare la roba sua. Hogi andai cum la signoria sua per vedere la casa de la Incoronata, ne la quale sua signoria se voleva redure ad habitare, et havemo trovato che ha le mura et le volte tute aperte et minaciare ruyna in modo che senza fermarsi ritornassemo fora bene presto. La chiesa di San Zohanne Maiore è in tuto ruynata et così una grande parte de lo arcivescovato. Sancto Domenico ha havuto tanta ruyna et cum Xm [10,000] ducati non se aconciarà. Sancto Augustino, Sancto Lorenzo, Sancto Pedro martire, Sancta Clara, Sancto Severino et molt'altre chiesie hanno ricevuto grandissimo danno. Et è in tanto tremore questa città che la mazore parte sonno alogiate fuora alla foresta [...] e chi è stato in la città non s'è asecurato de metersi a lecto.

A letter was sent from Naples on 7 December 1456 by the Siense ambassador, Bindo Bindi, to the authorities of the Siense Republic: "My lords, on 4 of this month [December], after the 11th hour had struck, there was an earthquake, which lasted for a tenth of an hour or more, and it was so powerful that the whole of this city is in ruins, its churches being the worst affected. S.Agostino [...] can be described as a total ruin, because both naves collapsed from ceiling to foundations, and what is left is so split open and shaken that no-one dares go inside it, nor do the friars dare hold services. Similarly, at S.Pietro Martire, the whole roof has been destroyed, with the result that all the streets are impassable. Only the walls are left standing, and the experts say that they are bound to give way. It was a noble and beautiful church. S.Giovanni Maggiore is also completely in ruins; S.Lorenzo has almost completely collapsed; S.Maria Maggiore is entirely in ruins; S.Domenico is split open and shattered; and S.Severino lies all in ruins; and all these were large and beautiful churches. Much of the walls at S.Chiera, too, is in ruins [...], and the bell-tower of S.Eligio has collapsed. But the most amazing thing of all is the collapse of the bell-tower of S.Armino [...]. The same thing has happened to the bell-tower at the bishop's palace, where some priests

were killed. Many other parish churches have been so damaged and split wide open that it would take some time to describe all the details. Castel S. Elmo is also in ruins. Only five people survived there, and some of these have leg or head or other injuries. Innumerable *palazzi* and other large buildings are in ruins, with the result that you cannot pass by for the great quantity of collapsed masonry. The buildings which remain standing are all damaged and split open, and indeed there are very few which have not suffered partial collapse; and the most amazing thing is that a newly built *palazzo* belonging to Leonello, brother of Bofardo Ciciniello, is left without one stone standing upon another; and he [...] has been found dead with his lady and four slave women and the others who were in the building. The *palazzo* of the *capitano* of the city has also been destroyed, and a great many people were killed there, including wives and children. It was a noble and new building. A third of the crown of the first tower of Castel Nuovo has astoundingly collapsed. I have seen all these things with my own eyes. [...]. Oh, my lords, anyone who did not experience the loud screams, the weeping, and the great laments and shouting of the men, women and children, who came naked out of their houses at night, with their children on their shoulders to save them, and as yet without news of their dead brothers, sisters and brothers and sisters-in-law, would be quite unable to describe what happened in speech or writing. [...] The water in the wells and cisterns in Naples was so disturbed that it spilled out. [...] I, alas, with all my family, was so overcome with sleep and threatened by the waters, that I was obliged to return to my dwelling, since I had nowhere else to go. [...] Just think that of all the bells in this town there are only seven capable of ringing”.

Signori mei, a dì 4 de questo, sonate le XI hore, vene uno terremoto, el quale durò per spacio de unò decimo d'hora et forse più, et fo sì grande che tutta questa terra è ruynata, principalmente commenzando ali templi de Dio: Sancto Augustino [...] se pò dire tutta essere ruynata, perché tutte doe le navate delè volte funditus cascorono, et quello che è remasto è apperto et conquassato in forma che nissuno ardisse andarvi dentro, né frati ad celebrare. Similiter Sancto Petro Martire tutto lo tecto ruynato in forma che da niuno canto per le strate se pò andare, sono remaste solamente le mura, le quale secondo quelli che intendeno non possono durare: era una nobile et bella chiesa. Similiter Sancto Zohanne Mazore tutto ruynato. Similiter Sancto Lorenzo quasi tutto a terra. Similiter Sancta Maria Mazore tutta ruynata et similiter Sancto Domenico tutto aperto et fracassato. Similiter Sancto Severino tutto a terra; li quali templi erano grandi et belli. Similiter Sancta Chiara: in più parte de quelle miraglie fu grandissima ruyna [...]. Et ruynato el campanile de Sancto Alo [S. Eligio]; ma quello che più è da maravigliare la ruyna del campanile de Sancto Arpino [...]. Similiter lo campanile delo Episcopo, dove sono morti certi preti. Molte altre chiese parochiale tute aperte et commosse, dele quale longo saria scrivere particolarmente. Ruynato castello Sancto Heremo, dove non camparono se non cinque persone, de le quale chi ha rotto le gambe et chi la testa et chi è guasto. Ruynati funditus infiniti palazi et casamenti in forma che per le strate non se pò più andare, né passare per lo repieno dele mura; quelle che sono remaste in piede sono tutte aperte et commosse, et veramente pochissime ce ne sono che in qualche parte non siano cascate; et, che è più da meravigliarse, che uno palazo novamente edificato, el quale era de domino Leonello, fratello de domino Bofardo Ciciniello, non è remasta petra sopra petra, el quale [...] trovato morto con la donna sua cum quatro schiave et con chi era dentro. Similiter el palazo del capitaneo dela terra tutto ruynato, dove grandissima quantità de gente morì, et mogliere et figlioli, casamento nobile et novo. Cascato el terzo dela corona dela prima torre de Castelnuovo, che pare uno miraculo a dirlo; le quale tutte cose ho veduto con li ochii mei. [...] o signori mei, ch(i) havesse veduti li grandissimi stridi et lacrimabili pianti et grandi lamenti et vociferatione deli homini, donne et fanciuli, li quali ussivano la nocte fuora dele case nudi con loro figlioli in collo per campare la vita, non sappendo ancora de loro fratelli,

sorelle et cognati morti, saria impossibile cum penna scriverlo o con lingua nararlo. [...] L'aque de' pozi e de le cisterne sono in Napoli, era sì grande la tempesta gli era dentro, che spingeva l'aque de fuora. [...] io povereto che cum tutta la mia familia, vinto dal somno et dale aque, fo constrecto, non havendo receto, retornarmene al'albergo. [...] Considerate che de quante campane ha questa terra sono solo septe che possono sonare.

A letter was sent from Naples on 8 December 1456 by Giannozzo Manetti to his brother Filippo: "I can tell you that the castle of S.Elmo has been so badly shaken that you could say the whole of it is in ruins, since most of the towers have collapsed, and you cannot identify what is left because there is so little, and it is shattered and in ruins; and part of the inside of the building has collapsed and part has been badly damaged [...] and eight people were killed there, and the survivors were so badly injured that they are in a critical condition. Furthermore, the monastery building of the Carthusian monastery of S.Martino has suffered serious damage to the monks' cells and cloister ceilings; and in the body of the church the earthquake has produced cracks in both the walls and ceilings. When I entered the city, I gazed upon the destruction [...], and beginning with S.Maria la Nova, which is close to the city walls, I can tell you that the building is in danger of collapse, and its walls are cracked in various places; the same is true of S.Chiara, and in addition, part of the cloister ceiling has collapsed. The bell-tower of the church of S.Pietro has collapsed; the church of S.Domenico has been damaged; the church opposite S.Maria is in ruins; S.Lorenzo has been damaged; at S.Armino, the bell-tower and most of the church have collapsed; all I need say of S.Agostino is that one of the church naves has been badly damaged, and what remains of it is leaning at an angle; the bell-tower of S.Eligio, and at the fortress, a piece of the chimney wall on the city wall side has fallen down. [...]. Nor must I leave out S.Giovanni Maggiore, for I can tell you that it lies completely in ruins. I shall not go on to give you details about private buildings, but I can tell you that the earthquake has reduced many houses to ruins in many parts of the city, and many others are damaged at the corners, and many more are leaning at such an angle that one can truly say that the visible damage is incalculable and incapable of repair. And since this shock was sudden and occurred at night, there were many victims. More than one hundred people are thought to have been killed. [...] After that first great [earthquake] there were two more which were so small that they did no damage [...]. "Yesterday evening [7 December] at the 5th hour there was another [earthquake], but it was small".

dico che dal chastello di Sancto Ermo è stato fracaxato in modo che ssi può dire che ongni cosa vi sia rovinato, perché la maggiore parte delle torri sono cadute, e di quel che vi resta non si può fare conto, perché è poco e fracaxato et in ruina, e dentro tutto le edificio è parte chaschato e parte frachaxato [...] e 'nmorivi otto persone, e i campati sono romasi sì feriti che non sono senza pericolo di morte. Di poi lo edificio del manisterio di Ciertosa, che xi chiama Sancto Martino, à ricevuto danno axai colle maggiore parte delle cielle di que' monaci e nelle volte de' chiostri; e il corppo della chiesa à fatti più peli e nelle mura e nelle volte. Hora intrando nelle terre, riza l'ochio a questo fracaxo [...], e faciendo principio da Sancta Maria della Nuova, che è in sulle mura, dicho che il detto è pericolato, e lle mura in più luoghi pelate; di Sancta Chiara posso dire que'l medesimo, e ssogiungho che parte delle volte del chiostro sono chadute; il campanile della chiesa di Sancto Piero è ito in terra; la chiesa di Sancto Domenico à ricevuto danno; una chiesa che è dirinpetto a Sancta Maria è rovinata; Sancto Lorenzo à ricevuto danno; Sancto Arpino caschato il chanpanile colla maggiore parte della chiesa; di Sancto Agostino non ti dico altro se nonne che una dele navi della chiesa è fracaxata e il resto di quella nave è tutto inchlinato; il campanile di Sancto Lo e il forte chaschato uno pezo del muro del chamino dalla banda delle mura. [...] Di Sancto Giovanni Maiore, che io no voglio che rimanghi a drieto, ti posso dire che sia tutto per terra. Per non menare in più particularità di edifici privati, ti significo che gli à ruinate molte case in più luoghi

della terra, e molte altre n'è schantonate en molte altre inclinate, in modo che ssi può dire con verità ch'el danno fatto che ssi veda sia inistimabile e irreparabile. E perché q(ue)sto enpito fu subitanò e di notte, venne avere morti molta gente. Stimasi ch'el numero paxi ciento [...]. Dopo quel primo sì grande, ne venne due altri sì piccoli che non ànno fatto danno alchuno. [...] Jer sera alle .V. o ne vene un altro, ma piccolo.

A letter was sent from Naples on 8 December 1456 by Giannozzo Manetti to the Florentine Signoria: "The damage which the earthquake has done in and outside the city [Naples] is so great and extensive that it surely cannot be measured or repaired [...] I will make mention of the principal damage, starting with churches, for they are large buildings and so have suffered greater damage than palazzi and the homes of the laity. And in this part of the letter I have to say, in true and overall conclusion, that there is no church or monastery [...] which has not suffered terrible damage, and their roofs are almost entirely in ruins. And the following is intended to provide you with some relevant information: the church of the Carmine, S. Agostino and S. Francesco (which is divided into three monasteries, namely S. Chiara, S. Maria la Nova and S. Lorenzo); S. Pietro Martire and the Bishop's Palace; and the parish churches of S. Giovanni Maggiore, S. Pietro a Maiella, S. Arpino and S. Lorenzo, and all the other similar ones as well. The substantial damage they suffered in this disaster was in proportion to their size and the size of the place concerned. Thus some churches have been completely reduced to ruins, in some the cloister ceilings have collapsed, and in others parts of the nave have collapsed. At most churches the bell-towers have collapsed, their walls have partly collapsed, and the rest is leaning at an angle and cracked, and those which have suffered less damage have lost the roofs of the dormitories or of the churches themselves, or else the roofs are badly damaged. Palazzi and private houses have also suffered a great deal of damage of various kinds, depending on the quality of the buildings and their situation, for some are completely ruined, some have their interior in ruins, and in some the walls have partly collapsed, and what is left leans at an angle, and this is much more frequent in tall dwellings than in low ones. And it is estimated that about 100 people have been killed in this great disaster. That is what happened inside the city. Outside the city, but nearby, it struck the monastery of Monteoliveto and that of the Carthusians, which stands high above the city, above the castle of S. Elmo, which is almost completely in ruins. It did very great damage in the above monasteries. [...] then on Sunday [5 December] there were two more small [earthquakes] which, thank God, did no damage".

El danno, ch'egli à fatto nella cipttà e di fuori, è sì grande e ssi innumerabile, che senza dubbio egli è innistimabile e inriparabile [...] farò menzione de' più precipali, facciendo principio dalle chiese, le quali per l'essere maggiori hedificii, ànno ricievuto maggiore danno ch'e' palazzi e lle chase de' secolari. Et in questa parte dicho, per conclusione vera e universale, che non è chiesa né munistero [...] che non sia suto mirabilmente offeso, e' tetti quasi sono rovinati affatto. E per darvi qualche notitia, insignificho: la chiesa del Charmino, Santo Aghustino, San Francescho (che è distinta in tre munisteri, cioè Santa Chiara, Santa Maria della Nuova, San Lorenzo); San Piero Martire, Epischopio; et delle terre parrocchiali San Giovanni Maggiore, San Piero ad Marelle, Santo Arpino, Santo Lorenzo, et chosì tutte l'altre simili. Di questo fragiello ànno ricevuto verò danno sechondo la grandezza degli edifici e sechondo la grandezza del luogho. Però che c'è di quelle che ssono rovinate da' fondamenti, e alcune cie ne sono che ssono chaschate le volte de' chiostri, e altre che ssono chaschate parte delle navi. Delle chiese è lla maggiore parte cogli campanili in terra e parte delle mura chaschate e i resto inclinate e pelate et chi n'è avuto minore danno è col tetto de' dormentori o delle chiese scoperto e frachassato. I palazzi e lle chase de' secolari n'anno ricevuto ancora danno assai e varii, secondo la qualità degli edifici e' siti de' luoghi, perché alchune cie ne sono frachassate afatto, altre rovinate di dentro, alcuna chaschata parte delle mura e il resto inclinate; e queste sono

in numero assai più inverso le abitazioni alte che inverso le basse. E in questo sì grande frachasso ci si stima sieno morti circha di persone 100. E questo è stato dentro. Nelle terre di fuori, qui vicino, à percosso il munistero di Monte Uliveto e quello di Ciertosa, ch'è alto sopra la terra, sopra al chastello di Sant'Eremo, il quale è quasi rovinato affatto. Ne' predetti munisteroi à fatto danni assai. [...] di poi la domenicha ne venne due altri piccoli, che grazia di Dio niuno danno feciono.

A letter was sent from Naples on 8 December 1456 by the Florentine merchant Paolo Rucellai to his brother Giovanni: "We were asleep, and all woke up in great fright, and prayed for God's mercy, and by his grace our home was not damaged at all and we are all well. When day came, we went outside and found some incredible things, as you shall hear. The church of S. Giovanni Maggiore [...] with its three naves, the two side ones with their ceilings and columns, and the central nave with its roof, has completely collapsed; only the tribune of the high altar is left in the middle. The church of S. Maria Maggiore (a smaller building) has completely collapsed. Two towers opposite the bishop's palace have half collapsed, in spite of their immense thickness. One of them contained the head of St. Januarius, and a glass phial of the saint's blood was found in the ruins without a mark on it. The bell-tower of S. Arpino, built of brick (its walls more than two *braccia* thick), has split open and half of it has collapsed. The church of S. Agostino, which has three naves [...] lies partly in ruins, being wrecked right down to tomb level, and the choir is in ruins. The church of S. Domenico is split open and the front part is damaged [...]. At the church of S. Pietro Martire, the upper roof has completely collapsed and the body of the church has split open in a number of places. The church of S. Lorenzo has not been badly damaged, but the dormitory and interior living quarters are split open and in ruins. The church of S. Chiara is split open at a number of points, and part of the cloister is in ruins. The church of S. Maria Incoronata is split open at a number of points. And to conclude, all those churches in the city which remain standing are split open and in danger of collapse. Many houses have completely collapsed, most of the old Mint has collapsed, the home of the *Capitano* of the city completely collapsed, killing his brother and two of his children, the home of *messer* Lionetto Cicinello has completely collapsed, killing him and his wife and three children, and many other houses have been completely destroyed, with a great many victims. About five merlons have fallen off one of the central towers of the Castel Nuovo; inside, there are some cracks, and the church inside has been split right open. The castle of S. Elmo has been razed to the ground, killing eight people — such a thing has never been seen before; it had two towers whose walls were six or more *braccia* thick. The city could not have suffered worse damage; all the houses which did not collapse were split open and damaged, and about a hundred people have been killed. [...] Churches and tall buildings suffered greater damage than low buildings and houses. The Carthusian monastery and that of Monteoliveto have similarly suffered very serious damage".

Dormendo, con gran paura ci destamo tutti e raccomandamoci a Dio, e per sua grazia la chasa nostra non à ricievuto inpedimento alcuno e tutti siamo sani. Fatto-giorno uscimo fuora, dove trovamo chasi incredibili, come intenderete. La chiesa di Santo Ianni maggiore [...] con tre navi, le due dallato in volta e in colonne quella di mezzo a tetto, rovinata fino a' fondamenti; solo v'è restato in mezzo la trebuna dello altare maggiore. La chiesa di Santa Maria Maggiore (non era sì grande) rovinata fino a' fondamenti. Due torri dinanzi al Vescovado, di maravigliosa grossezza, rovinate fino al mezzo; in una d'esse era la testa di Santo Gienaro, e una anpolla di vetro con sangue di detto santo trovata sotto e' sassi senza alcuna macola. Lo champanile di Santo Arpino murato di mattoni (mura grosse più che due braccia) aperto e chascato fino al mezzo. La chiesa di Santo Agustino, con tre navi, una delle due dal lato ch'era in volta la maggiore parte per terra e sfondata fino alle sepolture, e 'l coro tutto guasto. La chiesa di Santo

Domenicho tutta aperta, e la parte dinanzi ispicchata e resta così. La chiesa di San Piero martire, il tetto di sopra tutto chaschato e il corpo della chiesa aperto in molti luoghi. La chiesa di Sa Lorenzo à rievuto pocho danno, il dormitorio e abitazioni dentro tutte aperte e disfatte. La chiesa di Santa Chiara aperta in molti luoghi e 'l chiostro rovinato una parte. La chiesa della Incoronata aperta in molti luoghi. Et conchiudendo, quante chiese à questa terra, che sieno restate in piè, sono tutte aperte e pericolate. Sono chadute molte chiese fino a' fondamenti, fra l'altre la Zeccha vecchia chaduta la maggiore parte, la chasa del Chapitano della terra chaduta fino a' fondamenti e mortovi il suo fratello e due figliuoli, la casa di messere Lionetto Cicinello chaduta fino a' fondamenti e mortovi lui e lla moglie e tre figliuoli, molte altre chiese rovinate fino a' fondamenti, e quale un palcho e quale due, dove è morta molta gente. Il chastello nuovo, d'una delle torri di mezo chaschato circha 5 merli; dentro à fatte alcune aperture, e la chiesa dentro tutta aperta. Il chastello di Sant'Ermo, rovinato e macinato fino a' fondamenti, mortovi 8 huomini, che mai si vide simile cosa; eranvi due torri colle mura grosse braccia sei o più. Questa terra à rievuto sì gran danno quanto fusse possibile; tutte le chiese, che non sono chaschate, sono restate aperte e intenebrate, ècci morto circha a 100 persone. [...] Anno rievuto maggior danno le chiese e gli edificii alti che gli edificii e chiese basse. La Ciertosa e 'l munistero di Monte Uliveto per lo simile anno rievuto grandissimo danno.

A letter was sent from Naples on 8 December 1456 by Filippo Strozzi, a banker, to his mother Alessandra: "By the grace of God, we have suffered little harm, apart from fright, but that was so great that I shall feel its effect for some time. A good deal of the roof collapsed above the floor where I have my bedroom: I thought the floor would come down, and I could see no way of avoiding the danger. I threw myself out of bed on to the floor, pushed aside a chest and thrust myself underneath it, staying there until the whole thing was over. Then I went outside with the others who were in the house; and so I slept in a galley for two nights. The really unpleasant thing is to see the wretched state of the city. All its twenty churches are in danger of collapse. Some have been split wide open, some have their bell-towers in ruins, in others many chapels have been destroyed and in others part of the church itself; and there are two which have been razed to the ground, namely S. Maria Maggiore and S. Giovanni Maggiore. The friars' quarters are partly in ruins and partly split open so badly that it would be very dangerous to live in them. Sixty houses lie completely in ruins, sometimes singly, sometimes in twos or threes; and more than four hundred have been reduced to an uninhabitable state: some of these are in ruins and others have been split open like pomegranates [...]. About fifty people have been killed, and many others have been injured by being struck or crushed. [...] God has been very merciful, for those earthquakes which followed were of little account, since they were small".

Noi, per grazia di Dio, da paura in fuori, poco altro danno abbiàno ricevuto; ma quella fu tale, che n'arò per buon pezzo. Sopra il palco di camera mia rovinò una buona parte del tetto: credetimi il palco ne venissi giù, e non vedevo allo scampo nessuno rimedio. Gitta'mi a terra del letto, e scostai una cassa, e ficcamivi sotto; e vi stetti tanto che la cosa fu posata. Poi con li altri di casa n'andammo fuori; e così ho dormito due notte in galea. La scura cosa è a vedere questa misera terra. Di venti chiese da farne conto, che ci sono, tutte sono pericolate; quale tutt'aperte, quale rovinati e campanili, e quale molte cappelle, e quale parte della chiesa; e due ce ne sono che insino a e fondamenti ne sono venute in terra; cioè, Santa Maria Maggiore e Santo Giovanni Maggiore. Li abituri de' frati, quali rovinati e quali aperti in modo che non si potranno abitare senza grandissimo pericolo. Da sessanta case rovinate sino a' fondamenti, dove una e dove due e dove tre insieme; e più che quattrocento che stanno in modo da non le potere più abitare: di quale è rovinato una parte, e l'altra aperta tutta come melagrana [...]. Sonci morte circa di cinquanta persone, e molti altri ci sono malati che hanno riceuto colpi e

strette. [...] Iddio ci ha fatto grandissima grazia, che da poi ne sono venuti alcuni da non ne fare conto, si sono suti piccoli.

In the letter of 22 December 1456, sent from Naples to duke Francesco Sforza, the Milanese ambassador Antonio da Trezzo refers to a shock which had been felt the previous night: "After the strong earthquake [5 December], it was felt again almost every night, and again last night [21-22 December], but not so strongly as to cause a house to collapse".

Dapoi che'l terremoto grande fu, quasi ogni nocte s'è sentito et etiam questa nocte passata, ma non de talle natura che habia facto ruynare una casa.

In the letter of 9 January 1457, sent from Naples to the authorities of the Sienese Republic, the ambassador Luca Amadei refers to a shock which had been felt the previous night: "from these terrible dangers caused by the earthquakes which are occurring day and night; there was one last night [that of 8-9 January] [...] but it did not do a great deal of damage".

da questi inestimabili pericholi per li tremuoti che ogni giorno e notte ci sonno; e quissta notte [...] n'abiamo avuto uno, il quale non à però fatto molto danno.

In the letter of 14 January 1457, sent from Naples to Cicco Simonetta secretary to the duke of Milan, Pier Candido Decembrio tells of a strong earthquake on 30 December: Then here [at Naples] on 30 of last month [December] there was a considerable earthquake, but very unlike the first [...], though it made me take to my heels with other groups of people [...] this city of Naples is at present like a wood at the top of a mountain, where you can only see rocks and trees, for here you can only see piles of stones and ruins; all the rest is shored up crosswise, with the result that you cannot see along

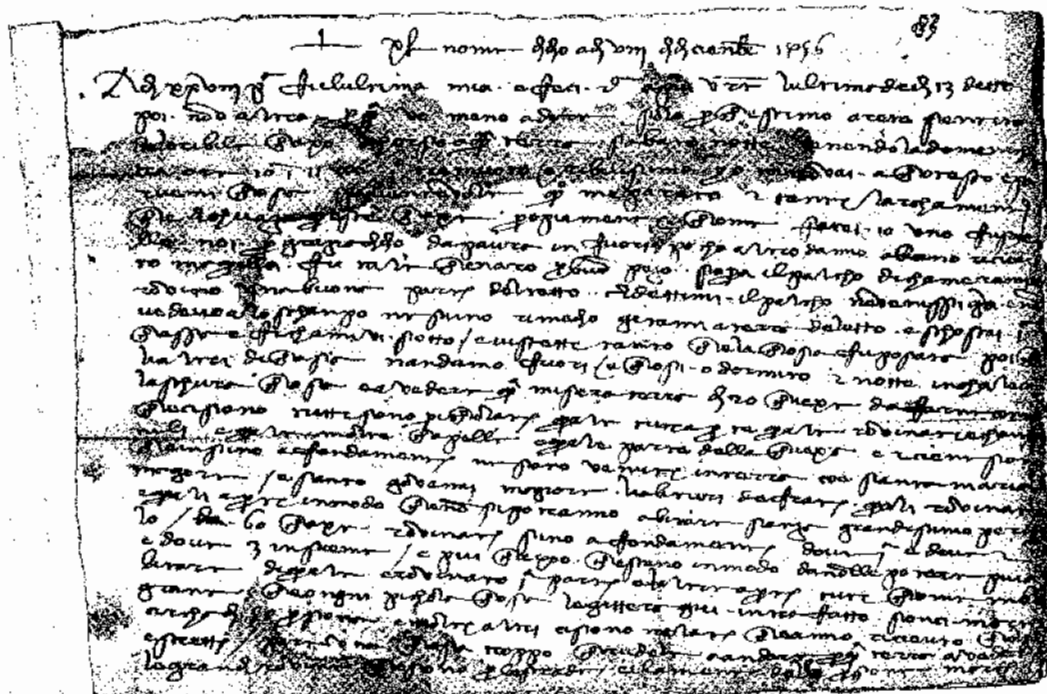


fig. 123 The letter from the Florentine banker Filippo Strozzi to his mother Alessandra, written in Naples on 8 December 1456. Strozzi wrote this letter when he was able to regain access to his damaged home, having spent two nights in the open air, as he himself points out (Archivio di Stato, Florence, *Carte Stroziane*, I, 325, fol.83).

the streets, and every day there is grave danger when houses are demolished for fear that they might collapse [...]. Castel S.Elmo is in ruins; the Charterhouse is full of cracks; and almost all the churches in the city are in a precarious state.

Qui depoi a iovedi a XXX del mese passato fu alquanto de terrimoto, ma molto dissimile dal primo [...] pur non fu che non mi facesse correre molto bene con gli altre brigate. [...] questa citade de Napoli al presente è in forma d'una silva in cima d'un monte, onde non si vede se non petre et arberi, cossi qui non si vede se non cumuli di petrete et de ruine; tuto el resto è apontilato in croce, in modo che non possite guardare per le vie, e ogni di cum gran periculo se giteno le case a terra per sbassarle, dubitando non faciano ruina, come farano tandem perché sono tute tromentate. El castello Sancto Heremo destructo; la Certosa tuta crepata; le chiese dela citate quasi tute in pirengelli.

The author of a report written at Naples, very probably in February 1457, was Goro di Giovanni, a Florentine citizen: "at the church of the bishop's palace in Naples, the whole roof was destroyed and part of the walls; the church of S.Maria del Carmine, beside the city walls, was also badly damaged; the church of S.Pietro inside the city was badly damaged; and all of the following were completely laid waste and reduced to ruins: the church of S.Domenico inside Naples; the church of S.Pietro Martire in Naples; the church of S.Agata [probably S.Agostino], where there is a monastery; the very large monastery of S.Chiera, with its splendid walls; the church of S.Francesco in Naples [probably S.Lorenzo]; the church of S.Giorgio in Naples; the fortress of S.Elmo, outside Naples, but close to the city walls; the church of the Carthusian monastery outside Naples, on the hill beside the walls; the church of Monteoliveto, outside Naples, but close to the walls; the house of the Sanseverino family, and many other great houses in Naples. The whole city was shored up, and more than 150 people died there that night in the earthquake, many of the victims remaining buried in the masonry for more than two months before they could be found".

la chiesa del Veschovado di Napoli rovinò tutto il tetto e parte della mura di detta chiesa; la chiesa di Santa Maria del Charmine, lato alle mura, ch'assai danno vi fece; la chiesa di Santo Pietro dentro i Napoli molto danno riceute; la chiesa di San Domenicho dentro i Napoli; la chiesa di San Piero Martiro i Napoli; la chiesa di Santa Agatha, dov'è u munistero; i munistero di Santa Chiara, grandissimo e notabile di mura; la chiesa di San Francescho di Napoli; la chiesa di San Giorgio di Napoli; la fortezza di Santo Emo, fuori di Napoli, lato ale mura; la chiesa di Certosa, fuori di Napoli, i sul poggio lato alle mura; la chiesa di Monte Uliveto, fuori di Napoli, a lato le mura; la chasa di Sansoverina, cho molte notabili chase di Napoli, le quali tutte rovinat e disfate. E tutta la terra era puntellata, e morivi in quella propia notte, per il detto tremuoto, più di 150 persone, che molli istettono sotto le pietre per più di 2 mesi, inanzi si potessero ritrovare.

In Manetti's treatise, we read: "Naples [...] suffered a great deal of damage of various kinds in these earthquakes, and the damage was a great deal worse than was first thought: of its large and famous basilicas, some lost their roofs and walls, some were half destroyed, and some were completely reduced to ruins. Some *palazzi* and other large buildings also collapsed, while others swayed so much that many pieces fell off them, both outside and inside. The vast extent to which private houses collapsed in the earthquakes is very clearly shown by the props and wooden shoring which can be seen scattered everywhere along the streets and at the crossroads. I will describe below the disasters which occurred inside the city; outside they were very widespread, but less serious and fewer in number. We have seen that the castle which takes its name from the holy martyr Erasmus and stood as a fortress a little above the city, has suffered such internal damage to its walls and rooms, and such external damage to its walls, that it appears to be more than half destroyed both inside and out. There was no escape from the disaster even for the two famous basilicas of Monteoliveto and

S.Martino, just outside Naples: the monastery roofs partly collapsed, and the walls of the basilicas and ambulatories displayed large cracks, as did a good many ceilings; and in most of the monks' cells, stones and masonry fell to the ground. And although the destruction in Naples was so great and general, yet miraculously fewer than one hundred people were killed inside and outside the city".

Neapolis [...] multa ac varia longeque maiora quam ab initio putabatur, ex his terremotibus damna suscepit. Nam nonnullae magne celebrateque basilice partim tecta et parietes amiserunt, partim vero semirute remanserunt, partim funditus corruerunt. Palatia insuper ingentiaque edificia, partim collapsa sunt, partim autem ita nutarunt ut plura eorum membra foris intusque conciderint. Quanta vero privatarum domorum labe consecuta fuerit, fulcra et lignea sustentacula, que hinc inde per vias et compita undique visuntur, manifestissime ostenderunt, atque hec intra urbem adversa molestaque acciderunt, extra vero nonnulla egregia licet multo minora ac pauciora quam intrinseca provenerunt. Nam et castellum titulo beati martyris Heremi nuncupatum, quod quidem urbi ipsi velut arx quedam altiuscule imminebat, ita intus in parietibus ac tricliniis, foris autem in menibus sic collapsum vidimus ut plusquam semirutum extrinsecus intrinsecusque apparuerit. Due insuper exteriores ac propinque et Montis Oliveti ac Sancti Martini titulo celebrate basilice nequaquam huius tante ac tam miserabilis calamitatis expertes remansere. Nam et monasteriorum tecta aliquatenus conciderunt, et basilicarum ambulatorumque parietes ingentes rimas simul cum pluribus fornicibus patefecerunt et plerumque monachorum celle saxa, petras et lapides ad terram dimisere, et quanquam hec Neapolitana clades tam magna ac tam universalis fuerit, non tamen mirabile dictu intus ac foris centum circiter hominum capita oppressit.

There is a document in a register of accounting records from the monastery of S.Domenico Maggiore in Naples (now in the Archivio di Stato at Naples, *Monasteri Soppressi*, 435, fol.1r., quoted in Figliuolo 1989) which states: "At the time when brother Michele Calamaro was prior, which was at the time of the earthquake, the church [of S.Domenico Maggiore] suffered damage, its roof and walls being reduced to ruins".

tempore prioratus fratris Michaelis Calamari, qui fuit tempore terremotus, fuit distorta ecclesia, et ruinata in tecto et muro.

Earthquake effects are also recorded in the following chronicles: the *Annales de Raimo*, the *Gesta archiepiscoporum magdeburgensium*, the *Diurnali* known as "of the duke of Monteleone", the *L'Aquila Cronaca* of Francesco D'Angeluccio, the annals of Lorenzo Bonincontri, the French chronicle of Jean Chartier, the *Notabilia temporum* of Angelo Tummolillo, the *Cronaca di Viterbo* of Nicola della Tuccia, the *Cronaca senese* of Tommaso Fecini, the chronicle of Guccierio da Gubbio, the *Diario della città di Roma* of Stefano Infessura, the *Dietari* of Melchior Miralles, the chronicle of Naples by Notargiacomo, the annals of Matteo Palmieri, the *Commentarii* of cardinal Enea Silvio Piccolomini, and the *Liber de vita Christi* by Bartolomeo Sacchi, known as Platina.

Pescocostanzo (province of L'Aquila)

Most houses collapsed. The collegiate church of S.Maria del Colle was rebuilt in 1466. Pescocostanzo was a village of 66 hearths (estimated population: 330), and there were 5 victims (1.5%). The sources are Manetti's treatise and an inscription. According to Manetti: "Most of Pescocostanzo collapsed, and five people perished".

Pisthium cognomine Costantium, plerumque collapsum, quinque personas occidit.

An inscription carved into one of the wooden trusses over the nave of the collegiate church of S.Maria del Colle at Pescocostanzo (published in Sabatini 1960, p.111) records its having been rebuilt: "In the year of Our Lord 1466 Giacomo Atino, the vicar, had this work carried out. Nicolò Chio, friend and senior priest".

Jacobus Atino Vicarius Anno Domini 1466 hoc opus fieri fecit. Nicolaus Chius dominus Amicus Praepositus.

Pietrelcina (province of Benevento)

There were damages. Pietrelcina was a village of 42 hearths (estimated population: 210), and there were 4 victims (1.9%). The source is Manetti's treatise: "They say that Pietrelcina, which is not far from Benevento, has been only slightly affected, since only four people were killed, and there was little other damage".

Petra cognomine Pulcina, non longe ab ipso Benevento distans, leviter lesa fuisse perhibetur, cum quator duntaxat homines interemit, ac pauca alia detrimenta protulerit.

Pizzone (province of Isernia)

There were damages. Pizzone was a village of 40 hearths (estimated population: 200), and there were 2 victims (1%). The sources are Manetti's treatise and Astesano's poem. Manetti records: "At Castelpizzuto [Pizzone] only two people were killed".

Castripizonium duos solummodo homines necavit.

Rapolla (province of Potenza)

A large proportion of its houses damages. Rapolla was a town of 161 hearths (estimated population: 805), and there were 10 victims (1.2%). The source is Manetti's treatise: "Carbonaria [Aquilonia] was razed to the ground and about thirty people were buried in the ruins. It is said that Rapolla was equally badly shaken, and that it mourns the death of ten people".

Carbonarium humi prostratum triginta circiter hominum capita contrivit. Rapallium pariter conquassatum decem personas desiderasse perhibetur.

San Donato Val di Comino (province of Frosinone)

More than a hundred houses collapsed. San Donato Val di Comino was a town of 159 hearths (estimated population: 795), and there were about 10 victims (1.2%). The source is Manetti's treatise: "Castel San Donato suffered the collapse of more than a hundred houses, but amazingly, there were no more than ten victims".

Castrum titulo Sancti Donati plurium quam centum domorum ruinam cum decem circiter et non plurium hominum mirabile dictu desiderio sensit.

Sant'Agata di Puglia (province of Foggia)

Some of its houses collapsed. The sources are five letters written between 7 and 8 December 1456 two contemporary chronicles and Astesano's poem. The letter sent from Foggia on 7 December 1456 was written by Ercole d'Este to his brother Borso: "Sancta Agata [...] and many other places have suffered a similar fate [part lies in ruins]".

Sancta Agata [...] e molte altre terre pur il simile [parte de la terra per terra].

Three letters were written in Naples by Giannozzo Manetti on 8 December. The first letter was written to his brother Filippo: "What follows is an account of the castles and villages which have been struck by this scourge: at Acerra, the town walls and a number of houses have collapsed [...] at Sant'Agata alla Palude, which consists of two castles, the same sort of thing has happened".

Quello che seguirà sarà il singnifichato delle chastella e delle terre che questo fragello à percosse: la Cerra colle mura e con più case in terra [...] a Sancta Agata, alla Palude, che ssono due chastella, à fatto il simile.

The second letter was written to the Florentine Signoria: Sant'Agata (*Sancta Aghata*)

is one of the places where the earthquake "has done a certain amount of damage, depending on the nature of the sites and the quality of the buildings; and a huge number of inhabitants have fled".

à fatti varii danni, secondo la varietà de' siti e lla qualità d'edificii, e grande e innistimabile 'vasione degli abitanti.

The third letter was written to Vespasiano da Bisticci: "Sant'Agata (*Sant'Aghata*) is one of the places where the earthquake "has struck to a greater or lesser extent, causing varying amounts of damage according to the vulnerability and position of the places concerned, for in some of the above-mentioned villages it seriously damaged their walls, in others it demolished houses, and yet others collapsed into the ground, thereby killing many people".

ha percusso variamente, et facto varij danni secondo la debolezza et sito de' luoghi, peroché a parte delle terre predecite ha frachassate le mura, a parte rovinato delle case et a parte sprofondatole con grande occisione di molte persone.

A fourth letter, sent from Naples on 8 December 1456, was written by the Florentine merchant Paolo Rucellai to his brother Giovanni: *Sant'Agata* is one of the places that the earthquake "has damaged" (*à dannegiato*). *Sant'Agata* is recorded in the French chronicles of Jean Chartier and Mathieu d'Escouchy as one of the places which suffered many collapses.

Sulmona (province of L'Aquila)

Many houses and other buildings collapsed. Sulmona was a town of 809 hearths (estimated population: 4,045), and there were about 12 victims (0.2%). The sources are three letters and a report dating to December 1456 and January 1457, Manetti's treatise, a *Notula* in the margin of codex 47 in the Archivio dell'Abbazia of Montecassino, three contemporary chronicles and Astesano's poem. The first letter sent from Foggia on 12 December 1456 to marquis Luigi III Gonzaga was written by the Mantuan ambassador: "One of the king's courtiers at Sulmona says (that the earthquake) has caused great damage to houses and people".

Un cortesano del re a Salmora dice ha fatto gran danno de case e huomini.

The second letter sent from Naples on 14 December 1456 was written by the Florentine merchant Paolo Rucellai to his brother Giovanni: "Sulmona d'Abruzzo [has] suffered very great damage".

Sermona d'Abruzzi ricevuto grandissimo danno.

The sender and recipient of the third letter, probably dating to January 1457, are unknown: "The town of Sulmona [is] mostly in ruins".

La città di Solmona nella massima parte guasta.

The report of unknown authorship, probably dates to January 1457, was sent to cardinal Prospero Colonna: "Sulmona has suffered damage throughout".

Sermona è tutta straciata.

According to Manetti: "At Sulmona, that ancient town [...] many houses and various other buildings collapsed, and about twelve people were killed".

Sulmo vetusta urbs [...] plures domos diversasque edes cum duodecim circiter hominum capitibus corruisse.

The *Notula*: "In truth, Gaeta [...], Sulmona [...] and in Abruzzo, castles, churches and villages suffered exceptional damage, with the result that in some places only one

house remained standing, and in others four, and in yet others ten, while in some places castles were submerged in raging waters”.

Verum Gaiete, Neapoli, Suesse. Isernia, Sermone, Albeto, et in Aprutio castra, ecclesie, ville, mirabiliter ruerunt sic ut in quibusdam locis vel castris sola remansit, alibi quator domus, ubi vero decem, nec non et alibi aquis rapientibus castra submersa extiterunt.

Sulmona is recorded in the following chronicles as having suffered substantial damage: the *Annales de Raimo* and the L'Aquila chronicle of Francesco D'Angeluccio.

Tramonti (province of Salerno)

Some houses collapsed. Out of approximately 1,625 inhabitants, there were about 15 victims. The source is Manetti's treatise: "Salerno, Cava and the mountainous region commonly called the Amalfi Coast [...] suffered little or no damage, with the sole exception of Tramonti, where the collapse of just a few houses caused the death of about 15 people”.

Salernum, Cava, et ea montana regio que Costa Amalfia vulgo appellatur [...] quoniam Tramontio duntaxat excepto, nulla vel pauca exinde detrimenta perceperunt, quod quidem, cum parva quadam nonnullarum domorum ruina, quindecim circiter personas desideravit.

Troia (province of Foggia)

The cathedral and about two hundred houses collapsed. The old castle and many churches were seriously damaged. Troia was a town of 613 hearths (estimated population: 3,065), and there were 40 victims (1.3%). The effects are very well documented because Troia was the ancient seat of a bishop. The sources are nine letters and three reports written during the months of December 1456 and January 1457, Manetti's treatise, four contemporary chronicles and Astesano's poem. The first letter sent from Foggia on 7 December 1456, was written by Ercole d'Este to his brother Borso: "Half of Troia is in ruins, and many people have been killed”.

Troya la meza terra e morte zente assay.

The second letter sent from Naples on 8 December 1456, was written by Manetti to his brother Filippo: "What follows is an account of the castles and villages which have been struck by this scourge: [...] Benevento [...] was worst damaged, and Troia”.

Quello che seguirà sarà il singnifichato delle chastella e delle terre che questo fragello à percosse: [...] Benevento [...] à ricevuto maggiore danno, e Troia.

The third letter sent from Naples on 8 December 1456 was written by Giannozzo Manetti to the Florentine *Signoria*: Troia is included amongst places where the earthquake "has done a certain amount of damage, depending on the nature of the sites and the quality of the buildings; and a huge number of inhabitants have fled”.

à fatti varii danni, secondo la varietà de' siti e lla qualità d'edificii, e grande e innistimabile 'vasione degli abitanti.

The fourth letter sent from Naples on 8 December 1456 was written by Giannozzo Manetti to Vespasiano da Bisticci: Troia is included amongst places where the earthquake "has struck to a greater or lesser extent, causing varying amounts of damage according to the vulnerability and position of the places concerned, for in some of the above-mentioned villages it seriously damaged their walls, in others it demolished houses, and yet others collapsed into the ground, thereby killing many people”.

ha percosso variamente, et facto varij danni secondo la debolezza et sito de' luoghi, peroché a parte delle terre predecete ha frachassate le mura, a parte rovinato delle case et a parte sprofondatole con grande occisione di molte persone.

The fifth letter sent from Naples on 8 December 1456 was written by the Florentine merchant, Paolo Rucellai, to his brother Giovanni: *Troia* is included amongst places where the earthquake "has damaged" (*à dannegiato*). The sixth letter sent from Naples on 9 December 1456 was written by Pere Dusany to the Catalan deputies: "Apice, Troia and other places, all of them large, have been so badly damaged that they will not recover their former state".

Apixi, Troya e altres terres, totes grosses, han pres tant dan que nunca tornaran.

The seventh letter, sent from Foggia on 12 December 1456, was written to marquis Luigi III Gonzaga by the Mantuan ambassador: "At Troia, which is on this side of the mountain, many houses and almost all the churches have been reduced to ruins [...], as well as the old castle, a strong building".

In Troya, ch'è di qua del monte, sono ruinate molte case et quasi tutte le chiese [...], e 'l castel vecchio, forte edificio.

The eighth letter sent from Naples on 14 December 1456 was written by the Florentine merchant Paolo Rucellai to his brother Giovanni: "Ascoli di Puglia and Troia [have] suffered a great deal of harm from collapses and fatalities".

Ascoli di Puglia et Troia ricievuto danno assai di cose chascate e di gente morta.

The first report is attached to the letter of 22 December 1456 sent from Naples by the Milanese ambassador Antonio da Trezzo to duke Francesco Sforza: "A large proportion of the houses at Troia have collapsed, and many people have been killed".

Ad Troya caschato una grande parte del casamento et morte molte gente.

The sender and recipient of the ninth letter, probably dating to January 1457, are unknown: "The towns of Troia, Apice [...] have suffered in the great earthquake, and many houses have collapsed and many people have been killed; but no town has been completely destroyed".

La città di Troia, Apice [...] hanno sofferto gran terremoto, e sono cadute molte case, e molta gente è rimasta morta; ma nessuna città è sprofondata.

The second report of unknown authorship, probably dates to January 1457, was sent to cardinal Prospero Colonna: "Alife [...], Troia [...] some have been swallowed up and others largely reduced to ruins".

Aliphe [...], Troia [...], chi in abisso e chi ruinato in gran parte.

The third report was written at Naples, very probably in February 1457, by Goro di Giovanni, a Florentine citizen: "Salerno, Troia [...] all these towns and castles have been badly affected by these earthquakes, and so have the churches and chapels inside them, as well as many *palazzi* and towers".

Salerno, Troia [...] tutte queste città e chastella furono per i detti tremuoti malamente perchose, e simile le chiese e oratori che dentro vi sono, e molti de li palagi e torri.

According to Manetti's treatise: "Troia, a new town [...] suffered the destruction of its principal basilica, or cathedral, as it is commonly called, and mourned the death of forty people as well as the collapse of about two hundred houses".

Troia nova urbs [...] maiorem, et ut vulgo dicitur cathedralem, opidi basilicam per repentium casum decefisse, et ducentas circiter domos cum quadraginta mortalibus desideratis corruisse percepit.

Pierozzi records: "The town of Troia has been destroyed, and so has the bishop's church, together with 200 houses; the number of victims is not known".

Troye civitas destructa, ecclesia eius episcopalis diruta, domibus CC et numero defunctorum ignoto.

Troia is recorded in the following chronicles as having suffered many collapses: the annals of Lorenzo Bonincontri, the French chronicle of Jean Chartier and the *Dietari* of Melchior Miralles.

Vairano Patenora (province Caserta)

There was a great deal of damage, but details are not given. The source is a letter sent from Naples on 8 December 1456 by the Florentine merchant Paolo Rucellai to his brother Giovanni: "At Calvi, Teano, Vairano [...] the earthquake has done a great deal of damage".

Calvi, Tiano, Vairano [...] fatto danno assai.

Venosa (province of Potenza)

It was very badly damaged. Venosa was a town of 593 hearths (estimated population: 2,965), and there were 10 victims (0.3%). The sources are a letter of 12 December 1456, Manetti's treatise and Pierozzi's chronicle. The letter was sent from Foggia on 12 December 1456 to marquis Luigi III Gonzaga by the Mantuan ambassador: "Venosa and many other castles in Abruzzo have been badly damaged and reduced to ruins, some in their entirety".

Venosa e altri castelli assai de Abruzzo sono molti quassati e ruinati, alcuni in tutto.

Manetti writes: "Venosa was very badly damaged, but only ten people were killed".

Venusium plurimum laceratum decem duntaxat personas interemit.

According to Pierozzi: "Other towns and castles, which are named here, were largely destroyed, Venosa being an example".

Aliis vero civitatibus vel castris, que hic modo nominabuntur, in magna parte destructis, ut Venusia.

Venticano (province of Avellino)

The church of S.Maria was so badly damaged that part of it was in danger of collapse. The monastery was similarly affected. A number of buildings owned by the church also collapsed. The source is a document dating to 7 October 1460. The text has been transcribed by the historian Giovanni De Nicastro (1654-1738) in his ecclesiastical history of Benevento, published in 1976 (pp.122-5). In it, the archbishop of Benevento, Giacomo della Ratta, records his decision to annex the church and monastery of S.Maria at Venticano to the basilica of S.Bartolomeo at Benevento, because the former have suffered badly in war and the earthquake: "And therefore, since the effects of time and the disturbances of war, which have afflicted these areas over a long period, as well as the force of an earthquake, have threatened serious damage to the church itself as well as to the house, and since property belonging to that church has been reduced to ruins, and since these events have caused such a decrease in the church's income that its property can scarcely be repaired at all, if this union were brought about, repairs would be carried out more rapidly, and holy worship would be reinvigorated".

et ex eo quod propter temporum discrimina, et guerrarum turbines, quae partes istas diutius afflixerunt, ac Terraemotus impetum, ac magnam in parte ruinam Ecclesia ipsa minatur et domus, et possessiones ipsius Ecclesiae dirutae solo lenus fuere, propter quae omnia fructus eiusdem Ecclesiae sunt adeo diminuti, quod Divinus Cultus tolerari, et ruina ipsarum reparari minime potest, quod si dicta unio fieret, et reparatio celerius in manibus, et divini cultus fieret innovamentum.

Capua (province of Caserta)

Between sixty and a hundred houses collapsed, as well as some of the town's defensive towers and a bridge. There was a strong aftershock on 10 February 1457 which caused three houses to collapse. The sources are eight letters and two reports dating between December 1456 and February 1457, Manetti's treatise, five contemporary chronicles and Astesano's poem. The first letter sent from Naples on 6 December 1456 was written to duke Francesco Sforza by the Milanese ambassador Antonio da Trezzo: "At [...] Capua [...] and in many other towns and castles, the earthquake has likewise done great damage".

A [...] Capua [...] et in molte altre città et castelle è simelmente facto grande damno.

The second letter sent from Naples on 8 December 1456 was written by Giannozzo Manetti to his brother Filippo: "at Capua and all the surrounding places as far as Sessa, the earthquake has done a great deal of damage".

a Chapua e a tutte le terre circhustantie insino a Xexa à fatti danni assai.

The third letter sent from Naples on 8 December 1456 was written by Giannozzo Manetti to the Florentine *Signoria*: Capua (*Capova*) is included amongst places where the earthquake "has done a certain amount of damage, depending on the nature of the sites and the quality of the buildings; and a huge number of inhabitants have fled".

à fatti varii danni, secondo la varietà de' siti e lla qualità d'edificii, e grande e innistimabile 'vasione degli abitanti.

The fourth letter sent from Naples on 8 December 1456 was written by Giannozzo Manetti to Vespasiano da Bisticci: *Capua* is included amongst places where the earthquake "has struck to a greater or lesser extent, causing varying amounts of damage according to the vulnerability and position of the places concerned, for in some of the above-mentioned villages it seriously damaged their walls, in others it demolished houses, and yet others collapsed into the ground, thereby killing many people".

ha percosso variamente, et facto varij danni secondo la debolezza et sito de' luoghi, peroché a parte delle terre predecite ha frachassate le mura, a parte rovinato delle case et a parte sprofondatole con grande occisione di molte persone.

The fifth letter sent from Naples on 8 December 1456 was written by the Florentine merchant Paolo Rucellai to his brother Giovanni: "at Capua more than a hundred houses [have] collapsed, and a number of people [have been] killed".

Capova, chadutovi più che ciento chase e mortovi più persone.

The sixth letter sent from Foggia on 12 December 1456 to marquis Luigi III Gonzaga was written by the Mantuan ambassador: "At Capua there has been little damage: they simply say that the famous bridge has been broken. Its castles have collapsed, and they say that there has been little other damage to houses or persons".

A Capoa è stato poco danno, solo se dice abscisso quello notabel ponto. Sono cascato li castelli di essa, e dicono con poco altro danno de case e homini.

The sender and recipient of the seventh letter, probably dating to January 1457, are unknown: "The town of Capua. About 60 houses have been destroyed, and the town bridge has completely collapsed, as well as everything else involved".

La città di Capua. Circa 60 case distrutte, e il ponte della città caduto da cima a fondo, e tutto ciò che vi era di mezzo pure caduto.

The first report of unknown authorship, probably dates to January 1457, was sent to cardinal Prospero Colonna: "At Capua many houses have collapsed".

Capua molte case per terra.

The eighth letter sent from Naples on 11 February 1457 was written by the Milanese envoy Francesco Cusani to duke Francesco Sforza: "Master Matheo Malferito [...] told me that last night three houses also collapsed at Capua because of the earthquake".

Meser Matheo Malferito [...] m'ha dicto che questa nocte passata sono per terrimoto caschate ancora tre case a Capua.

The second report was written at Naples, very probably in February 1457, by Goro di Giovanni, a Florentine citizen: "The town of Capua, Carinola [...]; all these towns and castles were badly affected by these earthquakes, and so were the churches and chapels within them and many *palazzi* and towers".

La città di Chapova, Gharinole [...]; tutte queste città e chastella furono per i detti tremuoti malamente perchose, e simile le chiese e oratori che dentro vi sono, e molti de li palagi e torri.

According to Manetti's treatise: "Capua, which was once called Vulturnium because the famous river Volturno bathes its walls, and all the castles, villages and farms in its territory felt the violence of these earthquakes to the extent that there was serious damage at Capua, involving both private houses and public towers".

Capua, olim Vulturnium a Volturno celebrato fluvio eius menia abluyente nuncupata, et omnia ipsius castella, pagi ac ville usque adeo hanc vehementiam senserunt, ut plura cum privatis domibus tam publicis turribus detrimenta pertulerit.

According to the chronicle of Pierozzi: "Capua, which is 18 miles from Naples in the Rome direction, has suffered damage to its houses, and some of the towers built for the defence of the town have collapsed. There is no report of the number of victims".

Capua, que a Neapoli distat per XVIII miliaria versus Romam, detrimentum accepit in domibus eius, et pars turrium, que ibi sunt pro custodia civitatis, cecidit, numerus mortuorum non est relatus.

Capua is recorded amongst badly damaged places in the following chronicles: the French chronicle of Jean Chartier, the *Notabilia temporum* of Angelo Tummolillo, the *Dietari* of Melchior Miralles, and the *Liber de vita Christi* by Bartolomeo Sacchi, known as Platina.

Mercato San Severino (province of Salerno)

Some collapses occurred, and there was some damage to buildings. The sources are three letters, all of 8 December 1456. The first letter was sent from Naples on 8 December 1456 by Giannozzo Manetti to the Florentine *Signoria*: San Severino (*San Soverino*) is included amongst places where the earthquake "has done a certain amount of damage, depending on the nature of the sites and the quality of the buildings; and a huge number of inhabitants have fled".

à fatti varii danni, secondo la varietà de' siti e lla qualità d'edificii, e grande e innistimabile 'vasione degli abitanti.

The second letter was sent from Naples on 8 December 1456 by Giannozzo Manetti to Vespasiano da Bisticci: San Severino (*Sansoverino*) is included amongst places where the earthquake "has struck to a greater or lesser extent, causing varying amounts of damage according to the vulnerability and position of the places concerned, for in some of the above-mentioned villages it seriously damaged their walls, in others it demolished houses, and yet others collapsed into the ground, thereby killing many people".

ha percosso variamente, et facto varij danni secondo la debolezza et sito de' luoghi, peroché a parte delle terre predecite ha frachassate le mura, a parte rovinato delle case et a parte sprofondatole con grande occisione di molte persone.

The third letter sent from Naples on 8 December 1456 was written by the Florentine merchant Paolo Rucellai to his brother Giovanni: San Severino (*San Soverino*) is included amongst places which the earthquake "has damaged" (*à dannegiato*).

Minturno [formerly Traetto] (province of Latina)

Slightly damaged. The source is a letter sent from Foggia on 12 December 1456 to marquis Luigi III Gonzaga by the Mantuan ambassador: "It seems that in the villages from Traietto onwards the earthquake did not do much damage anywhere".

Per le terre ne pare da Traietto in là habbia in luoco alcuno fatto molto danno.

Biccari (province of Foggia)

There was serious damage. The sources are a letter and two reports dating to December 1456 and January 1457, Manetti's treatise, two contemporary chronicles and Astesano's poem. The letter sent from Foggia on 7 December 1456 was written by Ercole d'Este to his brother Borso: "First of all Ariano was completely destroyed [...]. At another place, called Paduli, of 3,000 souls, every one was killed. At another place, called Biccari, something similar happened, with the result that nobody could tell where the settlements had been".

Et primo è submerso Ariano [...]. Un'altra terra che se domanda Padule, la quale facea dele anime 3000, le quale sono tutte morte. Un'altra terra che se domanda Bicheri il simile, a tanto che persona non poteria indicare in quelli lochi fosse may state terre.

The first report is attached to the letter of 22 December 1456 sent from Naples by the Milanese ambassador Antonio da Trezzo to duke Francesco Sforza: "At Biccari, too and at Bovino, [the earthquake] has done a great deal of damage".

A Bicheri similmente et a Bovino ha facto grandissimo danno.

The second report of unknown authorship, probably dates to January 1457, was sent to cardinal Prospero Colonna: "Alife [...], Biccari, some have been swallowed up and others largely reduced to ruins".

Aliphe [...], Biccari, chi in abisso e chi ruinato in gran parte.

According to Manetti: "Alberona did suffer some damage, but it was so slight that it can be disregarded and passed over in silence, except that two people were crushed to death; we have to say that we think the same is true of Biccari".

Alveronium sensit quidem damna, sed ita pauca fuere ut pronullis nisi de duobus tantummodo obtritis habeantur ac silentio pretermittantur, quod de Bicherio pariter sentimus et dicimus.

In Pierozzi's chronicle, Biccari (*Bucherium*) is included amongst places that were "largely destroyed" (*in magna parte destructis*). Biccari is recorded in the French chronicles of Jean Chartier and Mathieu d'Escouchy amongst places which suffered many collapses.

Calvi Vecchia (province of Caserta)

There was considerable damage to the fortress and church, as well as to the bishop's palace and adjacent buildings. The sources are two letters of 7 and 8 December 1456, a papal brief of 23 April 1457, Manetti's treatise and a contemporary chronicle. The first letter sent from Naples on 7 December 1456 was written by the Sieneese ambassador, Bindo Bindi, to the authorities of the Sieneese Republic: "At Calvi, the fortress was reduced to ruins".

Ad Calvia ruynata la rocha.

The second letter sent from Naples on 8 December 1456 was written by the Florentine merchant Paolo Rucellai to his brother Giovanni: "At Calvi [...] [the earthquake has] done a great deal of damage".

Calvi [...] fatto danno assai.

In the brief issued on 23 April 1457, pope Calixtus III grants indulgences for the rebuilding of the church at Calvi (Archivio Segreto Vaticano, *Registra Vaticana*, 447, fol.123v). The document is quoted in Figliuolo (1988-89): "Since we have been informed that the church of Calvi, on account of the horrendous and memorable earthquake which badly affected those parts in recent months together with the bishop's palace and other adjacent buildings, has been destroyed and lies in ruins, so that what before the destruction was a thing of beauty now no longer looks like a church, but rather like debris or a chance pile of stones".

Cum itaque sicut accepimus ecclesia Calvensis propter horrendum et omni seculo memorandum casum fortuitum terremotuum quibus partes ille superioribus mensibus miserabiliter comquassate fuerunt cum episcopali hospitio et aliis edifiitiis illi adiacentibus adeo diruta et solo prostrata sit ut illa que ante ruinam huiusmodi valde formosa aspectu extitebat iam non ecclesie effigiem habeat sed maceria aut congeries quedam lapidum esse videatur.

Manetti records: "Teano and Caleno [Calvi] as well [...] have felt these same earthquakes (which spread across the whole countryside), but they suffered only slight damage".

Theanum quoque ac Calenum [...] eos ipsos terremotus, cum paucorum damnorum susceptione, per universum agrum audivisse dicimus.

Calvi is recorded in the *Notabilia temporum* of Angelo Tummolillo amongst places which partly collapsed and were partly damaged.

Carinola (province of Caserta)

Suffered only slight damage. The sources are a letter of 8 December 1456 and a report dating very probably to February 1457. The letter sent from Naples on 8 December 1456 was written by Giannozzo Manetti to the Florentine *Signoria*: Carinola is included amongst places where the earthquake "has done a certain amount of damage, depending on the nature of the sites and the quality of the buildings; and a huge number of inhabitants have fled".

à fatti varii danni, secondo la varietà de' siti e lla qualità d'edificii, e grande e innistimabile 'vasione degli abitanti.

The report was written in Naples, very probably in February 1457, by Goro di Giovanni, a Florentine citizen: "The town of Capua, Carinola [...]; all these towns and castles were badly affected by these earthquakes, and so were the churches and chapels within them and many *palazzi* and towers".

La città di Chapova, Gharinole [...] tutte queste città e chastella furono per i detti tremuoti malamente perchose, e simile le chiese e oratori che dentro vi sono, e molti de li palagi e torri.

Cassino [formerly San Germano] (province of Frosinone)

Churches and their bell-towers were damaged. The sources are a letter of December 1456 and Manetti's treatise and a contemporary chronicle. The letter was sent from Naples on 7 December 1456 by the Siennese ambassador, Bindo Bindi, to the authorities of the Siennese Republic: "At San Germano, so I have been told by the Scanderbegh ambassador on his arrival from Rome, churches and bell-towers have been damaged".

Ad San Germano, me ha dicto lo ambassiatore de Scanderbegh che veniva da Roma, ruynate chiesie et campanili.

According to Manetti: "Starting at Gaeta, then, we can say that, with Formia and Sessa [...] and Teano and Calvi as well, and also Cassino [...] felt those earthquakes, which extended throughout the countryside, but without causing much damage".

A Caieta itaque initium sumentes, eam ipsam cum Mola ac Suessam [...] et Theanum quoque ac Calenum et Casinum [...] eos ipsos terremotus, cum paucorum damnorum susceptione, per universum agrum audivisse dicimus.

In the *Notabilia temporum* Angelo Tummolillo records not only the great earthquake of 5 December itself, but also the numerous aftershocks which persisted until the end of May 1457: "When the earthquake began to be felt, the earth constantly shook and rose up with all the buildings, now a little and now more, and jolting a great deal for as long as it would take to recite the Lord's Prayer ten times. During that time the earth moved and trembled three times in succession with great jolting which caused buildings to collapse; and then it calmed down. On that same Sunday the earthquake made itself felt nine times in succession until evening, and it continued for more days in that week, sometimes twice and sometimes three or four times a day; during the days that followed it was felt at longer intervals and more weakly. And during the first earthquake [5 December] the earth was shaken to the depths and all water came forth as cloudy as faeces for three or four days. Similarly, on Thursday 23 [30] of that same month of December, towards the third hour of the day, there was another substantial earth movement, which caused cloudy water to flow out for two days, and many other buildings collapsed. And the earthquake was subsequently felt again, sometimes on three occasions and sometimes at intervals until April and May of that year".

qui terremotus quando cepit tremere sine intermissione terra tremebat et sese sublevabat cum omnibus hedificiis, quando paulisper et quando plus et plurimum sublevando per spatium temporis dicendi decies patrenostri. inter quod spatium tribus vicibus et insultibus magnis terra se submovit et insultavit, et tunc in dictis insultibus corruerunt hedificia, postea quievit pro illo tunc. set in ipso die dominico dictus terremotus fuit novem vicibus usque ad sero, et sic per alios dies infra ipsam ebdomadam quando bis quando ter et quater imminebat; postea subsequentibus diebus interpollatim et magis remisse sentiebatur. et in primo terremotu motus est terre abissis et omnes aque scaturizabant turbide velut feces usque ad tres vel quatuor dies. et similiter die iovis .XXIII. dicti mensis decembris hora quasi tertia diey fuit alius arduus terremotus, ex quo etiam fluxerunt aque turbide per duos dies et corruerunt multa alia hedificia. et ex post omni mense magis interpollatum quandoque ter et quandoque erat infra mensem usque ad mensem aprilis et madii dicti anni.

Formia (province of Latina)

It suffered little damage. The source is Manetti's treatise: "Starting at Gaeta, then, we can say that, with Formia and Sessa [...] and Teano and Calvi as well, and also Cassino [...] felt those earthquakes, which extended throughout the countryside, but without causing much damage".

A Caieta itaque initium sumentes, eam ipsam cum Mola ac Suessam [...] et Theanum quoque ac Calenum et Casinum [...] eos ipsos terremotus, cum paucorum damnorum susceptione, per universum agrum audivisse dicimus.

Gaeta (province of Latina)

Numerous buildings were damaged, but there were no collapses. The sources are four letters of 8 December 1456, a report written very probably in February 1457, a

Notula in the margin of codex 47 in the Archivio dell'Abbazia of Montecassino, Manetti's treatise and a contemporary chronicle. The first three letters were written by Giannozzo Manetti. The first letter was sent from Naples on 8 December 1456 to his brother Filippo: "and the earthquake also reached as far as Gaeta but did little damage there".

e giunse ancora in fino a Ghaeta, e fecievi poco danno.

The second letter was sent from Naples on 8 December 1456 to the Florentine Signoria: "Although at neither place, that is to say at Gaeta and Foggia, did the earthquake do much damage, it did indeed reach there, leaving neither place intact, for the signs of shaking remain".

e bene che nell'uno luogo e nell'altro, cioè da Gaeta a Foggia, non abbia fatto molto danno, pure v'agiunse, e l'uno e l'altro luogo non lasciò netto, perché v'è lasciato il sengnio della percossa.

The third letter was sent from Naples on 8 December 1456 to Vespasiano da Bisticci: Gaeta is included amongst places where the earthquake "has struck to a greater or lesser extent, causing varying amounts of damage according to the vulnerability and position of the places concerned, for in some of the above-mentioned villages it seriously damaged their walls, in others it demolished houses, and yet others collapsed into the ground, thereby killing many people".

ha percosso variamente, et facto varij danni secondo la debolezza et sito de' luoghi, peroché a parte delle terre predecite ha frachassate le mura, a parte rovinato delle case et a parte sprofondatole con grande occisione di molte persone.

The fourth letter, sent from Naples on 8 December 1456, was written by the Florentine merchant Paolo Rucellai to his brother Giovanni: Gaeta is included amongst places that the earthquake "has damaged" (*à danneggiato*). The report was written in Naples, very probably in February 1457, by Goro di Giovanni, a Florentine citizen: "The town of Gaeta, and Ariano; all these towns and castles were badly affected by these earthquakes, and so were the churches and chapels within them and many *palazzi* and towers".

la città di Ghaeta, Ariano; tutte queste città e chastella furono per i detti tremuoti malamente perchose, e simili le chiese e oratori che dentro vi sono, e molti de li palagi e torri.

The *Notula*: "In truth, Gaeta [...], and in Abruzzo, castles, churches and villages suffered exceptional damage, with the result that in some villages or castles only one house remained standing, and in others four, and in yet others ten, while in some places castles were submerged in raging waters".

Verum Gaiete [...], et in Aprutio castra, ecclesie, ville, mirabiliter ruerunt sic ut in quibusdam locis vel castris sola remansit, alibi quator domus, ubi vero decem, nec non et alibi aquis rapiantibus castra submersa extiterunt.

According to Manetti's treatise: "Starting with Gaeta, we can say that it, along with Nola and Sessa [...] felt these earthquakes (which extended throughout the countryside), but they suffered only slight damage".

A Caieta itaque initium sumentes, eam ipsam cum Nola ac Suessam [...] eos ipsos terremotus, cum paucorum damnorum susceptione per universum agrum audivisse dicimus.

Gaeta is recorded as having been damaged in the *Liber de vita Christi* by Bartolomeo Sacchi, known as Platina.

Marigliano (province of Naples)

Suffered only very slight damage. The source is Manetti's treatise: "There remain the important towns of Acerra, Marigliano [...] since they suffered little or no damage from the earthquakes. Mereliano, which we now call Marigliano, is a town near Acerra. It was damaged, but the damage was so slight as to be negligible".

Acerre, Merelianum [...] presertim cum nulla vel pauca exinde damna perceperint. [...]. Merelianum, quod nunc Marilianum dicimus, finitimum Acerris opidum sensit quidem damna, sed ita pauca fuerunt ut pro nullis habeantur.

Monticchio (province of Potenza)

A bridge collapsed. The source is a document of 24 May 1457 (Archivio Segreto Vaticano, *Registra Vaticana*, 463, fol.44r.), which is quoted in Figliuolo (1988-89). It is a privilege issued by pope Calixtus III, granting six years of indulgences to two people living in the diocese of Melfi if they rebuild the bridge: "We are informed that a bridge over a certain river which flows below the castle of Monticchio in the above diocese [...] a bridge which in former times was begun by some of the faithful and was almost completed, has been totally destroyed by the earthquake which has so badly affected that area in recent months".

Cum itaque sicut accepimus [...] quendam pontem super certo flumine subtus castrum Monticli dicte diocesis profuente alias per non nullos fideles inceptum et quasi totaliter perfectem, sed propter terremotus quibus partis ille superioribus mensibus miserabiliter afflicte fuerunt, funditus demolitum.

Nola (province of Naples)

A few houses were damaged. There were no victims. The sources are five letters written between 7 and 8 December 1456, a report very probably written on February 1457, Manetti's treatise, two contemporary chronicles and Astesano's poem. The first letter sent from Naples on 7 December 1456 was written by the Sienese ambassador, Bindo Bindi, to the authorities of the Sienese Republic: "At la Cora [Acerra], Nola, and Salerno the earthquake has done very serious damage, and more than half the town walls have collapsed".

Ad la Cora, ad Nola, ad Salerno facto grandissima ruyna; et più che la mità dele mure dela terra cascade.

The second letter sent from Naples on 8 December 1456 was written by Giannozzo Manetti to his brother Filippo: "What follows is an account of the castles and villages which have been struck by this scourge: [...] at Acerra the town walls and a number of houses are in ruins; [...] the same is true for a number of houses at Nola".

Quello che seguirà sarà il singnifichato delle chastella e delle terre che questo fragello à percosse: la Cerra colle mura e con più case in terra; di Nola quel medesimo di più casali.

The third letter sent from Naples on 8 December 1456 was written by Giannozzo Manetti to the Florentine *Signoria*: Nola is included amongst places where the earthquake "has done a certain amount of damage, depending on the nature of the sites and the quality of the buildings; and a huge number of inhabitants have fled".

à fatti varii danni, secondo la varietà de' siti e lla qualità d'edificii, e grande e innistimabile 'vasione degli abitanti.

The fourth letter sent from Naples on 8 December 1456 was written by Giannozzo Manetti to Vespasiano da Bisticci: Nola is included amongst places where the earthquake "has struck to a greater or lesser extent, causing varying amounts of damage according to the vulnerability and position of the places concerned, for in some of the

above-mentioned villages it seriously damaged their walls, in others it demolished houses, and yet others collapsed into the ground, thereby killing many people”.

ha percosso variamente, et facto varij danni secondo la debolezza et sito de' luoghi, peroché a parte delle terre predecite ha frachassate le mura, a parte rovinato delle case et a parte sprofondatole con grande occisione di molte persone.

The fifth letter sent from Naples on 8 December 1456 was written by the Florentine merchant Paolo Rucellai to his brother Giovanni: Nola is included amongst places where the earthquake “has damaged” (*à dannegiato*). The report, very probably written at Naples on February 1457, was by Goro di Giovanni, a Florentine citizen: “The town of Nola, Salerno [...] all these towns and castles were badly affected by these earthquakes, and so were the churches and chapels within them and many *palazzi* and towers”.

La città di Nola, Salerno [...] tutte queste città e chastella furono per i detti tremuoti malamente perchose, e simile le chiese e oratori che dentro vi sono, e molti de li palagi e torri.

According to Manetti's treatise: “The important towns of Acerra, Marigliano and Nola survived [...] for they were not damaged at all by the earthquakes, or only slightly. [...] The very ancient town of Nola was not spared to that extent: amongst other things, some houses were damaged, but there were no victims”.

Acerre, Merelianum et Nola nobilitata opida restant, [...] presertim cum nulla vel pauca ex inde damna perceperint. [...] Nola urbe vetustissima huiusmodi damnorum expers evadere non potuit; nam inter alia quarundam edium confractionem sine ullis funeribus recognovit.

Nola is recorded in the following chronicles as being in ruins: the annals of Lorenzo Bonincontri and the French chronicle of Mathieu d'Escouchy.

Salerno

There was damage and no victims. The information provided by the letters paints a picture of more serious effects than those suggested by Manetti. The sources are eight letters and a report written between 6 December 1456 and February 1457, Manetti's treatise, two contemporary chronicles and Astesano's poem. The first letter sent from Naples on 6 December 1456 was written to duke Francesco Sforza by the Milanese ambassador, Antonio da Trezzo: “At [...] Salerno and many other towns and castles, the earthquake has done equally serious damage”.

Ad [...] Salerno et in molt'altre città et castelle è simelmente facto grande damno.

The second letter sent from Naples on 7 December 1456 was written by the Sienese ambassador, Bindo Bindi, to the authorities of the Sienese Republic: “at Salerno the earthquake has done a great deal of damage, and more than half the town walls have collapsed”.

ad Salerno facto grandissima ruyna; et più che la mità dele mure dela terra cascate.

The third letter sent from Naples on 8 December 1456 was written by Giannozzo Manetti to his brother Filippo: “What follows is an account of the castles and villages which have been struck by this scourge: [...] at Acerra the town walls and a number of houses are in ruins; [...] the same is true for Salerno [...]”.

Quello che seguirà sarà il significhato delle chastella e delle terre che questo fragello à percosse: la Cerra colle mura e con più casali in terra [...] di Salerno quel medesimo.

The fourth letter sent from Naples on 8 December 1456 was written by Giannozzo

Manetti to the Florentine *Signoria*: Salerno is included amongst places where the earthquake "has done a certain amount of damage, depending on the nature of the sites and the quality of the buildings; and a huge number of inhabitants have fled".

à fatti varii danni, secondo la varietà de' siti e lla qualità d'edificii, e grande e innistimabile 'vasione degli abitanti.

The fifth letter sent from Naples on 8 December 1456 was written by Giannozzo Manetti to Vespasiano da Bisticci: Salerno (*Salerna*) is included amongst places where the earthquake "has struck to a greater or lesser extent, causing varying amounts of damage according to the vulnerability and position of the places concerned, for in some of the above-mentioned villages it seriously damaged their walls, in others it demolished houses, and yet others collapsed into the ground, thereby killing many people".

ha percosso variamente, et facto varij danni secondo la debolezza et sito de' luoghi, peroché a parte delle terre predecite ha frachassate le mura, a parte rovinato delle case et a parte sprofondatole con grande occisione di molte persone.

The sixth letter sent from Naples on 8 December 1456 was written by the Florentine merchant Paolo Rucellai to his brother Giovanni: "Salerno and Cava have been badly damaged".

Salerno, la Chava ànno fatto molto danno.

The seventh letter sent from Foggia on 12 December 1456 to marquis Luigi III Gonzaga was written by the Mantuan ambassador: "They write from Salerno that (the earthquake) has caused damage there as well".

Da Salerno si scrive che ha pur fatto danno.

The sender and recipient of the eight letter, probably dating to January 1457, are unknown: "The town of Salerno was completely laid waste".

La città di Salerno fu guasta tutta quanta.

The report, very probably written at Naples on February 1457, was by Goro di Giovanni, a Florentine citizen: "The town of Nola, Salerno [...] all these towns and castles were badly affected by these earthquakes, and so were the churches and chapels within them and many *palazzi* and towers".

La città di Nola, Salerno [...] tutte queste città e chastella furono per i detti tremuoti malamente perchose, e simili le chiese e oratori che dentro vi sono, e molti de li palagi e torri.

According to Manetti: "Salerno, Cava dei Tirreni and that mountainous region that is commonly called the Costiera Amalfitana [...] suffered no damage, or very little [...] at Salerno [...] some houses were shaken, but there were no victims".

Salernum, Cava, et ea montana regio que Costa Amalfia vulgo appellatur [...] nulla vel pauca exinde detrimenta perceperunt [...]. Salernum [...] quarundam domorum concussione sine ullis funeribus recognovit.

Salerno is recorded in the following chronicles amongst places which partly collapsed and partly suffered damage: the French chronicle of Mathieu d'Escouchy and the *Notabilia temporum* of Angelo Tummolillo.

Sessa Aurunca (province of Caserta)

Suffered only slight damage. The sources are four letters of 8 December 1456, a report very probably written on February 1457, a *Notula* in the margin of codex 47 in the Archivio dell'Abbazia of Montecassino, Manetti's treatise, and one contemporary

chronicle. The first letter sent from Naples on 8 December 1456 was written by Giannozzo Manetti to his brother Filippo: "at Capua and all the surrounding towns as far as Sessa, the earthquake has done a great deal of damage".

a Chapua e a tutte le terre circhustantie in sino a Xexa à fatti danni assai.

The second letter sent from Naples on 8 December 1456 was written by Giannozzo Manetti to the Florentine *Signoria*: Sessa is included amongst places where the earthquake "has done a certain amount of damage, depending on the nature of the sites and the quality of the buildings; and a huge number of inhabitants have fled".

à fatti varii danni, secondo la varietà de' siti e lla qualità d'edificii, e grande e innistimabile 'vasione degli abitanti.

The third letter sent from Naples on 8 December 1456 was written by Giannozzo Manetti to Vespasiano da Bisticci: Sessa is included amongst places where the earthquake "has struck to a greater or lesser extent, causing varying amounts of damage according to the vulnerability and position of the places concerned, for in some of the above-mentioned villages it seriously damaged their walls, in others it demolished houses, and yet others collapsed into the ground, thereby killing many people".

ha percosso variamente, et facto varij danni secondo la debolezza et sito de' luoghi, peroché a parte delle terre predecite ha frachassate le mura, a parte rovinato delle case et a parte sprofondatole con grande occisione di molte persone.

The fourth letter sent from Naples on 8 December 1456 was written by the Florentine merchant Paolo Rucellai to his brother Giovanni: Sessa is included amongst places where the earthquake "has damaged" (*à danneggiato*). The report, very probably written at Naples on February 1457, was by Goro di Giovanni, a Florentine citizen: "The castle of Tiano, the castle of Sesti [Sessa Aurunca] [...]; all these towns and castles were badly affected by these earthquakes, and so were the churches and chapels within them and many *palazzi* and towers".

i chastelo di Tiano, i chastelo di Sesti [...]; tutte queste città e chastella furono per i detti tremuoti malamente perchose, e simile le chiese e oratori che dentro vi sono, e molti de li palagi e torri.

The *Notula*: "In truth, [...] Sessa [...], and in Abruzzo, castles, churches and villages suffered exceptional damage, with the result that in some villages or castles, only one house remained standing, and in others four, and in yet others ten, while in some places castles were submerged in raging waters".

Verum [...] Suesse [...] et in Aprutio castra, ecclesie, ville, mirabiliter ruerunt, sic ut in quibusdam locis vel castris sola domus remansit, alibi quatuor domus, ubi vero decem, nec non et alibi aquis rapiantibus castra submersa extiterunt.

According to Manetti's treatise: "Starting with Gaeta, then, we can say that it, together with Nola and Sessa Aurunca [...] felt these earthquakes (which spread throughout the countryside), but suffered only slight damage".

A Caieta itaque initium sumentes, eam ipsam cum Nola ac Suessam [...] eos ipsos terremotus cum paucorum damnorum susceptione, per universum agrum audivisse dicimus.

Sessa is recorded in the *Dietari* of Melchior Miralles as having been damaged.

Sora (province of Frosinone)

Some houses collapsed, while others remained standing. This was probably a case of effects varying within the urban area. The sources are Manetti's treatise and

Astesano's poem. According to Manetti: "Sora itself suffered similar damage [part collapsed and part remained standing]".

Sora ipsa horum detrimentorum expers fuit [partim lapsum partim vero conservatum].

Teano (province of Caserta)

Buildings were damaged. The sources are two letters of 8 December 1456 and two reports dating to January and February 1457, Manetti's treatise and one contemporary chronicle. The first letter sent from Naples on 8 December 1456 was written by Giannozzo Manetti to the Florentine *Signoria*: Teano (*Tiano*) is included amongst places where the earthquake "has done a certain amount of damage, depending on the nature of the sites and the quality of the buildings; and a huge number of inhabitants have fled".

à fatti varii danni, secondo la varietà de' siti e lla qualità d'edificii, e grande e innistimabile 'vasione degli abitanti.

The second letter sent from Naples on 8 December 1456 was written by the Florentine merchant Paolo Rucellai to his brother Giovanni: "[At] Teano [...] [the earthquake] has done a great deal of damage".

Tiano [...] fatto danno assai.

The first report of unknown authorship, probably dates to January 1457, was sent to cardinal Prospero Colonna: Teano (*Tiano*) is included in a list of places struck by the earthquake, but for which the writer does not specify the effects. The second report, very probably written at Naples on February 1457, was by Goro di Giovanni, a Florentine citizen: "The castle of Tiano [...] all these towns and castles were badly affected by these earthquakes, and so were the churches and chapels within them and many *palazzi* and towers".

i chastelo di Tiano [...] tutte queste città e chastella furono per i detti tremuoti malamente perchose, e simile le chiese e oratori che dentro vi sono, e molti de li palagi e torri.

According to Manetti's treatise: "Starting with Gaeta, then, we can say that it, together with Nola and Sessa Aurunca [...] and also Teano [...] felt these earthquakes (which spread throughout the countryside), but suffered only slight damage".

A Caieta itaque initium sumentes, eam ipsam cum Nola ac Suessam [...] et Theanum quoque [...] eos ipsos terremotus, cum paucorum damnorum susceptione, per universum agrum audivisse dicimus.

Teano is recorded in the *Notabilia temporum* of Angelo Tummolillo amongst places which partly collapsed and were partly damaged.

Zungoli (province of Avellino)

Damage was not massive, but there must have been some damage, since a number of people were probably killed; for Manetti places effects here at the same level as at Corsano, where there were about twenty victims. The sources are Manetti's treatise and Pierozzi's chronicle. According to Manetti: "Corsano suffered a little damage, and about twenty people were killed there. We are aware that Zungoli too suffered an equal amount of damage".

Cursanum parva quedam, cum ruinarum tum personarum circiter viginti, detrimenta cognovit. Zuncolium eadem pariter damna perpessum fuisse non dubitamus.

In Pierozzi's chronicle, Zungoli (*Iuncule*) is included amongst the places which "have suffered substantial damage in the earthquakes [...] Of the places listed which did not suffer serious damage, we do not have the number of victims".

notabile detrimentum receperunt ex ipsis terremotibus [...] non tantam ruinam passerunt, numerus defunctorum non habetur descriptus.

Castellammare di Stabia (province of Naples)

There was little damage here. A fissure opened up in the ground nearby, and gaseous exhalations poured out. The sources are two letters of December 1456. The first letter, sent from Naples on 8 December 1456 was written by the Florentine merchant Paolo Rucellai to his brother Giovanni: "Castellammare [di Stabia] has not been much damaged".

Castello a Mare non à ricevuto molto danno.

The second letter, sent from Foggia on 12 December 1456, was written to marquis Luigi III Gonzaga by the Mantuan ambassador: "not far from Castellammare [di Stabia] the ground opened up and a kind of lake was formed, which gave off an amazingly powerful stench".

poco lonzo dal Castello a Mare è aperta la terra e fatta in modo de uno lago, con tanto fetore che è una maraviglia.

Bari

The church of S.Nicola was badly damaged and shored up with a large number of beams. 250 ducats were earmarked for essential repairs to the building: two transverse arches to be built, one in the middle of the nave, and the other between the first columns nearest the main church door, known as "the royal door". The sources are Manetti's treatise and a notarial deed drawn up at Bari on 11 April 1458 (published in Idra and Speranza 1991, no.52, pp.182-6) which provides a detailed description of earthquake effects, suggesting that they were more substantial than appears from Manetti's treatise. In Manetti's treatise, Bari is listed among localities "which suffered slight or no damage".

que vel nulla vel levia detrimenta perceperunt.

In the notarial deed we read: "In the year 1458 [...] in the month of April, on the 11th day of that month, in the 6th indiction, in the above-mentioned city of Bari, in the public street outside the cloister of the famous and celebrated church of the great St.Nicholas of Bari [...] in the name of and on behalf of the said church and of the whole chapter for the other party, both the said parties in total agreement and with one identical decision assert before us that [...] during the past year of the 5th indiction, within the said famous church, where all had gathered and collected to see the great destruction brought about in those same days at that church by the great earthquake tremor, as a result of which the said church could be seen and still can be seen to be badly damaged, and was and still is in danger of collapse, and would indeed have completely collapsed if it had not been hurriedly supported with a large number of beams, and since for this reason the whole population and the said persons, men and women alike, wish to offer their assistance towards the repair of the said church [...] they offered and promised with great piety to contribute to the said church and to pay 200 ducats towards the repair of the fabric [...]. And so the restoration of the said church was begun and a large transverse arch was completed in the middle of the nave on behalf of and at the expense of the church itself, that is to say its prior and chapter, for it subsequently became necessary to make another similar transverse arch between the first columns nearest the main door of the said church, which door is commonly known as 'the royal door' [...] the said population [...] when the master builders designated to build the said arch were summoned, a contract was drawn up and agreed with them for constructing the said arch between the said columns near-

est the main door of the said church as stated above, all expenses to be paid by the said master builders, for 250 ducats”.

anno millesimo quatercentesimo quinquagesimo octavo [...] mense aprilis, die undecimo eiusdem, sexte indictionis, in civitate predicta Bari, in via publica extra claustrum celebris et famosissime ecclesie magni Sancti Nicolai Barensis [...] nomine et pro parte ecclesie predictae ac totius capituli eiusdem ex parte altera, dicte ambe partes concorditer et pari voto asseruerunt coram nobis quod [...] infra annum quinte indictionis proxime elapsam, intus in dicta celebri ecclesia, ad quam confluxerant et concurrerant omnes causa videndi magnam concussionem illismet diebus eidem ecclesie factam magno impetu terremotus, quo dicta ecclesia cernebatur et adhuc cernitur conquassata et magnam minabatur prout etiam adhuc minatur ruynam et certe in ultimam dirutionem corruisset nisi acceleratissimi multarum trabium sustentationibus fuisset adiuta volentesque propterea eadem universitates et homines predicti sese adiutrices et adiutores prebere reparationi dicte ecclesie [...] obtulerunt generaliter et promiserunt magna cum devotione se soluturos et collaturas dicte ecclesie et reparationi eius fabrice ducatus ducentum [...]. Deinde vero data opera ad reparationem dicte ecclesie et perfecto quodam arcu magno in medio navis ecclesie prefate ex transverso sumptibus et expensis ecclesie eiusdem seu dicti eius prioris et capituli, cum oporteret successive facere alium arcum similiter ex transverso infra primas columpnas proximas ianue maiori affate ecclesie, que ianua vulgariter dicitur ab omnibus la porta regale [...] dicte universitates [...] convocatis magistris preparatis ad constructionem dicti arcus, convenerunt et pacte fuerunt cum eis pro constructione predicti arcus infra dictas columpnas proximas ianue maiori dicte ecclesie ut supra ad omnes expensas dictorum magistrorum pro ducatis ducentum quinquaginta.

Montecassino (province of Frosinone)

Plaster fell in the church, lamps swayed violently, and bells rang. Numerous cracks appeared in the monastery buildings. The sources are a *Notula* written in the margin of codex 47 in the archives of the abbey of Montecassino and a contemporary chronicle.

The text of the *Notula* is as follows: “while the Cassino convent was carrying out the divine office of matins in accordance with Church custom, at about the third hour of the night before the day, when the prior had prayed for blessing for the twelfth reading of the said matins, there was suddenly a terrible and violent earthquake. At the time, we were all celebrating matins in the Cassino church and thought the end of our lives had come. For the walls of the church, where we were giving praise to God, began to throw pieces of plaster at us in a prodigious and terrible way because of an earthquake, while the lamps below the crucifix were thrown in all directions. The bells rang, without the application of human force, but although numerous cracks appeared in monastery buildings, nevertheless, because of God’s appreciation of the merits of the most holy father Benedict, everybody and all the buildings survived”.

cum conventus casinensis instaret divinis laudibus matutinas persolvere, juxta morem Ecclesie, circa tertiam horam ante diem, in nocte, cum prior petiisset benedictionem pro duodecima lectione dicti matutini, subito terremotus terribilis et fortis factus est. Quo omnes quotquot in ecclesia casinensi matutinum celebramus sine vite expectabamus. Nam muri dicte ecclesie, ubi Deo laudes persolvebamus, propter terremotus calcem mirabiliter ac terribiliter ceperunt super nos proicere, lampades sub crucifixo jactabantur hinc et inde, campane absque vi humana mirabiliter pulsabant. Set licet scissure plures in edificiis monasterii remanserint.

Montecassino is recorded in the *Notabilia temporum* of Angelo Tummolillo, a local chronicler, as a place which did not suffer damage.

Tsunami

Tsunami effects are recorded as having occurred in the Bay of Naples. During the night of 4-5 December, when "calm weather" conditions prevailed, the sea became very rough and all the boats anchored in the port struck against one another very dangerously, and one small boat completely broke up, thereby losing the merchandise on board; but there were no victims.

The source which reports these effects is a letter written in Naples on 7 December 1456 by the Sienese ambassador, Bindo Bindi to the authorities of the Sienese Republic:

"During the night [of 4-5 December], the sea became so rough that all the galleys and ships in port seemed to be fought over by a thousand devils, so heavily did they strike against one another, and so those who were on board thought they were in danger. One small boat completely broke up, but by the grace of God no-one was killed, though its cargo was lost.

Fo in la nocte sì grande commocione nel mare, che tute le galee et nave che erano in porto parevano che fosseno combatute da milli diavoli, sì grande ruyna et percussione fra loro facevano, che chi ce era suso credete pericolare; cum certa sattia piccola però tutta se aperse et gratia de Dio non gli peri persona se non robba.

Environmental effects (by localities, based only on primary sources)

Set out below are the texts, arranged by locality, in which effects on the natural environment are recorded.

Bojano (province of Campobasso)

This locality was completely flooded, probably as a result of the blocking of the river Biferno by a landslide.

The sources are Manetti's treatise and Pierozzi's chronicle. According to Manetti: "Boviano is an ancient and once wealthy town, now called Buiano [Bojano] for reasons of euphony. Not only did the town and its castle completely collapse but, more surprisingly, it was completely submerged by the waters which surrounded it on every side, and it mourned more than one thousand two hundred dead. [...] recently so cruelly swallowed up into an abyss in the earth".

Bovianum vetusta olim et opulenta urbs, nunc autem euphorie causa Buianum nuncupata, non solum cum arce sua penitus corruit, sed quod etiam mirabilis est, totum aquis undique circumdantibus obrutum, ultra ducentos supra mille mortales desideravit. [...] ita crudeliter hiatu terre nuper absorto.

According to the chronicle of Pierozzi: "After the town of Bojano collapsed, it was submerged by the waters which rose out of the ground because of the earthquake, and 1,300 people spent their last day there".

Civitas Buiani post ruinam submersa est aquis surgentibus ex terra per terremotum, MCCC extremum diem claudentibus ibi.

Castel di Sangro (province of L'Aquila)

This locality was struck by a landslide from the mountain which overlooks the village. The sources are Manetti's treatise and Pierozzi's chronicle.

Manetti writes: "Sarno [in fact Castel di Sangro] takes its name from the river or mountain of that name, at the foot of which it stood. When the mountain, which overlooks the village, collapsed on to a large part of it, about seventy people were crushed to death".

Sarnum, vel à fluvio vel a monte eiusdem nonimis in cuius radicibus situm erat appellatum, ad ruinam predicti montis qui illi imminebat super magnam opidi

partem collapsi, septuaginta circiter personas propria sue portionis obtritione interemit.

According to Pierozzi: "At the castle of San Iuhino [Castel di Sangro], the hill which overlooks it collapsed on to it, burying it together with 44 of its inhabitants".

Castellum sancti Iuhini montaneta que ei imminebat cecidit super illud, cooperiens ipsum, et XLIV homines eius.

Fornelli (province of Isernia)

The fissures and cracks on the hill on which the village stands are reported in an letter of unknown authorship, probably dating to January 1457:

"At the castle called Fravelle [Fornelli] the houses are in ruins, and so are the village walls, and the hill on which the village stands has strangely split open in several places".

Il castello detto Fravelle le case tutte guaste, e il muro di cinta pure, ed il monte del medesimo castello stranamente e in più luoghi spaccato.

Cassino [formerly San Germano] (province of Frosinone)

The water in springs became cloudy for three or four days after the earthquake of 5 December, and for two days after the earthquake of 30 December.

The source is the chronicle of the notary Angelo Tummolillo (*Notabilia temporum*), who experienced the earthquake himself:

"And during the first earthquake [5 December] the earth was shaken to the depths and all water came forth as cloudy as faeces for three or four days. Similarly, on Thursday 23 [30] of that same month of December, towards the third hour of the day, there was another substantial earth movement, which caused cloudy water to flow out for two days".

et in primo terremoto motus est terre abissus et omnes aque scaturizabant turbide velut feces usque ad tres vel quatuor dies. et similiter die iouis .XXIII. dicti mensis decembris hora quasi tertia diei fuit alius arduus terremoto, ex quo etiam fluxerunt aque turbide per duos dies.

Naples

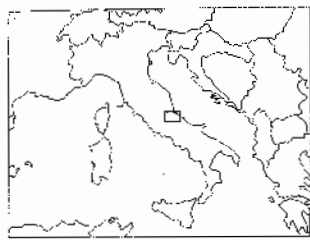
In addition to the above-mentioned tsunamis, there was another phenomenon: the water in wells and cisterns became so disturbed that it overflowed. The source is the letter written in Naples on 7 December 1456 by the Siense ambassador, Bindo Bindi to the authorities of the Siense Republic: "The water in the wells and cisterns in Naples was so disturbed that it spilled out.

L'aque de pozzi et dele cisterne sono in Napoli era sì grande la tempesta gli era dentro che spingeva l'acqua de fuora.

Castellammare di Stabia (province of Naples)

The "stink" referred to was probably caused by exhalations of hydrogen sulphide. The source is a letter written at Foggia on 12 December 1456 to Luigi III Gonzaga, marquis of Mantua, by the Mantuan ambassador at Naples: "not far from Castellammare [di Stabia] the earth opened up and became like a lake, and there was an amazingly unpleasant stink".

poco lonzo dal Castello a Mare è aperta la terra e fatta in modo de uno lago, con tanto fetore che è una meraviglia.



1456
December 5

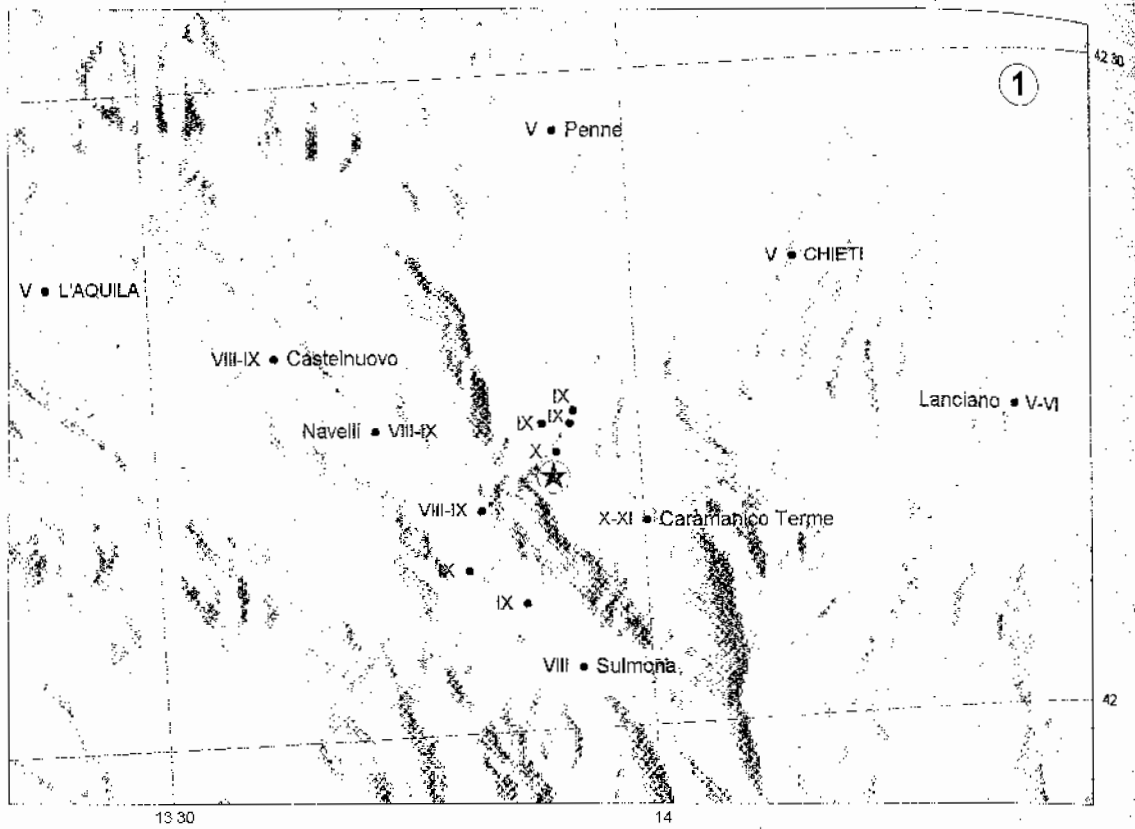


fig. 124

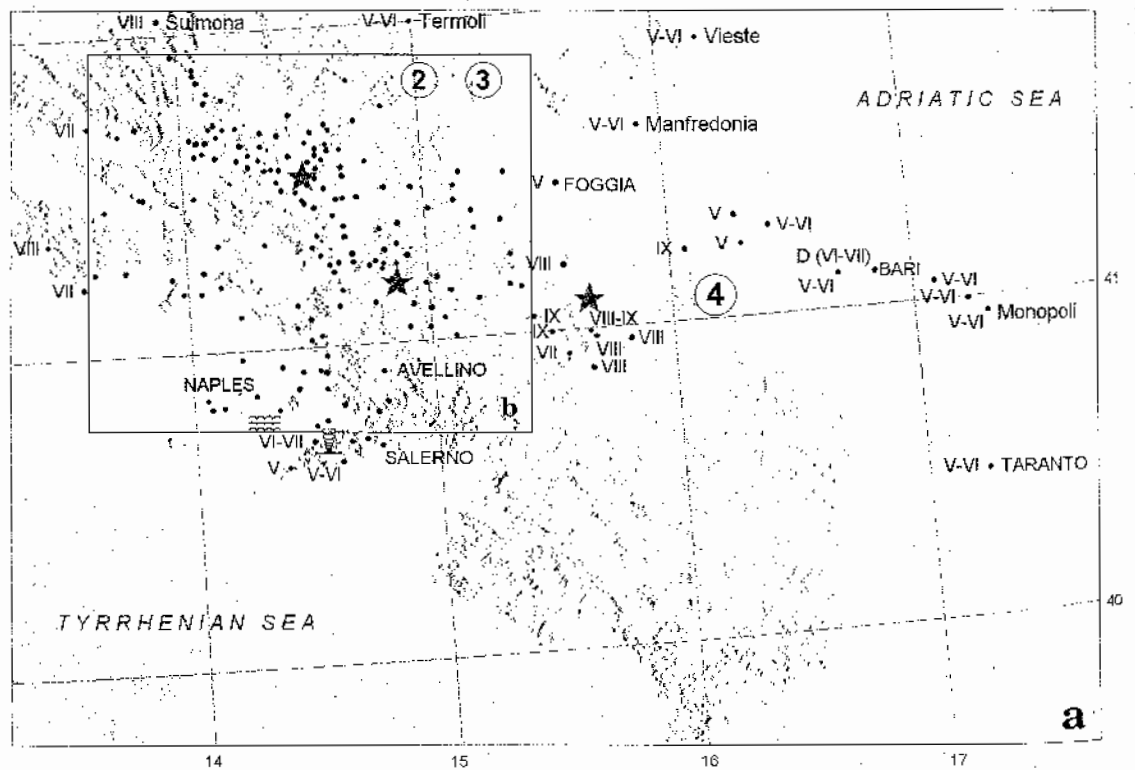


fig. 125a

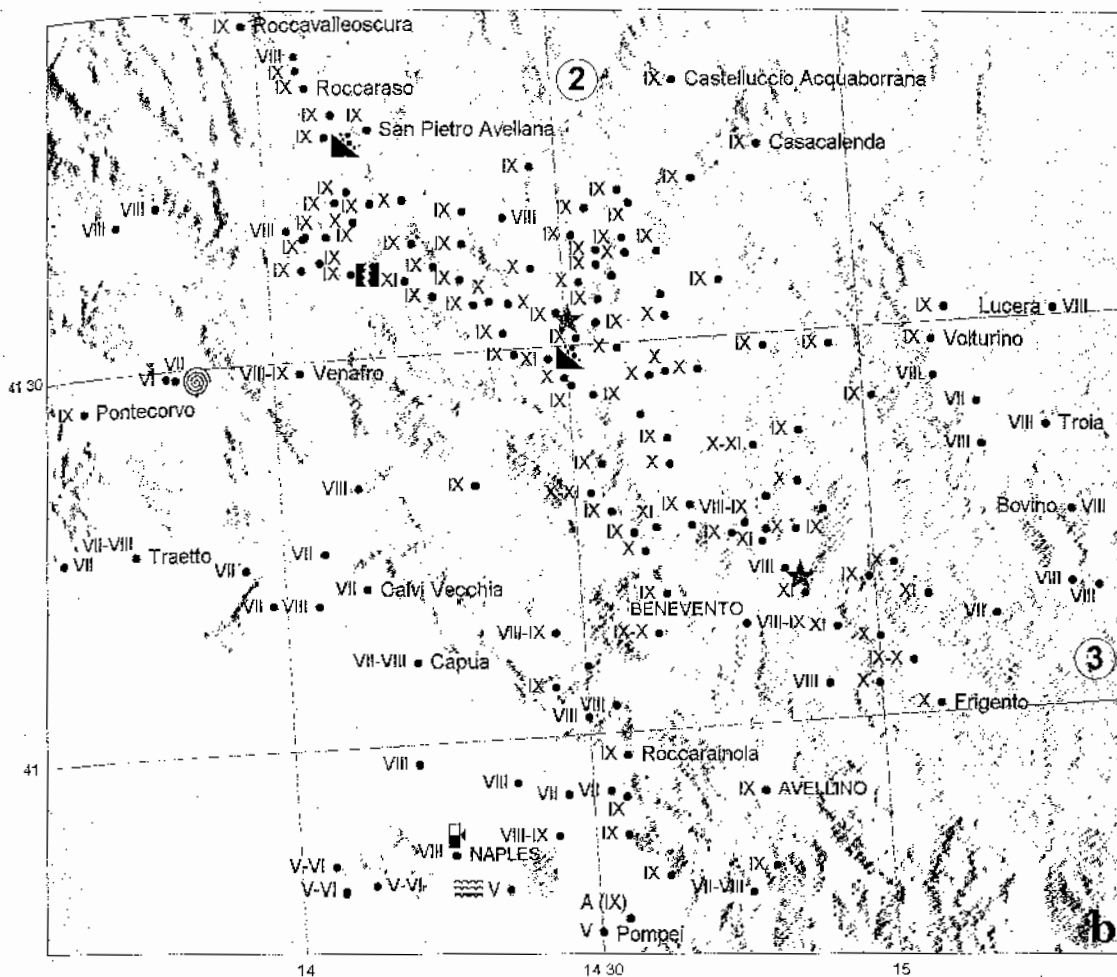


fig. 125b

▲ 1456 12 05 3:00 UT ★ = 42 12 13 55 I₀ = X Me = 5.8 Sites: 17

localities	lat.	long.	I	localities	lat.	long.	I
Caramanico Terme	42 09	14 00	X-XI	Popoli	42 10	13 50	VIII-IX
Tocco da Casauria	42 13	13 55	X	Sulmona	42 03	13 56	VIII
Castiglione a Casauria	42 14	13 54	IX	Lanciano	42 14	14 23	V-VI
Pratola Peligna	42 06	13 52	IX	Chieti	42 21	14 10	V
S. Clemente a Casauria	42 14	13 56	IX	L'Aquila	42 21	13 24	V
Torre de' Passeri	42 15	13 56	IX	Penne	42 27	13 56	V
Vittorito	42 07	13 49	IX	Rome	41 54	12 29	IV
Castelnuovo	42 18	13 38	VIII-IX	Recanati	43 24	13 33	II
Navelli	42 14	13 44	VIII-IX				

1456 12 05 3:00 UT ★ = 41 32 14 30 I₀ = XI Me = 7.0 Sites: 89 EE: 4

1456 12 05 3:00 UT ★ = 41 11 14 52 I₀ = XI Me = 7.0 Sites: 82 EE: 2 Ts

1456 12 05 3:00 UT ★ = 41 05 15 40 I₀ = IX Me = 6.3 Sites: 18

AREA ①

AREA ②

AREA ③

AREA ④

hyp. area = hypothetical area of the seismic sources

hyp. area	localities	lat.	long.	I	hyp. area	localities	lat.	long.	I
3	Apice	41 07	14 56	XI	2	Isernia	41 36	14 14	XI
3	Ariano Irpino	41 09	15 05	XI	3	Paduli	41 10	14 53	XI
2	Bojano	41 29	14 28	XI EE	3	Pescocostanzo	41 14	14 49	XI



hyp. area	localities	lat.	long.	I	hyp. area	localities	lat.	long.	I
3	San Lupo	41 16	14 38	XI	3	Durazzano	41 04	14 27	IX
3	Circello	41 21	14 48	X-XI	2	Forli del Sannio	41 42	14 11	IX
2	Civitella Licinio	41 19	14 32	X-XI	2	Fornelli	41 36	14 08	IX EE
2	Acquaviva d'Isernia	41 40	14 09	X	2	Fossalto	41 40	14 33	IX
3	Bonito	41 06	15 00	X	3	Fragneto Monforte	41 15	14 46	IX
2	Casalciprano	41 35	14 32	X	2	Guardiaregia	41 26	14 33	IX
3	Casalduni	41 16	14 42	X	3	Guardia Sanframondi	41 15	14 36	IX
2	Cercomaggiore	41 28	14 43	X	4	Lacedonia	41 03	15 25	IX
2	Cercepiccola	41 28	14 40	X	2	Limosano	41 40	14 37	IX
2	Ferrazzano	41 32	14 40	X	2	Miranda	41 38	14 15	IX
3	Frigento	41 01	15 06	X	3	Montecalvo Irpino	41 12	15 02	IX
2	Frosolone	41 36	14 27	X	3	Montecorvino	41 31	15 09	IX
3	Limata	41 14	14 37	X	3	Montoro Superiore	40 49	14 48	IX
2	Macchiagodena	41 33	14 24	X	2	Oratino	41 35	14 35	IX
3	Mirabella Eclano	41 03	15 00	X	3	Pago Veiano	41 15	14 52	IX
3	Monteleone	41 15	14 49	X	3	Palma Campania	40 52	14 33	IX
3	Morcone	41 20	14 40	X	2	Pesche	41 37	14 17	IX
2	Roccasicura	41 42	14 14	X	2	Pescolanciano	41 41	14 20	IX
3	San Giorgio la Molara	41 16	14 55	X	2	Pottoranello del Molise	41 34	14 17	IX
2	S.Giuliano del Sannio	41 27	14 38	X	2	Pietraroja	41 21	14 33	IX
3	San Marco dei Cavoti	41 18	14 53	X	2	Pontecorvo	41 27	13 40	IX
2	San Polomatese	41 28	14 30	X	3	Pontelandolfo	41 17	14 42	IX
2	Sant'Angelo in Grotte	41 34	14 22	X	3	Reino	41 17	14 49	IX
2	Santo Stefano	41 37	14 37	X	2	Riccìa	41 29	14 50	IX
2	Vinchiaturò	41 30	14 35	X	2	Rionero Sannitico	41 43	14 08	IX
3	Grottaminarda	41 04	15 03	IX-X	2	Ripalimosani	41 37	14 40	VIII
3	Tocco Caudio	41 07	14 38	IX-X	2	Rivisondoli	41 52	14 04	IX
3	S.Maria di Realvalle	40 46	14 33	A (IX)	2	Roccacinquemiglia	41 49	14 07	IX
2	Alife	41 20	14 20	IX	2	Roccapia	41 56	13 59	IX
4	Aquilonia Vecchia	41 00	15 30	IX	3	Roccarainola	40 58	14 34	IX
3	Avellino	40 55	14 47	IX	2	Roccaraso	41 51	14 05	IX
2	Baranello	41 32	14 33	IX	2	Roccapromonte	41 36	14 34	IX
2	Busso	41 33	14 34	IX	2	Rocchetta a Volturno	41 37	14 05	IX
2	Campobasso	41 33	14 40	IX	3	S.Bartolomeo in Galdo	41 25	15 01	IX
2	Campochiaro	41 27	14 30	IX	2	San Massimo	41 30	14 25	IX
4	Canosa di Puglia	41 13	16 04	IX	2	San Pietro Avellana	41 47	14 11	IX
2	Cantalupo nel Sannio	41 31	14 24	IX	3	S.Maria Galdo Mazz.	41 22	14 53	IX
2	Carpinone	41 36	14 19	IX	2	Sant'Angelo Limosano	41 42	14 36	IX
2	Casacalenda	41 44	14 51	IX	3	Sarno	40 49	14 37	IX
3	Castelcicala	40 55	14 33	IX	2	Sassinoro	41 22	14 40	IX
2	Castel di Sangro	41 47	14 06	IX EE	2	Scapoli	41 37	14 03	IX
2	Castel San Vincenzo	41 39	14 04	IX	2	Sepino	41 24	14 37	IX
2	Castellino del Biferno	41 42	14 44	IX	2	Sessano del Molise	41 38	14 20	IX
2	Castellone al Volturno	41 39	14 04	IX	2	Spina	41 42	14 07	IX
2	Castelmauro	41 50	14 43	IX	2	Spinete	41 33	14 29	IX
2	Castelpetroso	41 34	14 21	IX	2	Sprondasino	41 44	14 27	IX
2	Castropignano	41 37	14 34	IX	2	Torella del Sannio	41 38	14 31	IX
3	Correto Sannita	41 17	14 34	IX	2	Toro	41 34	14 46	IX
2	Cerro al Volturno	41 39	14 06	IX	3	Tufara	41 29	14 57	IX
2	Colle d'Anchise	41 31	14 31	IX	3	Vitulano	41 10	14 39	IX
3	Corsano	41 11	14 59	IX	3	Volturno	41 29	15 07	IX
2	Covatta	41 38	14 36	IX	3	Benevento	41 08	14 47	VIII-IX

hyp. area	localities	lat.	long.	I	hyp. area	localities	lat.	long.	I
3	Dugenta	41 08	14 27	VIII-IX	2	Formia	41 16	13 37	VII
3	Fragneto l'Abate	41 16	14 47	VIII-IX	2	Gaeta	41 13	13 34	VII
4	Melfi	41 00	15 39	VIII-IX	3	Marigliano	40 55	14 27	VII
3	Sant'Agata de' Goti	41 05	14 30	VIII-IX	4	Monticchio	40 56	15 33	VII
3	Somma Vesuviana	40 52	14 26	VIII-IX	3	Nola	40 56	14 32	VII
2	Venafro	41 29	14 03	VIII-IX	3	Salerno	40 41	14 46	VII
3	Accadia	41 09	15 20	VIII	2	Sessa Aurunca	41 14	13 56	VII
3	Acerra	40 57	14 22	VIII	2	Sora	41 43	13 37	VII
3	Alberona	41 26	15 07	VIII	2	Teano	41 15	14 04	VII
2	Alvito	41 41	13 45	VIII	3	Zungoli	41 07	15 12	VII
3	Arienza	41 01	14 30	VIII	3	Castellammare d.Stab.	40 42	14 29	VI-VII EE
3	Arpaia	41 02	14 33	VIII	4	Bari	41 06	16 51	D (VI-VII)
4	Ascoli Satriano	41 12	15 34	VIII	2	Montecassino	41 29	13 49	VI
4	Atella	40 53	15 39	VIII	3	Amalfi	40 38	14 36	V-VI
3	Aversa	40 58	14 12	VIII	3	Baia	40 49	14 04	V-VI
3	Bovino	41 15	15 21	VIII	4	Bitonto	41 06	16 41	V-VI
3	Castelluccio Valmagg.	41 20	15 12	VIII	3	Brindisi	40 38	17 57	V-VI
2	Civitanova del Sannio	41 40	14 24	VIII	3	Cava de' Tirreni	40 42	14 42	V-VI
2	Fondi	41 21	13 26	VIII	3	Cuma	40 51	14 03	V-VI
2	Francolise	41 11	14 03	VIII	3	Lecce	40 21	18 10	V-VI
3	Lucera	41 30	15 20	VIII	3	Manfredonia	41 37	15 54	V-VI
3	Naples	40 51	14 16	VIII EE Ts	4	Mola di Bari	41 03	17 05	V-VI
2	Pescocostanzo	41 53	14 04	VIII	4	Monopoli	40 57	17 18	V-VI
3	Pietrelcina	41 12	14 51	VIII	4	Polignano a Mare	41 00	17 13	V-VI
2	Pizzone	41 40	14 02	VIII	3	Pozzuoli	40 49	14 07	V-VI
4	Rapolla	40 58	15 40	VIII	3	Taranto	40 27	17 15	V-VI
2	S.Donato Val d.Comino	41 42	13 49	VIII	2	Termoli	42 00	15 00	V-VI
3	Sant'Agata di Puglia	41 09	15 23	VIII	4	Trani	41 17	16 25	V-VI
3	Tramonti	40 42	14 38	VIII	2	Vasto	42 07	14 42	V-VI
3	Troia	41 22	15 19	VIII	3	Vieste	41 53	16 11	V-VI
2	Vairano Patenora	41 20	14 08	VIII	4	Andria	41 14	16 18	V
4	Venosa	40 58	15 49	VIII	4	Barletta	41 19	16 17	V
3	Venticano	41 03	14 55	VIII	3	Cosenza	39 18	16 15	V
2	Capua	41 06	14 13	VII-VIII	3	Crotone	39 05	17 08	V
3	Mercato San Severino	40 47	14 46	VII-VIII	3	Ercolano	40 48	14 21	V
2	Minturno	41 16	13 45	VII-VIII	4	Foggia	41 28	15 33	V
3	Biccari	41 24	15 12	VII	3	Pompei	40 45	14 30	V
2	Calvi Vecchia	41 12	14 08	VII	3	Sorrento	40 37	14 23	V
2	Carinola	41 11	13 59	VII	3	Messina	38 11	15 33	III
2	Cassino	41 29	13 50	VII EE					

1456 12 07 21:05 UT

localities	lat.	long.	I
Naples	40 51	14 16	III-IV

1456 12 21-22

localities	lat.	long.	I
Naples	40 51	14 16	F

1456 12 30 8:20 UT Sites:2 EE: 1

localities	lat.	long.	I	localities	lat.	long.	I
Naples	40 51	14 16	VII	Cassino	41 29	13 50	VII EE

1457 01 8-9

localities	lat.	long.	I
Naples	40 51	14 16	VI

1457 02 10-11

localities	lat.	long.	I	localities	lat.	long.	I
Capua	41 06	14 13	VI-VII	Naples	40 51	14 16	F

< 319 > **1457 April 23 Erzinka [eastern Turkey] ▷ streams overflow ◁**

sources 1 *Chron. min. Arm.*, II.7, p.212; colophon in Hakobyan (1956, p.215, no.26); colophon in Xac'ikyan (1958, II, p.256a, p.211); *Chron. min. Arm.*, II.11, p.265; I.11, p.168; II.15, p.393; al-Suyuti, *Kashf*, p.58

sources 2 *Notula in Chron. min. Arm.*, I.27, p.392, no.5; *Chron. min. Arm.*, II.4; II.12, p.284; II.13, p.355; Ar. Tabr., *Book*, p.473

historiography Kostaneanc' (1902); Hakobyan (1956); Sanjian (1969); Zeyt'unyan (1991)

literature Abich (1882); Taher (1979)

catalogues d. Grumel (1958); Step'anyan (1964)

catalogues p. Ergin *et al.* (1967); Ben-Menahem (1979)

On 23 April 1457 at about 3:30 UT ("the first hour of the day"), a strong earthquake caused the almost total destruction of Erzinka (now Erzincan, in present-day eastern Turkey). There were 12,000 victims. Half the citadel of Keli collapsed. It may well be that the earthquake burst open the banks of the river which flows through Erzincan, for the chronicle of the scribe David of Merdin refers to a "flood" after the earthquake. The sources for the earthquake are the short chronicle of David of Merdin (*Chron. min. Arm.*, II.7, p.212, cf. Sanjian 1969, pp.220-4), and a colophon recorded in Hakobyan (1956, p.215, no.26). David of Merdin's chronicle records at the year 906 of the Armenian era, which corresponds to the period 27 November 1456 - 26 November 1457:

"In this year an earthquake occurred and half the citadel of Keli collapsed; and the city of Eznkay was destroyed and flooded".

Ի սմին ամի եղև շարժ և բլաւ Կելոյ կէս բերդին և եզնկայ քառար տապալեցաւ և շրահեղձ եղաւ .

The colophon provides chronological data of the earthquake, as well as more detailed information about effects at Erzincan, but without reference to environmental phenomena:

"And then, in those days, a terrible earthquake occurred at Eznkay, destroying the city and reducing all the walls to ruins, and at that time, 12,000 people perished in the earthquake, believers and unbelievers, young and old, and pious priests; and we cannot measure the sorrow, affliction, tears and sighs caused by their death. We were the eye-witnesses of a tremendous punishment, when the Creator, the only God, visited calamity and despair on his servants. It happened in the year 906 [27 November 1456 - 26 November 1457], on 23 April, the first Saturday after Easter, at the first hour of the day".

Եւ դարձեալ ի սոյն աւուրս եղև ահագին շարժ Յեզնկայն և կործանեաց զքառարն և զբոլոր պարիսպն յատակէն տապալեաց և մեռան ի նմին ժամու ի շարժէն անձինք Բժ հազար հաւատացեալ և անհայտ, ծեր և տղայ և սրբասնեալ քահանայք, զոր ոչ կարեմք գաղեսու և գկսկիծ և զկոծ և զհառաչ նոցա թուել, զի ականատես եղար ահագին սլառուհասին, զոր արարիչն Աստուած մի ցուցցլ ճառայք իւրոց այնպիսի

ժողովուրդի ի վիշտ... և յայսմ ամի էր թուական Զ և Զ անպիլ ամսոյ ԻԳ, յառուր շաբաթու, կրկնազատկին, ի չորրորդ ժամու ցերեկին.

There is a briefer report in a colophon dating to 1464 and signed by the scribe Step'anos. It surveys the calamities of the preceding years, and dates the earthquake to five years after the fall of Constantinople (1458).

Gregory of Kamakh (*Chron. min. Arm.*, II.11) refers only briefly to the destruction, adding, however, that there were 32,000 victims. 32,000 victims are also reported both by Vartan of Balesh (*Chron. min. Arm.*, II.15), who adds that it was the most violent earthquake in the history of the city, and by a 17th century Armenian chronicle (*Chron. min. Arm.*, II.12). There is a report of 30,000 victims, but with an erroneous reference to the year 1463, in the 17th century chronicle of David of Balesh (*Chron. min. Arm.*, II.13).

Arakel of Tabriz gives the date as 907 (27 November 1457 – 26 November 1458), and seems to be responsible for the opinion of Ergin *et al.* (1967, p.18, no.178), who date the event to 1458. What is known as the *Annals of the Anonymous of Sivas* (*Chron. min. Arm.*, II.4) contains a brief report of an earthquake at Erzincan with 12,000 victims, but dates it to 917 (25 November 1467 – 23 November 1468). Since no other information is provided, it would seem to be simply a chronological error.

The earthquake is also mentioned briefly in one Arabic source, al-Suyuti: "[861 H. = 29 November 1456 – 18 November 1457]. A terrible earthquake destroyed most of Arzankan, including its walls and towers. One hundred people died".

كانت زلزلة عظيمة بأرزكان هدمت معظمها وسورها وأبراجها وماتت مائة نفس.

localities	lat.	long.	I	localities	lat.	long.	I
Erzincan	39 44	39 30	X EE	Keli	39 21	40 21	IX

< 320 > 1458 April 25 Città di Castello [central Italy]

< 321 > 1458 April 26 Upper Tiberina Valley ▷ fissures ◁

< 322 > 1458 April 29-30 Città di Castello

< 323 > 1458 May 1 Città di Castello

sources 1 [manuscripts] ASCCittà di Castello, *Riformanze*, reg.46, 26 April, 1 May, 7 May, 25 August 1458; ASCSansepolcro, II, *Riforme, Provisioni e deliberazioni dei consigli*, reg.4, fol.2v, 7 October 1458; fol.38r., 24 January 1459; BRiccMor, Florence, *Mss. Riccardiani*, 1030, *Ricordi*, fol.8v.

Petition, 4 December 1461, in degli Azzi (1914, p.107, no.57); Guerr. Gubbio, *Chron.*, p.66; *Ann. Foroliv.*, p.97; *Cron. Ramp.*, IV, pp.252-3; *Cron. Varign.*, IV, pp.252-3; Fecini, *Cron.*, p.868; *Cron. latina*, pp.47-8

sources 2 BCSanssepulcro, J.107, Bercordati, *Cron.*, fol.49v.; BCABo, B.2355, Bianchetti, *Ann.*, fol.614; *Mss. Malvezzi*, 59-63, Bianchetti, *Ann.*, II, fols.39-40; *Cron. di Gubbio*, p.105; *Cron. città di Perugia*, p.632; Pellini, *Dell'hist.*, II, p.643

historiography Bonazzi (1875-79); Coleschi (1984); Leonardi (1984); Agnoletti (1986)

literature Castelli and Moriani (1990); Castelli and Monachesi (1996); Castelli *et al.* (1997)

catalogues d. Perrey (1848); Mallet (1853); Mercalli (1883); De Rossi (1889); Baratta (1899, 1901); Conversini *et al.* (1990); *Boschi *et al.* (1995, 1997, 2000)

catalogues p. Giorgetti and Iaccarino (1971); Carrozzo *et al.* (1973); Postpischl (1985); CPTI (1999)

Effects of the earthquakes

- April 25 During the day and night of 25 April, a number of earthquakes were felt at Città di Castello before the main shock.
- April 26 On 26 April at about 12:15 UT (halfway through the seventeenth hour, "Italian time"), there was a destructive earthquake in the upper Tiber valley (Tiberina Valley). The area in question was not very extensive, but is of substantial interest in terms of the landed property involved. About a third of Città di Castello was destroyed, especially the district of S.Egidio; about 180-400 houses collapsed and almost all the rest were damaged. The church of S.Francesco convent collapsed, along with its dormitory, and the *palazzo* of the governor was badly damaged, as well as that of the *podestà*. The city walls were split open in a number of places, and all their battlements collapsed (431 merlons according to one source), as well as the outwork. Two great towers collapsed or were badly damaged. There were from 13 to 20 victims in the town. Extensive damage also occurred in fortified and other villages in the *contado* (a rural area subject to the urban authorities). Many elegant *palazzi* collapsed, and there were several victims. At Borgo San Sepolcro (present-day Sansepolcro), the shock caused the total collapse of many houses, and the partial collapse of the monastery of S.Agostino. It caused almost all chimneys to collapse, as well as the battlements on the castle of S.Nicolò; and it badly damaged the Porta della Rocca and the Porta del Ponte, as well as part of an old tower. 800 merlons on the town walls collapsed, and the walls themselves were in danger of collapse at various points. The monastery of S.Lorenzo was probably also damaged, and its walls were in danger of collapse. There were many victims. At Montone, a small village between Città di Castello and Gubbio, a *palazzo* which had only just been built by Braccio Fortebracci was badly damaged. The earthquake was also felt at Gubbio and Perugia but caused no damage there. The only reported environmental effect was a great deal of deep fissures, but it is not possible to establish exactly where they occurred.
- April 29-30 The main shock was also followed by about 125 aftershocks through the night of 29-30 April until dawn, felt at Città di Castello.
- May 1 Finally there was another very violent shock during the night of 1 May, at 0:35 UT (three quarters of the way through the fifth hour, "Italian time"): at Città di Castello this shock reduced to ruins 15 houses and most of the town's battlements and it gave rise to such panic that almost the entire population abandoned the city; it was strongly felt at Perugia.

Historical sources

At the time of the earthquake, Città di Castello was part of the Perugia *circoscrizione*, which had been added to the other six in the Papal States. Borgo San Sepolcro, on the other hand, was ruled over by the Republic of Florence.

This seismic sequence is recorded in many contemporary sources compiled at the very time of the shocks or shortly afterwards.

The sources concerned are *Riformanze* (i.e. decisions taken by town councils) and letters, as well as published and manuscript chronicles.

The most comprehensive previous study of this earthquake is that of Castelli *et al.* (1997), which is based on documents now in the Archivio Storico Comunale at Città di Castello and the Archivio di Stato in Milan, as well as on published contemporary chronicles.

In our research, we added to existing knowledge by making use of new sources in the Archivio Storico Comunale at Sansepolcro and the Biblioteca Riccardiana and Moreniana in Florence; and we also found a parchment dated 4 December 1461 (published in degli Azzi 1914, p.107, no.57), which is unknown to the tradition of studies in historical seismology.

DOCUMENTS

As early as 26 April 1458, that is to say the very day of the most violent shock, the minutes of a meeting of the town council of Città di Castello give a preliminary assessment of the damage and number of victims in the town. The document concerned is amongst the *Riformanze* (also known as the *Annali Tifernati*) in the Archivio Storico Comunale at Città di Castello (reg.46):

"26 April 1458. During last night and yesterday, there were numerous earthquakes, and shortly before the ninth hour today there was a violent shock, causing the collapse of about a third of Città di Castello and the death [...] of a few people, namely 13".

Die xxvi Aprilis 1458 Preterita nocte ac die hesterno quam plures fuerunt terremotus hodie parum ante horam nonam magnus terremotus factus est quo tertia ferme pars civitatis castelli concidit cum morte [...] personarum pucarum videlicet XIII.

The earthquake is also mentioned in the minutes of meetings of the same town council at Città di Castello on 1 and 7 May and 25 August 1458. Although research on this earthquake has been carried out more than once since the 1990s, there has been no examination of local documentary sources at Sansepolcro. Our research has brought to light three new documents which record damage there. One of these is a petition dated 4 December 1461 (ed. degli Azzi 1914, p.107), which records that the people of Borgo San Sepolcro sent a request to the *signoria* of Florence, asking that the salary of the *capitano* of the town should be reduced, in order to cover the cost of repairing the city walls, which had been damaged in an earthquake. The document was drawn up by Giovanni di Pietro da Stia. Here is the passage referring to damage to the town walls:

"It is respectfully pointed out [...] by the commune and people of Borgo San Sepolcro [...] encountered through the necessity of repairing the walls of the town and their outwork, which were much shaken and threatened to collapse because of the earthquakes.

Reverenter exponitur [...] pro parte Comuni et hominum terre Burgi [...] supervenit postea occasio quedam resarciendi antemuros et muros dicte terre qui in pluribus locis ob terremotus plurimum commoti erant et ruinam minabantur.

There are two *Riformagioni* in a fragmentary register in the Archivio Storico Comunale at Sansepolcro (Serie II, *Riforme, Provvisioni e deliberazioni dei consigli*, reg.4) which refer to measures taken in favour of a private individual and a monastery then under construction. The documents do not specifically mention an earthquake, but since they are quite close to it in time (October 1458 and February 1459), it seems fairly likely that they are referring to damage caused by the shocks of the previous April. In the document dated 7 October 1458 we read:

"Also under examination was a petition lodged by Pietro di Cristoforo Varbi, a barber who, to be saved from ruin, begs that a wall of his house, which stands on top of a wall of the loggia of the commune, be rebuilt".

Item intellecta petitione Petri Cristofori Varbi tonsoris petentis volle conservari redificare murum sue domus super muro lodie nostri Comuni.

The document of 24 January 1459 records:

"Note was also taken of the extreme poverty and devotion and the pious life of the nuns of S.Lorenzo, as well as the state of their convent, whose walls are in danger of collapse".

Item ex actenta extrema paupertati et extrema devotione et vite sanctimonia Monialium Sancti Laurentii et eiusdem monesterium in quo domi muri minatur ruinam.

LETTERS AND CHRONICLES

The most informative of the chronicle sources are three letters written a few days after the earthquake. The first two of these are quoted in a partial transcription in Castelli *et al.* (1997, pp.30-1).

A letter from Niccolò Vitelli of Città di Castello (now in the Archivio di Stato in Milan, *Carteggio Sforzesco*, Potenze estere, Roma, 47); it is undated, but seems to have been written in late April or early May 1458 to an anonymous correspondent, and states: "the town walls [...] here are all left without battlements and are split open in a number of places. The barbicans or outwork are all falling into the moats [...] the front of the great tower of Porta S. Jacopo, which looks towards Borgo San Sepolcro, is flattened right down to its foundations [...] the great tower of Porta del Ponte is in ruins. Inside the town, about 400 houses are in ruins and almost all the others are damaged and with cracks. The church of S. Francesco and its dormitory have collapsed; S. Egidio is completely flattened; the governor's house has lost its ceilings and the walls have split open".

le mura [...] qui tucte sono rimase senza merli et aperti in molti luoghi. I barbican overo antemura tucte se ne vanno nelli fossi [...] il turrione della porta San Jacopo, che va al Borgo di Sansepolcro, la faccia dinanzi tucta spianata fino ai fundamenti [...] in ruina il turrione della porta del Ponte. Dentro alla terra sono ruinate circa 400 case et quasi l'altre tucte sono intronate e fesse. La chiesa di San Francesco caduta insieme col dormitorio; San Giglio tucto spianato; la casa del governatore è rimasta senza volte et le mura sono aperte.

The same source records that in the countryside around Città di Castello "many privately owned *palazzi* have collapsed and a number of people have died" (*molti palagi di cittadini sono cascati et morti assai persone*). He also reports that a *palazzo* recently built by Braccio Fortebracci at Montone has suffered considerable damage (*danno assai*). A letter written on 4 May 1458 by a certain Costantino of Perugia to a cleric called Ludovico (Archivio di Stato in Milan, *Carteggio Sforzesco*, Potenze estere, Umbria e Sabina, 139), tells of severe panic in the town:

"there is scarcely anyone large or small still lodging in this town; they are all in the country in the orchards and fields".

in quista città non ci arbergha quase persona né granda né piccola, tute a campo per gli ortora e chanpe.

The same source reports a certain amount of damage at Borgo San Sepolcro: "a large number of merlons have collapsed, more than 800 in fact, as well as 2 cottages [...] and several houses".

chadute ci è grande quantità de mierogli più de 800 e 2 casarette [...] e parecchie case.

A letter from Cambio Zambeccari, who was a citizen of Bologna but lived in Perugia, reached the sixteen *Riformatori dello Stato della Libertà*, the chief local authority committee at Bologna, on 10 May 1458. It was transcribed in the *Cronaca Varignana*, an important 15th century text belonging to the Bolognese chronicle tradition:

"1458. – On 26 of the month of April, at halfway through the seventeenth hour, there were great earthquakes at Città di Castello, which razed about 180 houses to the ground and killed about 20 people; and they did such damage to the *palazzo* of the governor and that of the *podestà* that it needed only a little more to reduce them to ruins. There is not a single house that has not been damaged in some way. And on the same day, these earthquakes struck Perugia and its *contado*, but without causing any damage. And on 29 of that month from evening until dawn there were 125 shocks, and they reduced many houses to ruins and opened up some very deep cracks. And on the last day of that month, at three quarters of the way through the fifth hour, there was another earthquake at Perugia and a similar one at Città di Castello, and it reduced to ruins about 15 magnificent houses and most of the town's battlements; so the people of the former left their town and dwelt in the fields in tents. And for this reason the people of Perugia began to make processions and give alms and fast to save their town. The earthquake did not go beyond the territory of the Perugians and Città di Castello".



1458
April 26

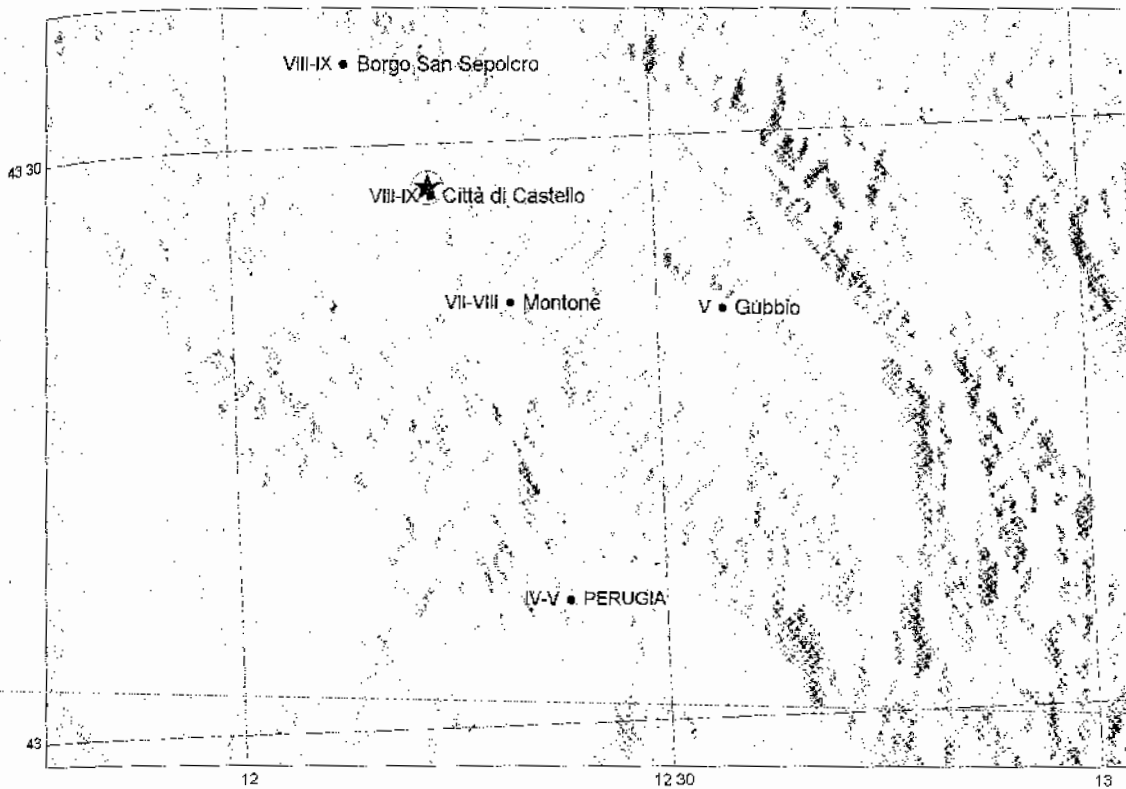


fig. 126

1458. Adì xxvi del mexe d'aprile a hore xvii 1/2 fono grandissimi terremoti a Città de Chastello, et gittarono a terra circa 180 chaxe insino ally fondamenti et uccixeno circha xx persone e guastono tutto el palazo del governadore e del podestà, i quali con piccola cosa andarano per terra. Non iè chaxa che non sia fessa e rotta. Et in questo dì proprio li ditti terremoti fono in Peroxa e nel contada, ma non feceno danno alchuno. Et adì 29 ditto da la sira infino a l'aurora del dì ne fono 125, et a l'ultimo gittò per terra molte chaxe; et molte chaxe profondissime s'aperseno. Et adì ultimo ditto mexe a hore 5 3/4 venne un altro terremoto a Perosa e per lo simele a Città de Chastello, et gittò per terra circha 15 magnifiche chaxe e la maggior parte delli merli de la cittade: et per questo li cittadini di quella uscino fuora de la citade e alozavano per li campi con tende. Et per questo li Peroxini comenzono a fare grande procesione e limosine e dezunii per salvamento de la loro cittade. El quale terremoto non uscì fuora del tenitorio de' Peroxini e de Città de Chastello.

The same letter is recorded in the *Cronaca Rampona*, a 15th century text which is similar to the *Cronaca Varignana*. The information found in 15th century chronicles is less detailed than in earlier sources, and also contains chronological and other mistakes. These chronicles, whether published or in manuscript, were already known to the seismological tradition, or to recent seismic studies. There is a passage in the *Cronaca* of Guerriero da Gubbio (it has been wrongly dated to 1457), which conflates information about two separate events: one of them is the great earthquake of 5 December 1456, affecting the kingdom of Naples and Abruzzo, and the other is that of 26 April 1458 affecting Città di Castello and Gubbio:

"In this year [1457], there were very great earthquakes in the kingdom [of Naples] and Abruzzo, as a result of which many towns were reduced to ruins: many buildings collapsed in Naples; and similar things happened at Città di Castello; there were earthquakes at Gubbio, too, but they did no damage".

In questo anno foro grandissimi tremuti in lo Reame et in Abruzzo, per li quali molte

terre ruinaro: a Napoli cascaro molti ediftii: a la Cetà de Castello el simile: in Ugubio foro, ma non danegiario.

There is a brief reference to the earthquake in the *Annales Forolivienses*, which incorrectly give the date as 7 April 1458:

"In the year of Our Lord 1458 [...] On 7 April. Città di Castello was shaken by earthquakes. Much of it was reduced to ruins, and many people were very badly affected".

Anno Domini MCCCCLVIII [...] Die VII aprilis. Civitas Castellii, a terremotibus vexata, in magna parte ruit et multi in ruina precipitant.

The *Cronaca senese* of Tommaso Fecini also wrongly records the date as 14 April:

"1458. On 14 April, there were earthquakes at Perugia and Città di Castello and in their *contadi*. Many buildings collapsed and there were many victims".

1458. A dì 14 aprile furono e' tremuoti a Perugia e a Città di Castello e a loro contadi, cascò molti difizi e morivi molta gente.

The *Cronica latina* is more precise: "1458 26 April. There was a tremendous earthquake at *Tiphernum* [Città di Castello] around midday. Three bastions were destroyed and up to 400 houses, and 431 merlons; and almost all houses were left leaning at an angle or were split open. There was also a great deal of damage in hamlets and fortified villages; and immediately afterwards there were many more earthquakes, but they were not so violent".

1458 26 aprilis. Fuit Tiferni maximus terremotus iuxta meridiem; diruta sunt tria propugnacula, et ad 400 domus, ac 431 pinnae, et paene domus omnes incurvatae sunt et apertae, in pagis etiam et castris multa damna fecit; multi postea terremotus subsecuti sunt, sed non adeo violenti.

The anonymous manuscript *Riccardiano* no.1030 (Biblioteca Riccardiana e Moreniana, Florence), is independent of all the preceding sources, and is the only chronicler to record damage and victims at both Sansepolcro and Città di Castello in the same text: "And in the year 1458 there were great earthquakes in the month of April at Borgo San Sepolcro, where part of an old tower and other buildings collapsed, and many people were killed. And on the same day and at the same time many houses collapsed and many people were killed by the earthquake at Città di Castello".

E nell'anno 1458 e del mese d'aprile vennono grandi tremoti al Borgo a San Sepolcro, chevvi rovinò parte d'una torre vecchia e altri casamenti con la morte di molti uomini. E in detto tempo e ora a Città di Castello per detto tremuoto molte rovine di case e morte d'uomini.

Amongst 16th century sources, further details about Sansepolcro are to be found in the local manuscript chronicle compiled by Francesco Bercordati (Biblioteca Comunale, Sansepolcro, J.107):

"In the year 1458, on 26 April, there were very great earthquakes throughout Italy and especially at Borgo San Sepolcro where many houses completely collapsed as well as almost all the chimneys in the town. Part of the monastery of S.Agostino collapsed, as did the battlements at the back of the Rocca San Nicolò, and the stones flew almost as far as the Torre dei Manzetti, and they broke the legs of M.a Violante di Nicolò Pannilunghi. The Porta della Rocca and the Porta del Ponte both collapsed".

L'anno 1458, adì 26 di Aprile fu grandissimi tremoti per tutta Italia et in particolare nel Borgo S.Sepolcro che cascaro molte Case da Fondamenti et quasi tutti i Camini di detto Borgo. Cascò parte del Monasterio di S.Agostino, i Merli della Rocca San Nicolò dal canto di dietro et le pietre arivorno quasi alla Torre dei Manzetti, dette Pietre ruppero le gambe a M.a Violante di Nicolò Pannilunghi. Cascò la Porta della Rocca e la Porta del Ponte.

There is also a report in a Gubbio chronicle of the second half of the 16th century by a canon called don Francesco (ed. 1902, p.105) which must refer to the earthquake of 26 April 1458, even though the year is given as 1448:

"In 1448 on Wednesday 26 April, at midday, there was an earthquake [at Gubbio]; many people were killed at [Città di] Castello and many houses collapsed there".

1448 a di 26 di aprile, a mezzodi, che fu di mercore, fu il terremoto; ammazzò molte persone a Castello et cascarono molte case.

In 1448, 26 April was not a Wednesday but a Friday; but if we date the event to 1458, the chronological indication fits. This same chronicle, with the same dating errors, is also a codex in the Biblioteca Apostolica Vaticana, to which attention was drawn by Baratta (1899, p.438).

▲

1458 04 25

localities	lat.	long.	I
Città di Castello	43 27	12 14	F

1458 04 26 12:15 UT ☉ = 43 28 12 14 Io = VIII-IX Me = 5.8 Sites: 5

localities	lat.	long.	I	localities	lat.	long.	I
Città di Castello	43 27	12 14	VIII-IX	Gubbio	43 21	12 35	V
Sansepolcro	43 34	12 08	VIII-IX	Perugia	43 06	12 23	IV-V
Montone	43 21	12 19	VII-VIII				

1458 04 29-30 125 aftershocks

localities	lat.	long.	I
Città di Castello	43 27	12 14	F

1458 05 01 0:35 UT

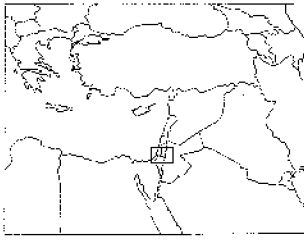
localities	lat.	long.	I	localities	lat.	long.	I
Città di Castello	43 27	12 14	VII	Perugia	43 06	12 23	IV-V

{ 324 } 1458 November 8 or 16 Al-Karak [western Jordan]

- sources 1 Ibn Taghribirdi, *Hawadith*, VIII/2, p.319; *Nujum*, XVI, p.127; al-'Ulaimi, *al-Uns*, p.400; Ibn Iyas, *Bada'i'*, II, p.350
- source 2 al-Suyuti, *Kashf*, p.58
- literature Taher (1979); Klinger *et al.* (2000)
- catalogues d. Amiran *et al.* (1994); Ambraseys *et al.* (1994)
- catalogues p. Poirier and Taher (1980); al-Hakeem (1988)

In the month of November 1458, a strong earthquake struck southern Palestine. At Al-Karak, part of the citadel was destroyed, most of the town walls collapsed, as well as the government building and many houses and towers. There were about one hundred victims. Minarets collapsed at Ramla and Al-Khalil (Hebron). Part of a minaret collapsed in Jerusalem, as well as the great dome next to the church of the Holy Sepulchre. The shock was felt to a slight extent in Cairo.

There is some uncertainty as to the day when the earthquake occurred. The contemporary Arab historian Ibn Taghribirdi deals with the event in two of his works: in *Hawadith* he records the date as Thursday 9 *Muharram* (16 November); while in *Nujum* it is given as Wednesday 1 *Muharram* (8 November). The days of the week correspond correctly to the dates. Other Arab writers, all of whom lived in the second half



1458
November 8

0 30 km

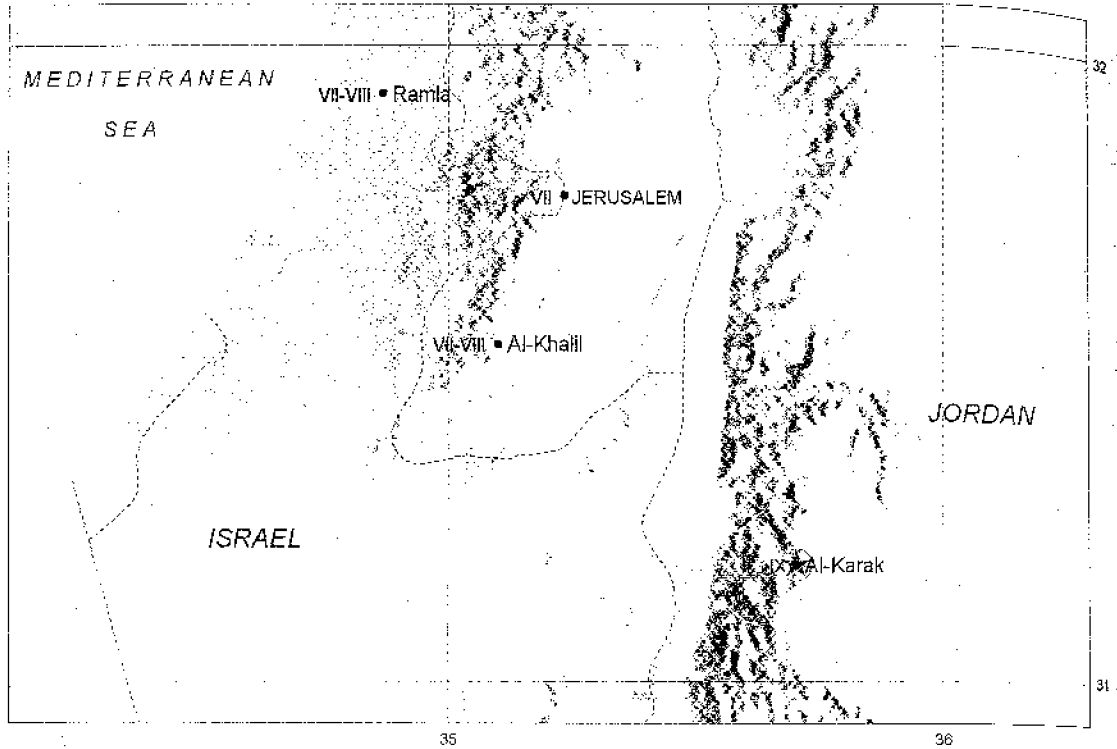


fig. 127

of the 15th century and were only a few years old at the time of the earthquake, simply give the month or the year of the earthquake. In *Hawadith*, Ibn Taghribirdi provides the most detailed overall description of the earthquake:

“On Thursday 9 [of *Muharram* = 16 November 1458], there was a minor earthquake at new Cairo, but it was sufficiently strong in Syria to cause the collapse of most of the town walls, the government building and many dwellings in the town of Karak. Furthermore, the minaret collapsed in the town of Ramla, as well as another minaret at Khalil, part of a minaret in Jerusalem and the great dome which was close to the *Qumama* [the church of the Holy Sepulchre]”.

و في اليوم الخميس تاسعه كان بالقاهرة زلزلة خفيفة و كانت شديدة بالبلاد الشامية بحيث أنه وقع منها غالب سور مدينة الكرك و دار نيابتها و دور كثيرة و سقطت منارة مدينة الرملة و اخرى بالخليل و بعض واحدة بالقدس و القبة الكبيرة التي كانت عند القمامة.

In *Nujum*, Ibn Taghribirdi simply records the earthquake effects at Al-Karak:

“At the beginning of the month [of *Muharram*] there was a terrible earthquake in the town of Karak, which destroyed various parts of the citadel, including houses and towers. It was Wednesday [8 November]”.

و في أولها كانت الزلزلة المهولة بمدينة الكرك، أخرجت أماكن من قلعته و دورها و أبراجها. فكان الحرم الأربعاء.

Al-'Ulaimi mentions some effects at Jerusalem, his native city:

“A minaret overlooks the *Zawiya al-Darka* [a building in the city], part of which was destroyed in the earthquake which occurred in the month of *Muharram* 863 [of the *Hegira* = 8 November – 7 December 1458]”.

منارة علو زاوية الدرگاه و قد هدم بعضها من زلزلة وقعت في المحرم سنة ثلاث و ستين و ثمانمائة

The information provided by Ibn Iyas is in more general terms:

"In that month [*Muharram*], there was an earthquake in new Cairo, but it was slight. A similar one occurred in the region of Syria, but there it was a strong and violent shock, causing the collapse of a great number of houses in Jerusalem and Khalil".

و فيه حدثت بالقاهرة زلزلة، لكنها كانت خفيفة، و وقع مثلها بالبلاد الشامية، و كانت هناك زلزلة شديدة صعبة، و وقع منها عدة دور ما بين القدس و الخليل.

Al-Suyuti specifies the number of victims at Al-Karak, which does not appear in the other sources: "A violent earthquake destroyed a large part of the citadel and its towers at Karak. A hundred people were killed" [863 H. = 8 November 1458 – 27 October 1459].

كانت زلزلة عظيمة بالكرك أخرجت أماكن كثيرة من قلعته وأبراجها وماتت مائة نفس.

Poirier and Taher (1980, p.2193) date this earthquake generically to the year 1459 and give the single locality of Al-Karak an intensity of grade VIII MM. Amiran *et al.* (1994, pp.270-1) give three incorrect dates (1456, 1457 and 1459) for this event, though they indicate that it may have been a single occurrence. Ambraseys *et al.* (1994, pp.49-50) prefer to date the earthquake to 12 November 1458, because two other unpublished Arab authors agree on that date, and give it an epicentral intensity of class D which is equivalent in their classification to a range from between damaging and destructive (approximately VII to IX MSK).

▲ 1458 11 08 or 16 ★ = 31 11 35 42 I₀ = VIII M_e = 5.6 Sites: 5

localities	lat.	long.	I	localities	lat.	long.	I
Al-Karak HKJ	31 11	35 42	IX	Jerusalem	31 46	35 14	VII
Hebron WS	31 32	35 06	VII-VIII	Cairo	30 03	31 15	III-IV
Ramla IL	31 56	34 52	VII-VIII				

< 325 > 1461 November 16 Abruzzo Apennines [central Italy]

< 326 > 1461 November 27 Abruzzo Apennines

< 327 > 1461 December 11 L'Aquila

< 328 > 1461 December 18 L'Aquila

< 329 > 1462 January 3 L'Aquila

< 330 > 1462 January 4 L'Aquila

< 331 > 1462 March 27 (2:00 UT) L'Aquila

< 332 > 1462 March 27 (21:00 UT) L'Aquila

SOURCES 1 Paul II (pope), two indulgences, 1467 and 1471, in Pansa (1900, p.252); Malombra Filippo, Letter, 15 December 1461 (ed. Storti 1998, no.231, pp.393-5); D'Angeluccio, *Cron.*, cols.899-900; De Ritiis, *Chron.*, pp.207-9; Tummolillo, *Notab.*, p.96; Dello Mastro, *Diario*, p.117; *Cron. Ramp.*, p.291; *Cron. Varign.*, IV, p.291; Guerr. Gubbio, *Cron.*, p.74; *Ann. Foroliv.*, p.98; Rinuccini, *Ricordi.*, p.xc

SOURCES 2 BAVat, *Vat. Lat.*, 7934, *Chron. ascul.*; BCGambRimini, 4, Paci, *Apparatus*; Ghirardacci, *Della hist.*, pp.177-8; *Cron. ascol.*, p.34; Pellini, *Dell'hist.*, II, p.664; Antinori, *Ann.* (18th c., ed. 1971), vol.15, in Casti (1887, pp.111-22)

- historiography Cirillo (1570); Buoni (1571); Casti (1887); Vittori (1896); Costantini (1915); Gavini (1915); Lopez (1987); Figliuolo (2002)
- literature Spadea *et al.* (1985)
- catalogues d. Filippo da Secinara (1652); Perrey (1848); Mallet (1853); Capocci (1861); Mercalli (1883); Baratta (1899, 1901); Milne (1911); *Boschi *et al.* (1995, 1997, 2000)
- catalogues p. Giorgetti and Iaccarino (1971); Carrozzo *et al.* (1973); Postpischl (1985); CPTI (1999)

Effects of the earthquakes

The Abruzzo Apennines area, of which L'Aquila was the most important city, was hit by a sequence that lasted at least four months. The numerous contemporary sources allow for the reconstruction of the chronology and the outlining of a complex and detailed damage scenario.

November 16 A shock was felt at L'Aquila, but caused no damage.

November 27 During the night of 27 November 1461, loud subterranean noises were heard, after which L'Aquila and the surrounding area were struck by two strong earthquake shocks. They were about two hours apart, and are described by contemporary sources as being of approximately equal intensity. The first shock lasted about one minute (sufficient time to recite the Lord's Prayer and Hail Mary three times each), and occurred at about 21:05 UT (the fifth hour, "Italian time"). The second shock lasted about 12 seconds (sufficient time to recite the Lord's Prayer once), and occurred at 23:05 UT (the seventh hour, "Italian time"). It considerably aggravated the effects of the first, but it is not possible to distinguish clearly between the effects of the one and the other.

All buildings in L'Aquila were badly affected: a quarter of its houses (more than one thousand) collapsed entirely, and all the others suffered partial collapse and serious damage. The north-western area of the city suffered the worst damage: that is to say the Porta Rivera district, where about 75 houses were destroyed, especially in the old street called Gianvincioni, the Porta Pile district, and that of Via Sassa, where there were a great many collapses. The north-eastern part of the city, towards the *Intempera contrada*, proved to be the least seriously affected. Many of the innumerable city towers also collapsed. It is possible to put together a detailed list of damage to churches and public buildings in the city of L'Aquila itself. As recorded in chronicle sources, 46 monuments in the city were damaged (see list on the following page).

There were numerous victims. The sources suggest 80 or 100, many of them crushed in the collapse of the ceilings at the main hospital (S.Salvatore). The earthquake effects were made worse by a fire and, later on, by heavy falls of snow in January 1462. In the surroundings of L'Aquila there were altogether about 80 fortified villages (*castella*) amongst which the following were most seriously affected: at Onna all the houses collapsed, killing many of the inhabitants; Sant'Eusanio Forconese was almost completely destroyed, including the recently built castle, and there were many victims; Castelnuovo collapsed almost entirely, including the towers in the walls, and there were 28 victims; at Castelvechio Calvisio many houses collapsed and there were 12 victims; and Poggio Picenze collapsed almost entirely. The felt area of this earthquake was extremely large, including Perugia and Rome, where the church bell at S.Marcello rang three times and then four times a little later, probably in relation to the two shocks. San Germano (present-day Cassino) also felt the earthquake, but only slightly.

In L'Aquila and the surrounding area, economic activity was severely affected: the whole season's grain reserves were destroyed in the ruins. And a very sharp rise in the price of firewood and provisions created tensions later on, during the period of reconstruction. From the time of the first shock, the people of L'Aquila reacted by fleeing into the surrounding countryside, where they erected tents. Many of them subsequently returned to the town, but set up home in the town squares (*Piazza del Mercato, Campo della Fossa*, and other open spaces inside the walls), where wooden huts were put up. Religious services were suspended because of collapses in churches

and the threat of further destruction. Numerous processions complete the picture of popular reaction to the disaster.

The most intense phase of the sequence came to an end; up to that day about a hundred shocks had been felt at L'Aquila; December 11

At about 0:10 UT (the eighth hour of the night, "Italian time") there was another strong shock at L'Aquila, causing the collapse of a number of houses which had already been damaged in earlier shocks; and in their fright, the inhabitants fled into the squares and fields, where they set up tents; December 18

At about 20:25 UT (the fourth hour of the night, "Italian time") a violent shock struck fear into the people of L'Aquila; 1462 January 3

At about 22:25 UT (the sixth hour of the night, "Italian time"), a violent shock struck fear into the people of L'Aquila; January 4

2:00 UT (the eighth hour of the night, "Italian time"); a shock struck fear into the whole of L'Aquila; March 27

21:00 UT (the third hour of the night, "Italian time"), there was another shock at L'Aquila. March 27

L'AQUILA: MONUMENTS DAMAGED BY THE EARTHQUAKES OF 27 NOVEMBER 1461

Churches and bell-towers

S.Agostino: part of the frontispiece, the side chapels and the roof collapsed;

S.Andrea: partly collapsed;

S.Angelo di Vio: almost completely collapsed;

S.Bernardino: part of the nave, a side chapel, the dome and all the piers collapsed, and the side walls were damaged;

S.Biagio: the bell-tower was damaged;

S.Chiara: a side wall was badly damaged;

S.Croce: partly collapsed;

S.Domenico: the nave and a side aisle were damaged;

S.Flaviano: badly damaged;

S.Francesco: one of the side aisles collapsed, and the roof and chapels were damaged;

S.Giovanni: partly collapsed;

S.Giuliano di Barete: the church and bell-tower almost completely collapsed;

S.Giusta: the side chapels collapsed;

S.Leonardo: the frontispiece collapsed;

S.Lorenzo: the bell-tower and fountain collapsed;

S.Marciano: badly damaged;

S.Marco: the roof and walls were badly damaged;

S.Maria di Bagno: the bell-tower and part of the church building collapsed;

S.Maria di Civitatem: one corner collapsed;

S.Maria di Collemaggio: the principal chapel collapsed, and the side walls and roof were badly damaged;

S.Maria di Farfa: badly damaged, and part of the masonry collapsed;

S.Maria di Intempera: a chapel collapsed;

S.Maria di Paganica: most of the beams collapsed;

S.Maria di Rasino: partly collapsed;

S.Maria di Roio: badly damaged;

S.Maria Maddalena: badly damaged, and part of the masonry collapsed;

S.Marinella: partly collapsed;

S.Massimo (the cathedral): the wall opposite the bishop's palazzo: completely collapsed;

S.Pietro di Preturo: completely collapsed;

S.Pietro di Sassa: more than half the building collapsed, and the bell-tower leaned to one side;

S.Quinziano: much of it collapsed;

S.Silvestro: the bell-tower collapsed;

S.Spirito: partly collapsed;

S.Vittorino: the central chapel collapsed, and the bell-tower was damaged.

Monasteries

S.Agostino: the surrounding wall, the cells and a large part of the workshops collapsed;

S.Chiara: completely collapsed;

S.Croce: partly collapsed;

S.Maria di Collemaggio: the building collapsed almost completely;

S.Domenico: the dormitory and stairs collapsed;

S.Francesco: damaged.

Palazzi

town hall: the wing assigned to the *capitano di giustizia* collapsed; the remainder of the building was badly damaged and had to be supported on all sides.

bishop's palazzo: the building was badly damaged by the collapse of the adjacent wall of the cathedral of S.Massimo.

Hospitals

S.Salvatore: although only recently built, it suffered serious damage, partly because of the violence of the earthquake, and partly because it was struck by collapses at the nearby church of S.Bernardino;

S.Matteo: suffered collapses;

S.Pietro di Sassa: suffered collapses;

S.Spirito: suffered collapses;

S.Giacomo: suffered collapses.

Historical sources

When the earthquake occurred, the city of L'Aquila and its territory corresponded roughly to that of the ancient diocese of Forcona, together with part of that of Rieti; and according to a 1414 assessment it included 81 castles (Lopez 1987). L'Aquila was part of the province of Abruzzo Ultra in the kingdom of Naples, and each year it sent a *capitano regio* to the Neapolitan court as local representative. The city authorities at L'Aquila were therefore responsible for ordinary administration, whereas decisions concerning the whole territory lay within the competence of the administrative offices of the court of Naples. Unfortunately, however, 15th century documents at the Archivio di Stato both in L'Aquila and Naples have been partially lost or destroyed. This earthquake is well documented and described in contemporary and slightly later sources. The source which is closest in time to the event is a letter sent from Penne (c. 35 km east of L'Aquila) by Filippo Malombra, the Milanese ambassador to Naples, to Francesco Sforza, duke of Milan, on 15 December 1461. The letter describes effects at the city of L'Aquila and the surrounding area. The damage to the church of S.Maria di Collemaggio at L'Aquila is recorded in two acts of indulgence granted by pope Paul II (in Pansa 1900, p.252). The principal chronicle sources for the L'Aquila area are the two contemporary works by Francesco d'Angeluccio di Bazzano and Alessandro De Ritiis; both of whom lived at L'Aquila in the second half of the 15th century. The two sources are not independent, for De Ritiis explicitly admits that he knows D'Angeluccio's chronicle. Apart from a clash over the date and time of the two principal shocks, the two narratives broadly agree in their description of effects. However, De Ritiis adds details about damage to buildings in L'Aquila which are not mentioned by D'Angeluccio.

There are also two contemporary chroniclers who make brief comments about effects outside the epicentral area. They are Angelo Tummolillo, who refers to San Germano (Cassino), and Paolo dello Mastro, author of a diary about Rome.

Brief references to serious damage at L'Aquila are also made in other 15th century chronicles and anonymous works: in Guerriero da Gubbio, the *Cronaca Rampona*, the *Annales Forolivienses*, the *Cronaca Varignana*, and Alamanno Rinuccini's continuation of the *Ricordi storici* of his father Filippo.

The *Annali degli Abruzzi*, a voluminous work by A.L. Antinori, an 18th century scholar from L'Aquila, the manuscript of which is available in a facsimile edition (1971), contains the most detailed description of the earthquake's effects in the city of L'Aquila and the surrounding area. It has to be kept in mind that many sources from L'Aquila have been lost, and hence Antinori provides us with indirect knowledge of evidence which is no longer accessible, a striking example being the testimony of Nicola di Buccio, who personally experienced the earthquake. For this reason, Antinori is an important source, even though a late one. Information provided by Antinori has been used in our description of effects on buildings at L'Aquila, but his text is not set out in full.

DOCUMENTS

Set out below is the most significant passage from Filippo Malombra's letter: "I am sure Your Excellency will have been told some days ago how on 28 of last month [November] there were two earthquakes on Friday night at L'Aquila and in a large part of its contado: one halfway through the fifth hour of the night and the other at the ninth hour of the night. People who have come from there say that more than a thousand houses have collapsed and that all the others have been split open, and more collapse every day, and there have been a great many victims, especially amongst the people of L'Aquila, many of whom are now living out in the country, and countless castles are in ruins in their contado, and reliable people say that you would think there had never been any castelli there, and there have been many victims in the contado. [...]. From the royal town of Penne, your faithful servant, 15 December 1461".

son certo che la vostra illustrissima signoria zà ha più di sarrà advisata come a dì 28 del passato uno veneri de nocte in l'Aquila et allo forzo dello so contato sono dui taramotii, uno alli cinque hore et meza de nocte et l'altro alle nove hore de nocte. Per persone vinuti di li dicino essere cascate più de mille case et tucte le altre averte, et ogni di ne va cascando, et morti infinidissimi persone, senza numero dicti aquilani, el forzo loro allozano alla campagna, in nello contato loro ne son ruzinaty multi et multe castella che per persone degne de fede dicono che li par che may non fosse castelle, et morti infinidissime persone in nello contato [...]. Ex regia civitate Penne fidelissime die 15 decembris 1461.

The ambassador's letter goes on to tell of the religious rites carried out after the earthquake. As regards the chronology of the seismic events, it has to be pointed out that 28 November was not a Friday but a Saturday in 1461; so the shocks occurred on the night of Friday 27 – Saturday 28 November, as is clearly stated in Paolo dello Mastro's diary, set out below. In the first act of indulgence, dated 6 November 1467, pope Paul II gave the monks of S.Maria di Collemaggio permission to sell some houses: "to repair the choir and church of Collemaggio, which have been damaged by an earthquake, and in which it is difficult to hold services, and where forty friars live together".

ad reparandum chorum et ecclesiam Collismadij, quae terraemotu conquassata extitunt, et in ea divina officia vix coelebrari possunt, ubi communiter habitant quadraginta fratres.

In the second indulgence, dated 14 September 1471, the pope gave the monks permission to sell a house with a garden for the sum of 650 florins, because they were: "in need of money to repair the principal chapel, which was destroyed in an earthquake some time ago".

indigentes pecunijs pro reparatione Capellae majoris olim tempore terraemotus dirutae.

CHRONICLES

Francesco D'Angeluccio writes: "In the years 1461 on 27 November, after the fifth hour of the night had struck, there was such an earthquake at L'Aquila that all the houses in the city were shaken, and many of them collapsed in ruins. And the earthquake badly affected the beautiful churches of L'Aquila, causing large parts of them to collapse. This was the case with S.Domenico, S.Francesco, S.Agostino, S.Silvestro and many other churches in L'Aquila. And the earthquake caused the collapse of the side of the cathedral of S.Massimo opposite the bishop's palazzo, which was itself badly shaken. And it also threw S.Bernardino to the ground, including all its great dome; and it reduced the hospital to ruins: all the ceilings collapsed, and the earthquake caused cracks in a number of places on the outside. And it reduced to ruins the whole great chapel of S.Maria di Collemaggio [...]. And the whole square was full of huts where men dwelt in their fear. And so they lived in tents in Campo della Fossa and at the spinning-mills and similarly throughout L'Aquila, and none of the inhabitants were willing to go back home. And I can also tell you that there was another earthquake that same night, about two hours after the first. It was no less powerful than the first, and earthquakes continued without interruption, night and day, until 11 December. We think that there were far more than one hundred, and they kept coming. It is thought that there were about 80 victims, or a few more than that. The earthquake has done a great deal of damage in the *contado*, but I cannot tell you in any detail which places were more damaged and which less. The worst damage in the *contado* was at Santo Sano [Sant'Eusanio Forconese], Castello novo [Castelnuovo], and Poggio [Poggio Picenze], and it did great damage everywhere. The *Palazzo del Capitano* also collapsed, and two knights who were there received head injuries; and a chancery official was killed, as well as a nephew of the judge. And the clock bell fell from the *Torre del Comune* and half buried itself in the

ground, and the court bell fell down inside the tower, causing slight damage; and the clock bell did not break, nor was anyone injured.

Nelli anni 1461 a dì 27 de Novembre la notte a ore cinque sonate fo uno sì facto terramoto in Aquila, che sconcessò tutte le case d'Aquila, e cascarone multissime per terra. E guastò tutte le belle Ecclesie d'Aquila, e mannone multe parti delle Ecclesie per terra; como fo Santo Dominico, e Santo Francisco, e Santo Agostino, e Santo Salvestro, e multe altre Ecclesie dentro in Aquila. E gettone una costa de Santo Massimo verzo lu Biscobato; e sconcessò tutto lu Viscovato. Et più gettò Santo Bernardino, e gettonne tutta la copola granne; e guastò lu Spitale, tutte le vote n'annarono per terra, e fecelu crepare da fore in pù lochi. E a Santa Maria de Collemagio ne gettò tutta la Capella granne per terra [...]. E tucta piazza stava piena de logie, dove stavano l'omini ad avetare per paura. E così stavano in Campo de Fossa colle tenne, e alle tiratore, e così intorno a tutta Aquila, e che nullo Citadino non volia rentrer in Casa. E per più chiarirevi, quella medesima notte ne fo un altro circa a dui ore poi che lu primo, che non fo minore che llu primo, e ficto ficto non finivano la nocte né 'l dì d'essere terramuti per fi' a dì 11 de Dicembre; credemo ne siano stati più de cento assai più, e non finino d'essere. Crede se che nci siano perite dentro una Terra circa a 80 persone, che pochi poriano essere più. A facto gran male per llu Contado; dove poco, e dove assai non lo posso particolarmente chiarire. [...] Lu major danno in Contado ebe Santo Sano, Castello novo, lu Pogio, e per tucto à facto gran danno. E più cascò lu Palazzo del Capitano, e foroci tribulati li dui Cavalieri che ci erano, che abero rotta la testa; e morioci uno delli Mastri de li Acti, e uno nepote de lu Giudice. E cascò della Torre de lu Comune la campana de lu arlogio, e sotterolene be' la meza in terra, e caschò la campana de la sentenza, e caschò nellu pesele della Torre, e loco le fisse; e la campana de lu arlogio non se ruppe, e né se fece male nullo.

Alessandro De Ritiis provides a more extensive account:

"How the earthquake came to L'Aquila and destroyed almost all the city, and how the sacrament of the Eucharist in the Collemaggio chapel was saved.

In the year 1461, at the fifth hour of the night, there was an earthquake at L'Aquila, on 4 December, the night of St. Barbara, which caused everyone to rise from their beds, and for fear that there might be another earthquake, everyone fled into the squares, gardens and fields and it was thought to have been inspired by God, for this first earthquake did little damage. But during the same night, just before the tenth hour, there occurred an earthquake so great that no other of such violence could be recalled. It caused all the buildings to collapse, and in particular the baptismal church of S. Bernardino, and the columns which supported the dome. The dome was unfinished, having been erected as far as the beginning of the round part, but was subsequently rebuilt on bigger columns than before. The church of S. Maria di Collemaggio was also reduced to ruins, that is to say the whole of the principal tribune in which hung a square crystal tabernacle inside which was a silver tabernacle where three hosts were kept, and when the tomb fell down it smashed the crystal tabernacle and the silver one; but the hosts were untouched amongst the stones, which did not press down on them but rather covered them like little tombs, and this was a very extraordinary miracle. The church of S. Massimo was equally reduced to ruins and the principal column in the church was thrown outside. A similar fate befell the churches of S. Giusta, S. Agostino, S. Domenico, S. Silvestro, S. Maria di Paganica and many others. Buildings, moreover, collapsed in such a way that no-one could pass along the streets without climbing over the ruins of the houses. The *palazzo del Capitano* was also reduced to ruins, and two soldiers suffered head injuries, but a chancery official was killed, along with one of the judge's servants. I have found it stated in the chronicles of Francesco Giannuzio [i.e. in the chronicle of Francesco D'Angeluccio] that the first of the said earthquakes occurred at the second hour and the second at the fifth hour of the night, on 27 November, but I think he is mistaken. The said earthquakes lasted more than 15 days,

and men dwelt in makeshift lodgings and cloth tents in the said places, and especially in the main square, where the bishop had an altar placed before the church, where the above-mentioned hosts were brought and for several days masses were sung and, while Giovanni Albanese, a Dominican, preached, the fear of earthquakes was so great, for the earth continually shook, that no-one dared return home to eat bread, wine and so on. There were about 80 victims in the city, and as many in the *contado*, especially at S.Osanio [Sant'Eusanio Forconese], where the recently built castle completely collapsed, as did many other castles. Many people died in the principal hospital because almost all the roofs collapsed, as did other rooms in the said hospital. The hospitals of S.Pietro di Sassa, S.Spirito and S.Giacomo also collapsed. And after the earthquake had subsided for some days, to the extent that people dared return home, another terrible earthquake occurred on 17 December, but it did not cause any damage; but people set up tented camps again in the fields and squares. Then, on 3 and 4 January, there was another tremendous earthquake, that is to say a shock at about the fourth hour of the night on 3 January and on 4 January at the sixth hour, after which no-one dared return home. The friars who were at S.Giuliano when the first earthquake occurred took refuge in the forest, where some inhabitants also fled in fear, and after they had made a great fire with a large quantity of wood, the second earthquake occurred with such violence that all the wood in the fire was scattered round about. At this point, it was said, everyone was afraid that the earth would swallow them up for their sins, which were responsible for this scourge from God.

And so what Aquila escaped in 1456, when there was an earthquake and plague in the kingdom, now comes doubled. So look to yourself and fear God, lest you suffer a worse fate. During this second great earthquake on the first night, the clock bell in the *torre comunale* fell down, but it fell straight, with the result that the whole bell stuck into the ground towards the church of S.Francesco without being damaged. On the other hand, the court bell fell amongst the columns at the top of the tower and broke. And Francesco di Paola, a minorite, subsequently restored it [...] and I saw this bell with my own eyes. The clock bell was put back into position and struck on 9 January 1462. Similarly on 27 March there was an earthquake such that everyone was in fear, for people remembered the previous one, and this one occurred at the eighth hour of the night. On the above day, just before the third hour, there was another earthquake”.

Qualiter fuit terremotus in Aquila et quasi totam civitatem destruxit, et conservatum fuit sacramentum Eukaristie in Cappella Collismadij.

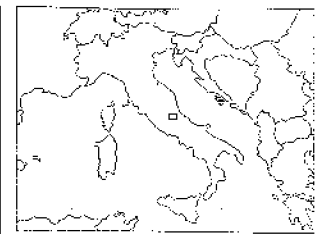
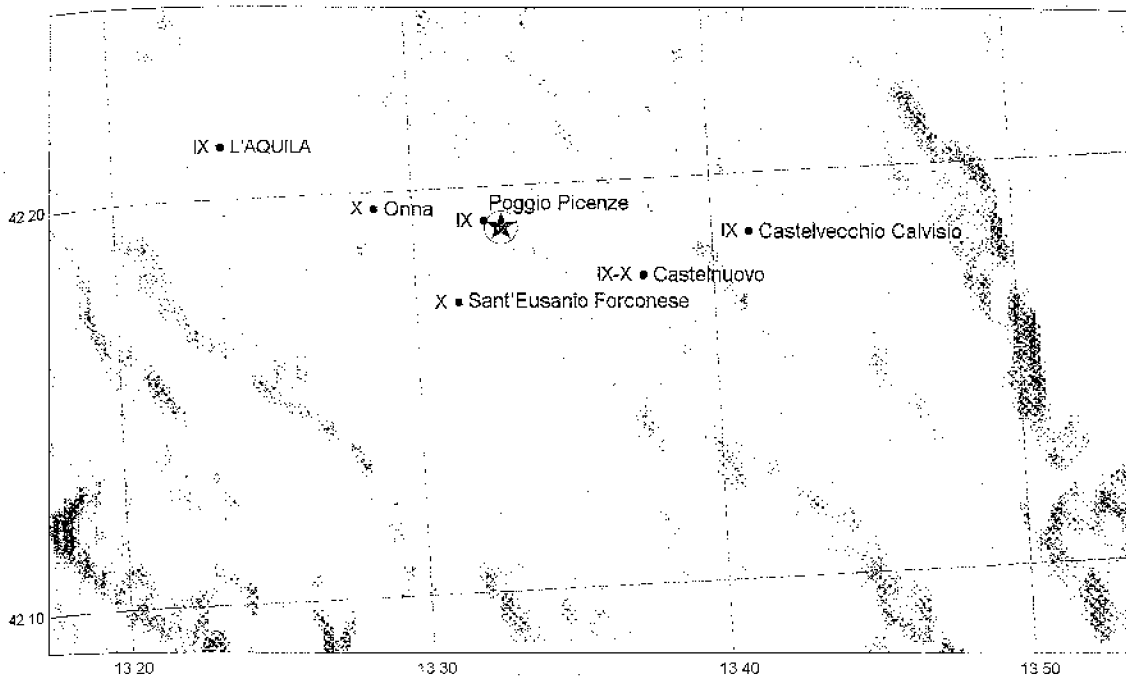
Anno 1461, in hora quinta noctis, fuit terremotus in Aquila, scilicet die quarta decembris, scilicet in nocte Sancte Barbare, propter quem omnes gentes surrexerunt de lectis suis et propter timorem alterius expectati terremotus, quilibet fugit aut in plateas aut in ortis et campis et creditur fuisse a deo inspiratum, quia parum damnum fecit iste primus terremotus. Sed eadem nocte, hora quasi decima factus est terremotus magnus qualis non est memoria scilicet sue terribilitatis, in quo omnia hedeftia ruerunt, et precipue ecclesie puta sanctum Bernardinum, et columnas que tenebant cuppulam, et cuppula non erat perfecta sed eretta erat usque ad principium rotunditatis, sed dejnne rehedificata est cum majoribus columpnis quam prius essent. Ruinate sunt etiam ecclesia Sancte Marie de Collemadio, scilicet tota tribuna maior in qua pendeat tabernaculum quadrum de cristallino et intus erat tabernaculum de argento cum tribus hostiis conservatis, et cadente tumba fractum est tabernaculum cristallinum et de argento; hostie vero immaculate conservate fuerunt inter lapides non opprimentes illas sed potius cooperientes quasi tumbicula manufacta, quod fuit singularissimum miraculum. Item ecclesia Sancti Maximi ruinavit et columna maius ecclesie eietta fuit. Item ecclesia Sancte Juste, Sancti Augustini, Sancti Dominici, Sancti Silvestri, Sancte Marie de Paganica et cetera multe. Hedeftia vero sic ceciderunt quod memo poterat transire per vias nisi super domos ruinas. Item palatium Capitani ruinatum fuit ubi duo milites oppressi fuerunt in capite sed magister actorum mortuus est cum uno

famulo iudicis. Inveni inronicis Franciscj Johannutij quod primus terremotus predictus fuit circa secundam horam, et secundus fuit in quinta hora noctis, ed die 27 novembris, sed puto illum errasse. Item duraverunt predicti terremotus plusquam diebus quindecim, et homines habitabant sub logijs et tegumentis de panno in predictis locis, et precipue in platea magna ubi dominus episcopus fecit altare ante ecclesiam, et ibidem fuerunt portate hostie predictae et per plures dies fuerunt cantate misse ibidem, et predicante fratre Johanne Albanesi, ordinis predicatorum, tantus namque erat timor quia quasi continue terra tremabat, idest sepe et sepiissime, quod nullus audebat pergere ad domum pro alimentis corporum, scilicet pane, vino et huiusmodi. In civitate igitur mortui fuerunt circa 80 persone, et in comitatu etiam, maxime in Sancto Osanio cuius castrum novum factum fuerat et totum ruinam passum est, et similiter plura alia castra. In hospitalj maiori plures mortui sunt quia ceciderunt quasi omnia lamia, et alia officina hospitalis predictj. Item hospitale Sancti Petri de Sassa et Sancti Spiritus et Sancti Jacobi ad terram cecidit. Et postquam tranquillavit dictus terremotus per aliquot dies, ita ut persone audebant reddere ad domos, die 17 decembris, venit alius terremotus terribilis, sed damnum non fecit, tamen gentes de novo refecerunt tentoria in campis et plateis. Postea, die 3a et 4a januarij, die vero 3a, fuit terremotus alius terribilis circa quartam horam noctis, et die 4a in hora sexta, propter quos terremotus nullus audebat in posterum reddere ad domos. Fratres qui erant in Sancto Juliano per primum terremotum exierunt in silvam ubi aliqui cives propter timorem fugerunt, et facto magno igne in silva appositis multis lignis, veniente secundo terremotu tam grandis fuit quod omnia ligna de igni hinc inde sparsit. Vere tunc temporis omnes timebant ut dicebatur ne terra deglutiret eos propter peccata quibus imputabant hoc fore flagellum dei. Et sic quod evasit, Aquila, in anno 1456 tempore terremotus regni et pestis, nunc duplicatum est tibi flagellum, igitur cave et time deum ne deterius tibi contingat. In hoc terremotu magno secundo prime noctis cecidit campana de riolo de tutti communitatis et cecidit recta unde quam tota intravit in terra versus ecclesiam Sancti Francisci, et nullum malum habuit. Campana vero justitie cecidit inter columpnas turris in alto et fracta est. Et deinde frater Franciscus Paulj de ordine fratrum minorum refecit illam, [...] et ego vidi hec de campana propriis oculis. Campana vero oriolis reposita fuit et pulsavit die 9 januarij 1462. Item die 27 martij fuit talis terremotus qualis dedit timorem toti populo recordante de preterito, et hic fuit 8.a hora noctis. In die vero predicta, quasi in hora tertiarum, fuit alius terremotus.

It will be noticed that the two principal surviving contemporary narrative sources are not in complete agreement as to the chronology of the strongest shocks. D'Angeluccio records two shocks of almost equal violence on 27 November, the first at the fifth hour of the night, "Italian time" (about 21:05 UT), and the second two hours later (about 23:05 UT). De Ritiis rejects this dating and puts the two shocks forward to 4 December in the following week, one at the fifth hour and the other at the tenth hour, "Italian time" (about 2:05 UT on 5 December), adding that the destructive shock was the second one, the first having caused only slight damage. But while De Ritiis depends on D'Angeluccio for his description of the damage, he conveys his source's chronological information inaccurately when criticising it; for he claims that Francesco D'Angeluccio placed the first shock at the second hour of the night, "Italian time", and the second at the fifth hour, thus reversing the time of the shocks and turning the gap between them into an absolute indication of the time of the first one. However, his proposed chronology proves to be rather unreliable not only on grounds of textual criticism but also because numerous other sources, which are quite independent of D'Angeluccio, confirm the chronology criticised by De Ritiis. We have therefore accepted the chronological suggestions set out by D'Angeluccio.

Angelo Tummolillo, a contemporary chronicler, mentions in passing the effects of the earthquake in San Germano (Cassino):

"CXII. On another earthquake after the first in the region of L'Aquila. On Friday 27



1461
November 27

fig. 128

December [1461], in the tenth indiction, there was an earthquake at the fifth hour of the night. It was weak here but strong in the region of L'Aquila. Many buildings collapsed there and about a hundred people perished. Similarly, at Castelvecchio, it caused many houses to collapse and killed twelve people".

CXII. De alio terremotu post primum in partibus Aquile. Die vero veneris ad quinque horas noctis XXVII decembris X indictione factus est terremotus, in istis partibus remissus, set in pertinentiis Aquile vallidus. Excorruerunt ibidem multa edificia et fuerunt oppressi circa centum homines ibidem. Et similiter in Castroveteri subversit multas domos et occidit circa XII homines.

Amongst non-local contemporary sources, the continuation of Filippo di Cino Rinuccini's chronicle by his son Alamanno, covering the years 1461-1499, is the only one to indicate the duration of the two shocks on 27 November 1461:

"Earthquake at L'Aquila. On 27 November at the fifth hour of the night L'Aquila was struck by a very great earthquake which lasted the time it takes to recite the Lord's Prayer three times [about 36 seconds] and the Hail Mary three times [about 24 seconds], and shortly afterwards there was another which lasted the time it takes to say the Lord's Prayer once [about 12 seconds], and they caused the collapse of two thirds of the houses in the city, and there were more than 100 victims, and there was one house where 9 people died, and it was so great that it caused serious damage to many church and other buildings, and people slept in the fields in huts and tents".

Tremuoto all'Aquila. A di 27 di Novembre a ore 5 di notte venne all'Aquila un tremuoto grandissimo che durò per spazio di dire tre paternostri e tre avemarie, e indi a poco ne venne un altro che durò del dire un paternostro, e feciono cadere due terzi delle case della città, e morivvi più di 100 persone, che vi fu casa ve ne morì 9, e simile guastò molti edifici di chiese ed altro con grandissimo danno, e stavano gli uomini a dormire a campo con trabacche e tende.

In Paolo dello Mastro's contemporary diary about the city of Rome, we find the following: "In 1461, on 27 November, which was a Friday, at the third hour of the night, as

Saturday approached, there was so great an earthquake that the bell of S.Marcello rang out three times, and a little while later it rang out four times”.

Nelli 1461, a di 27 di novembre, e fu di venerdì, alle tre hore di notte venne lo sabbato, fu lo terremoto, e fu sì granne, che fe' sonare la campana di san Marcello tre tocchi, e poi in po di spatio la fe sonare quattro tocchi.

The fact that he gives a different time from the other sources may be the result of a copying error rather than a mistake by the diarist, for the printed edition of the diary is not based on the autograph manuscript, which has been lost. Information about Perugia comes from Pompeo Pellini, a local 16th century chronicler:

“and finally they say that in this year [1461], both at L'Aquila [...] and Perugia there were earthquakes, but that at the first of these there was serious damage, but none at the second”.

vogliono ultimamente, che di quest'anno, et nell'Aquila [...] et in Perugia fossero terremoti, ma che in quella [...] molti danni ne seguissero, et in questa nessuno.



1461 11 16

localities	lat.	long.	I
L'Aquila	42 21	13 24	F

1461 11 27 21:05 UT ☉ = 42 19 13 33 I₀ = X Me = 6.3 Sites: 9

localities	lat.	long.	I	localities	lat.	long.	I
Onna	42 20	13 29	X	Poggio Picenze	42 19	13 32	IX
S.Eusanio Forconese	42 17	13 31	X	Rome	41 54	12 29	V
Castelnovo	42 18	13 38	LX-X	Perugia	43 06	12 23	F
Castelvecchio Calvisio	42 19	13 41	IX	Cassino	41 29	13 50	III-IV
L'Aquila	42 21	13 24	IX				

1461 12 11 c. 100 shocks

localities	lat.	long.	I
L'Aquila	42 21	13 24	F

1461 12 18 0:10 UT

localities	lat.	long.	I
L'Aquila	42 21	13 24	NC

1462 01 03 20:25 UT

localities	lat.	long.	I
L'Aquila	42 21	13 24	V

1462 01 04 22:25 UT

localities	lat.	long.	I
L'Aquila	42 21	13 24	V

1462 03 27 2:00 UT

localities	lat.	long.	I
L'Aquila	42 21	13 24	V

1462 03 27 21:00 UT

localities	lat.	long.	I
L'Aquila	42 21	13 24	F

< 333 > 1462 Lepanto [Greece]

source Suriano, *Il Trattato*, p.219

This earthquake is unknown to the seismic catalogue tradition.

In 1462, an almost continuous sequence of earthquakes struck Lepanto (present-day Nafpactos), causing many *palazzi* and houses to collapse, and severely damaging the port as well. This sequence of earthquakes is recorded by Francesco Suriano, a Venetian nobleman who subsequently became a Franciscan friar and was actually at Lepanto at that time. He was then barely twelve years old, and was on his first voyage to the East on one of his uncle's merchant ships. Suriano reports:

"About the year of Our Lord 1462, I happened to be in the town of Lepanto, and not finding a way of crossing the Gulf of Patras, where St. Andrew was martyred, and continuing our journey on land to Negroponte [the island of Euboea], there were some almost continuous earthquakes of such power, especially at night, that the whole foundations of the port fell into the sea. And many *palazzi* and houses collapsed".

Circa li anni del Signore mille quatrocento[62], ritrovandome in la città de Lepanto, e non potendo passare per fortuna el golpho de Patras, dove fo martyrizzato sancto Andrea, e seguitare per terra el nostro viaggio de Negroponte, eran sì terribil teremoti quasi de continuo, e maxime la notte, che tutte le fundamenta del porto caderono nel mare. E molti palaci e case cascarono.

There are some variants in the first version of Suriano's work, written in 1485:

"In the year of Our Lord 1462 I was in Greece, at the city of Lepanto, which belongs to the *Signoria* of Venice; we remained in that city for eight days, because the bad weather prevented us from continuing our journey to Negroponte [the island of Euboea]. We stayed in the Captain's *palazzo*, and there was an almost continuous... earthquake...".

Nelli anni del Signore 1462 ritrovandome nella Grecia, nella città del Lepanto et quella della Signoria de Venetia; staendo in quella VIII dì per li maltempi et non potendo andare et seguitare lo viaggio nostro de Nygroponte, habitammo in lo palazzo del Capitano, era quasi continuo [...] il terremoto [...].

▲ 1462

localities	lat.	long.	I
Nafpactos	38 24	21 50	VIII-IX

< 334 > 1463 Cyclades islands - Aegean Sea [Greece]

> emergence of new island <

source Suriano, *Il Trattato*, p.219

This earthquake and the emergence of the island of Kameni are unknown to the seismic catalogue tradition. The new island is described as being about 8 km (5 miles) long.

In 1463, an earthquake described as "terrible" struck the islands of the Cyclades, archipelago in the Aegean Sea, particularly affecting Santorini (now Thera), and probably Ios. The source gives the toponym *Scio*, which seems to suggest the island of Chios. However, in our opinion, there are geographical reasons for thinking it likely that the reference is to Ios, very near Thera, rather than the island of Chios, which is close to the Turkish coast. This earthquake is recorded by Francesco Suriano, a Venetian nobleman who subsequently became a Franciscan friar:

"Similarly, the following year [1463], in the [Cyclades] archipelago, there was such a terrible earthquake that the islands of Scio and Santorini and all those nearby shook

so much that they could not remain standing; and the islanders say that they thought it was the end of the world. And in the morning, they saw that an island five miles long had been created nearby, and they called it Chaimeni”.

Item, l'anno sequente, ne lo arcipelago venne sì terribile terremoto, che l'isola de Scio e de Santorini, con tutte le adiacente, tremavano in tanto che non potevano stare in piedi; credendo firmamente, sì come dissero li habitanti in esse, fosse la fine del mundo. E la mattina videro nata una insola appresso loro, longa cinque miglia, e posenli nome Chaimeni.

▲ 1463

localities	lat.	long.	I	localities	lat.	long.	I
■ los island	36 44	25 16	V-VI	■ Thera island	36 24	25 26	V-VI

< 335 > 1465 April 7 Po Plain [northern Italy]

- inscription graffito on the walls of the loggia of the castle at Montechiarugolo, in Dall'Acqua (1976, p.72)
- sources 2 BPalatina, Parma, *Mss. Parm.*, 459, *Cont.*, in Edoari de Erba, *Miscell.*, fol.339; BMPanizzi, Reggio Emilia, *Mss. Regg.*, C.29-30, Azzari, *Cron.*, fol.197; *Mss. Regg.*, C.45, Azzari, *Hist.*, II; Rizzoni, *Mem.* (p.224)
- historiography Pezzana (1837-59); Poncini (1883-84); Sormani Moretti (1904); Aleotti (1916)
- catalogues d. Goiran (1880); Reginus (1880); Benassi (1899); Baratta (1899; 1901); Milne (1911); Guidi (1915); *Boschi *et al.* (1995, 1997, 2000)
- catalogues p. Giorgetti and Iaccarino (1971); Carrozzo *et al.* (1973); Postpischl (1985); CPTI (1999)

On 7 April 1465, at about 15:30 UT (the twenty-first hour, "Italian time") an earthquake struck Reggio nell'Emilia, causing the collapse of chimneys on the town hall. At Montechiarugolo, which lies about 15 km south east of Parma, the shock was described as "terrible" (*horibilis*); at Parma it frightened people listening to a sermon, and at Verona it caused people to flee from churches. A slight shock was also felt at Lucca. There is a record of this earthquake in two contemporary sources: writing scratched on the walls of the loggia of the castle at Montechiarugolo (published in Dall'Acqua (1976, p.72) and the *Diario* of Ruberto da Portico (recorded in Guidi's catalogue, 1915, p.25). They give a precise dating to 7 April, Palm Sunday, and so make it possible to correct chronological inaccuracies in later accounts. In the case of Montechiarugolo, information about the earthquake comes from an unusual source:

■ – a graffito on the walls of the loggia of the local castle. The transcription given below (with gaps) is that published by Dall'Acqua (1976, p.72):

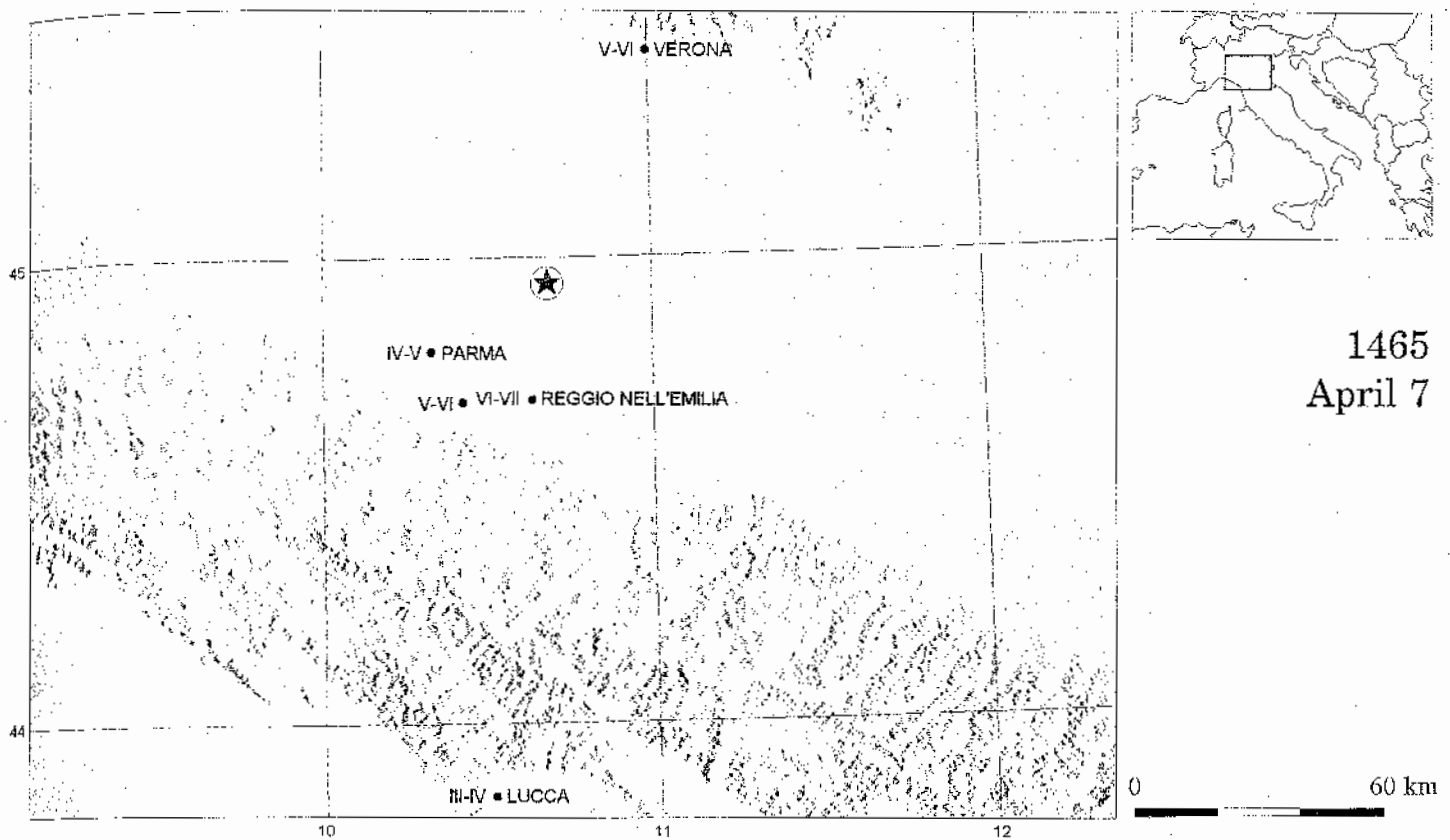
"On the seventh day ... which fell on Palm Sunday [in 1465], there was a terrible earthquake at about the 21st hour".

Die sette ... que cecidit die palmarum fuit hic tremotus horibilis hora 21 in ... vel circa.

Although this source does not record any particular effects, the very fact that it describes the earthquake as *horibilis* and gives the time of its occurrence, suggests that it made a deep impression on the writer and was probably of considerable intensity. The other contemporary source is recorded in Guidi's catalogue (1915, p.25), his information coming from the *Diario* of Ruberto da Portico, a writer who lived at Lucca: "1465. 7 April. There was a small earthquake on Palm Sunday".

1465. Addì 7 Aprile. Ci fue un tremuoto piccolo, et fue in Domenica di Ulivo.

The shock is mentioned by the 16th century chronicler Giacomo Rizzoni in his *Memorie istoriche* as having affected Verona:



1465
April 7

fig. 129

"In the year 1465, on 6 April, there was a great earthquake. It happened on Palm Sunday during the sermon, with the result that everyone fled from the church, and there was a great tumult".

L'anno 1465 adì 6 de Aprile trasse un gran teremoto, et fu in dominica da l'Oliivo in la Hora che se predicava, per tal modo che ogni homo fuziva fora de chiesa, et fu gran strepito.

Since the chronicler mentions Palm Sunday, the date of the earthquake obviously has to be corrected from 6 to 7 April. It must also be kept in mind that Baratta (1901) wrongly gives his own source as Pier Zagata when in fact it was Rizzoni's work. The latter was published by Biancolini in 1747 together with that of Pier Zagata, and the two are often confused. Information about Parma is to be found in manuscript notes added to Giovanni Cornazzano's chronicle to bring it up to 1527. They are preserved in the *Miscellanea storica di cose Parmigiane* by Angelo Mario Edoari de Erba (Biblioteca Palatina, Parma, *Mss. Parm.*, 459, fol.245), where we read:

"1465: 7 April. There was a great earthquake while a certain Friar Sebastiano da Bagnacavallo was preaching in the church of S.Francesco. Everyone was struck with bewilderment during the sermon".

1465: 7 Aprile. Fu si gran teremotto predicando un certo Frate Sebastiano da Bagnacavallo in S.Francesco che ognuno si smarri in quella predica.

As regards Reggio nell'Emilia, an examination of local historiographical works reveals that a chronicle compiled by Fulvio Azzari, who lived in the second half of the 16th and the early 17th century, is closest in time to the event, and mentions an earthquake on 15 April 1465, adding the curious detail of the naked fleeing *podestà* (Biblioteca Municipale "A.Panizzi", Reggio Emilia, *Manoscritti Reggiani*, C.29-30, fol.197):

"On 15 April [1465] at about the 20th hour, such an earthquake was felt in Reggio that it caused the clock bell to ring uninterruptedly of its own accord for six hours. The chimneys on the *palazzo* [town hall] fell down, and the extraordinary thing was that the *Podestà* was seen naked in the square, for his fear that the *palazzo* would collapse on top of him had left him no time to put on his shirt".

Il 15 d'Aprile circa le 20 hore si sentì un tal terremoto in Reggio, che per sei hore continue fece da sé stessa sonar la campana dell'orologio. I camini del Palazzo caddero; è quello, che fù notabile, si vidde il Podestà nudo in piazza che per la tema non li cadesse addosso il Palazzo, non s'era dato tempo di porre la camiscia.

In our opinion, the date 15 April given in this chronicle should be amended to 7 April, because the time indicated (the twentieth hour) fits that recorded in the scratched words at Montechiarugolo (the twenty-first hour). The latter source dates the earthquake to 7 April, and the immediacy of the note renders it trustworthy. A difference of one hour between different authors at this period is in fact fairly common and not significant. Because of the dating problems in the sources which record this earthquake, it has been received into the seismological tradition as a doublet: one event on 6 April and the other on 15 April 1465. On the basis of the considerations set out above, we think that there was in fact one earthquake, on 7 April 1465, that it occurred in the Reggio area, and that it had a deep hypocentre, since it was felt at Verona, which is a long way from the epicentral area.

▲ 1465 04 07 15:30 UT		★ = 44 57 10 41		Io = V-VI		Me = 4.7		Sites: 5	
localities	lat.	long.	I	localities	lat.	long.	I		
Reggio nell'Emilia	44 42	10 38	VI-VII	Parma	44 48	10 20		IV-V	
Montechiarugolo	44 42	10 25	V-VI	Lucca	43 51	10 30		III-IV	
Verona	45 26	11 00	V-VI						

< 336 > 1466 January 15 Irpinia [southern Italy]

- sources 1 Eight letters from Naples published or quoted in Figliuolo and Marturano (1996): Sforza Ippolita, 15 January 1466, doc.1, pp.106-7 (also in Motta 1887, pp.154-5); Sanseverino Roberto, 16 and 25 January 1466, doc.2, p.107, doc.4, p.108, doc.6, p.109; Sanseverino Giovanna, 16 January 1466, doc.3, p.108; Antonio da Trezzo, 22 January 1466, pp.94-5; Malatesta da Crema 23 January 1466, doc.5, p.109; Antonello Faccipecora, 26 January 1466, p.95; *Ann. de Raimo*, col.234; Della Morte, *Cron.*, p.113; Tummolillo, *Notab.*, p.138; *Cron. Ramp.*, IV, pp.349-50; *Cron. Varign.*, IV, p.349
- sources 2 Ghirardacci, *Dello hist.*, p.190
- archaeol. liter. Rotili (1992, 1996a, 1996b, 1997, 1998)
- historiography Motta (1887)
- literature Figliuolo and Marturano (1996)
- catalogues d. Bonito (1691); Perrey (1848); Mallet (1853); Capocci (1861); Mercalli (1883); Baratta (1901)
- catalogues p. Giorgetti and Iaccarino (1971); Carrozzo *et al.* (1973); Postpischl (1985)

History of the earthquake's interpretation

This earthquake has been underestimated by the seismological tradition, and is omitted from the most recent parametric catalogues (NT4.1 1997 and CPTI 1999). In the case of the CFTI catalogue (Boschi *et al.* 1995, 1997 and 2000), its absence is due to the fact that it was classified in the previous catalogue (Postpischl 1985) with an intensity threshold of grade VII-VIII on the MCS scale, which is below the CFTI threshold for central and southern Italy.

The earthquake has been known to historical seismology since Bonito (1691), and is recorded in the later catalogues of Perrey (1848), Mallet (1853) and Capocci (1861), the sole source for all of them being the *Annales de Raimo* (ed. 1733), according to which the earthquake struck the Principato Citra region — corresponding to the present-day province of Salerno — particularly affecting the villages of Buccino, Pescopagano and Conza, and also being felt in Naples, but without causing damage there. The earthquake was subsequently listed in Mercalli's catalogue (1883), which repeated information recorded by Capocci (1861).

In addition to the above source, Baratta (1901) made use of a letter written in Naples by Ippolita Sforza to her mother Bianca Maria Visconti on 15 January 1466, and published by Motta (1887). To the previously known information this source adds that the earthquake was felt at Capua.

Baratta (1901) is the bibliographical reference used by later 20th century parametric catalogues: Giorgetti and Iaccarino (1971), Carrozzo *et al.* (1973), and Postpischl (1985). All these catalogues date the earthquake to 14 January 1466. As regards the time of day, Carrozzo *et al.* (1973) give 1:00, converting the ninth hour "Italian time" to UT, but without altering the date to 15 January; whereas Postpischl (1985) gives 21:00 (without converting to UT). These parametric catalogues use the same base data, and place Buccino at the epicentre. In Giorgetti and Iaccarino (1971) and Carrozzo *et al.* (1973) the epicentral intensity is given as grade VI on the MSK scale, while Postpischl (1985) gives grade VII on the MCS scale.

Figliuolo and Marturano (1996) have studied this earthquake using the sources given by Baratta and adding other letters, chronicle and documentary sources; thanks to these two authors, important new sources of information have been published: but their study does not assess effects for each locality.

We have added to the picture of territorial effects by means of research into archaeological literature on the area (Rotili 1992, 1996a, 1996b, 1997, 1998).

This earthquake makes an important contribution to our understanding of strong earthquake return periods in the Apennine area.

Effects of the earthquake

The earthquake struck at about 2:25 UT (three quarters of the way through the ninth hour of the night, "Italian time") on 15 January 1466, affecting an area of the southern Apennines on the borders of the present-day provinces of Salerno, Avellino and Potenza. The shock was felt for a long time in Naples (some thought it lasted for as long as a *Miserere*, i.e. about 65 seconds).

The worst affected villages, where building collapses killed dozens of people, were Conza della Campania (20 victims), Calabritto (24 victims) and Teora (13 victims). 15 houses collapsed in the earthquake at Calitri; and there was serious damage at Pescopagano, involving 13 victims, including the feudal lord of the village and his wife, who perished in the collapse of the castle. There was also serious damage and more victims (numbers not specified) in ten or more other villages: Balvano, Buccino, Caposele, Colliano, Laviano, Muro Lucano, Oliveto Citra (the Prince of Salerno, who was passing through the village, survived the collapse of the building where he had lodgings), Palomonte, Quaglietta, Ricigliano, Ruvo del Monte, San Gregorio Magno, and Vallata. There was also unspecified damage at the villages of Acerno, Cairano, Lioni, Santomenna and Sant'Andrea di Conza.

In addition to examining chronicle and documentary sources, we also took into consideration the results of a number of archaeological investigations carried out in the area. They offer evidence of damage attributable to the earthquake in the area of the medieval castle of Rocca San Felice, the early Romanesque cathedral of Sant'Angelo dei Lombardi and the castle of Candriano at Torella dei Lombardi (see below).

There was no damage at Naples, but the earthquake was strongly felt there, and the

terrified inhabitants fled from their homes. The inhabitants of Capua were equally terrified, and one person was killed there as he attempted to flee. One can deduce indirectly from the sources that there was no damage at Caiazzo, Nola, and probably Monteverde, where king Ferrante of Aragon and his court were staying: they returned to Naples on 22 January, having slept out in the open for about a week. Being mindful of the earthquake of ten years earlier, the people of Naples took to tents and shacks. The archbishop of Naples organised a procession on the day of the earthquake.

Historical sources

This present study is thus based on contemporary chronicle and documentary sources, with additional archaeological evidence. Its results allow us to establish a more accurate general picture of the earthquake, and to estimate both its epicentral intensity and the extent of the damage zone. Its effects prove to be considerably greater than previous estimates suggested.

LETTERS AND DESPATCHES

As regards documentary sources, Baratta (1901) was already aware of the letter, now in the Sforza Collection in the Milan Archivio di Stato, written by Ippolita Sforza, duchess of Calabria, to her mother Bianca Maria Visconti, duchess of Milan. By broadening their search in the same archives, Figliuolo and Marturano (1996) found another 5 letters written to the duke and duchess of Milan between 16 and 25 January 1466. These letters were written by Roberto Sanseverino, his wife Giovanna Sansoverino, (respectively count and countess of Caiazzo and relatives of the Milanese ruling family), and Antonio da Trezzo, Milanese ambassador in Naples. They are particularly concerned with earthquake effects in Naples and the reactions of the inhabitants, and they also mention other localities on the edge of the damage zone.

There are two diplomatic despatches in the Gonzaga Collection in the Mantua Archivio di Stato which contain information about the January 1466 earthquake. They are addressed to Barbara Gonzaga, marchioness of Mantua and to Luigi III Gonzaga, marquis of Mantua, by their agents Malatesta da Crema (23 January 1466) and Antonello Faccipicora (26 January 1466).

Set out below are the most significant passages of some of the above-mentioned letters and the two despatches.

The letter from Ippolita Sforza to her mother Bianca Maria Visconti was written on 15 January 1466, the day on which the earthquake occurred:

“On 14 of this month, which was a Tuesday, three quarters of the way through the ninth hour of the following night, there was an earthquake at Naples and Capua and everywhere round about, lasting as long as a *Miserere*. No harm was done to houses or people, but all the inhabitants were terrified because of the harm they suffered on the previous occasion [in 1456]. [...] God knows how frightened I was [...]. And I immediately sent to Nola to see what had happened to my noble husband, and he did the same about me; [...] and I learned that by the grace of God the earthquake had not done any damage anywhere. Then when day came, the archbishop went round the city with a very large and devout procession. And at the twenty-first hour, by which time my lord had returned, we went to lodge in a garden cottage, where we would be quite safe [...]. I can tell you that even in the midst of all that fright, there was a great deal of laughter [...]. From Castelcapuano, 15 January 1466. [...] Ippolita Maria d'Aragona”.

A XIII^o dì del presente mese, che fo martedì, ad hore VIII^o et tri quarti dela nocte sequente, è stato a Napoli et a Capua et a tutti hi lochi circostanti el terremoto, per spatio de uno miserere el quale né de case né de persone non ha facto danno alcuno, ma ha facto grandissima paura a tutti hi popoli per el male receuto a l'altra volta. [...] la paura che io ho hauta Dio el sa [...]. Et incontinente mandai a Nola a vedere che era del

mio illustrissimo consorte, et così lui mandò a veder me; [...] et intesi che, per la gratia de Dio, non haveva facto danno in alcuno loco. Poi, facto el giorno, lo arcevescovo andò per la città con una devota et grandissima processione. Et a XXI hora, tornato el mio signore, siamo andati ad habitare in una casetta del giardino, ove staremo securissimi [...] Avisandola che etiam in questa paura sonno state mille risa [...] Ex Castro Capuano, die XV Ianuarii 1466. [...] Hippolyta Maria de Aragonia.

On 16 January 1466, the day after the earthquake, count Roberto Sanseverino wrote two letters, the first of which was addressed to Bianca Maria Visconti:
"I have to inform you [...] that on the 14th day of this month, shortly before the tenth hour, there was a very great earthquake, which threw us into great fear and caused us to leave our houses and seek greater safety in squares, where we set up tents, in which we still sleep. And although the earthquake lasted longer than on the other occasion [in 1456], it did not cause any damage, for which God be praised, for in his clemency he saved us from this great peril. [...] Naples, 16 January 1466. [...] Roberto, count of Caiazzo.

notifico [...] como a' giorni XIII^o del presente, ad hore VIII^o venendo le X, ebbemo duo grandissimo taramotto, del quale ebbemo grande spavento, per modo uscitemo fuora delle proprie case, riducendo ale piacie per più nostra tutela, facendo piantare li pavioni, dovi per in sino ad ora dormiamo. Et quantoncha corresse più tempo non fece l'altra fiata, non ha però fato danno alcuno, del che Dio sia laudato, quale per sua clementia ci à cavato di tanto periculo. [...] Neapolis, die XVI Ianuarii 1466. [...] Robertus, comes Cayacie.

Roberto Sanseverino's second letter was addressed to Francesco Sforza:
"on the 14th day of this month, shortly before the tenth hour, we had a strange and frightening earthquake, which lasted longer than on the previous occasion [in 1456]; but it did no damage, by the grace [of God]. Nevertheless it frightened us all greatly, so we came out of our houses and ran into the squares, where we had tents put up for our safety. And so far we have slept in these tents to avoid danger. [...] Naples, 16 January 1466. [...] Roberto of Aragon of San Severino, count of Caiazzo".

a dì XIII^o del presente, ad hore VIII^o venendo le dece, ebbemo uno stranio e spaventoso taramotto, el quale tene più spatio di tempo non fece l'altra fiata; non fece però danno mediante la gratia. Nondimeno, fece a tuti nuy grandissima paura, uscendo fuora delle proprie habitatione e correndo ale piacie, per nostra secureza facendo piantare li pavioni. E per insino ad hora havemo dormito sotto li dicti pavioni, per uscire di periculo. [...] Neapolis, die XVI Ianuarii 1466. [...] Robertus de Aragonia de Sancto Severino, comes Cayacie.

On that same 16 January 1466, Roberto Sanseverino's wife, Giovanna, also wrote to Bianca Maria Visconti:

"on the 14th, as night approached the 15th of this month, between the 9th and 10th hours, there was a most terrible earthquake here, which caused more fright than damage, for there was no damage at all here, except that someone jumped from a terrace in fright and was killed. Nevertheless, out of fear of future harm, yesterday evening [...] tents were set up in the garden of your noble daughter at Castelcapuano, where I slept, together with [...] my husband and my little children. Naples, 16 January 1466. [...] Giovanna of Aragon of San Severino, countess of Caiazzo [...]"

a XIII^o, la nocte venendo li XV del presente, tra le VIII^o et X hore, fo qui uno terramoto terribilissimo, il quale ne ha facto più paura che dano, perché qui non ha facto dano alchuno, salvo uno chi per paura s'è butà zuso da uno astrego et morite. Non di meno, timendo il male futuro, heri sira [...], fo piantato li padiglioni in el zardino de la illustrissima vostra figliola in Capuana, dove dormite io, il [...] mio consorte et li mey

figliolini. Et cusì in quello havemo disnato cum piacere asay. Per questo vostra excellentia non ha a prendere alchuno affano. Ala quale di continuo m'aricomando, avisandola che sabato [che] vene se partiremo per andare a Cayaza. Neapoli, XVI Ianuarii 1466. [...] Iohanna de Aragonia de Sancto Severino, comitissa Cayacie [...].

Ten days after the earthquake, on 25 January, Roberto Sanseverino wrote to Bianca Maria Visconti again, informing her of the worst affected places. Unfortunately, the appendix to the letter containing this information has not survived.

On 22 January, Antonio da Trezzo, the Milanese ambassador in Naples, sent a letter to Bianca Maria Visconti, duchess of Milan, from which we learn that king Ferrante of Aragon had

“wandered around [...] through fields and vineyards in order to avoid lodging in walled places out of fear inspired by the earthquake, for that was indeed great”.

andato vagando [...] per campagne et vigne, per non alozare in terre murate per timore del terremoto, quale è stato pur grande.

Of particular interest is the despatch sent to Barbara Gonzaga on 23 January 1466 by Malatesta da Crema, the Mantuan ambassador, for it contains a list of the places which suffered most damage. This list probably derives from an official damage report circulated amongst ambassadors in Naples, and it lists 17 places as having suffered damage, 7 of which are not recorded in the other sources:

“the earthquake which occurred on the 14th of this month, [...] and which did no damage here, was responsible for a great deal of damage in the villages listed below, to the extent that there are no survivors in some of them. These villages are situated in the Principality and in Apulia. [...] Buccino, Quaglietta, Balvano, Ricigliano, Laviano, Colliano, Oliveto Citra, Caposele, Calitri, Pescopagano, Ruvo, Muro, Palo, San Gregorio, Vallata, Calabritto, Teora”.

el teremotto che adì 14 del presente vene qui [...], et che non havea fatto danno alcuno, ha facto danno inextimabile ale infrascripte terre, e in modo che in alcuna de quelle non gli è rimasto persona viva. Le qualle terre sono poste in Principato et in Puglia. [...] Bucino, Qualetta, Balbano, Ronceglao, Laviano, Cheoglano, Lovito, Capossella, Coalitri, Petrapagana, Ruvo, Muro, Palo, Sancto Gregorio, Valita, Calabrito, Theora.

Since the despatch sent to Luigi III Gonzaga on 26 January 1466 by Antonello Faccipicora, the agent of Mantua, is expressed in much more general terms, we do not reproduce it.

CONTEMPORARY CHRONICLES

As far as chronicle sources are concerned, we have found that contemporary writers in southern Italy paid little attention to this earthquake, probably because of its proximity in time and place to the great earthquake of December 1456.

As mentioned above, the earthquake is mentioned briefly in the *Annales de Raimo*:

“In the year 1466 on the night of Tuesday 14 January at the ninth hour there was a very great earthquake which lasted as long as it usually takes to recite a *Miserere*; and by the grace of Almighty God no harm was done in the city of Naples. But in the Principato Citra [the present-day province of Salerno], the villages of Buccino, Pescopagano and Conza were damaged, as well as other villages”.

Anno 1466. a' 14. di Genaro di Martedì a notte a' 9. ore fu un grandissimo Terremoto, che durò più d'un Miserere, dicendosi per uso; e per la bontà di Dio onnipotente nullo male succedé nella Città di Napoli. Ma il Principato Citra, e più Terre foro guaste, Bocino, Piescopagano, Consa, et altre Terre.

Of the other Neapolitan chronicle sources, only Giacomo della Morte, known as Notar Giacomo, makes a brief reference to the earthquake in his *Cronica* (ed. 1845), men-

de Puglia, et prima: Consa città, morigli xx persone, Thedora città, morigli xviii persone, Pestechio, Passano, morigli xiii persone, dove ruinò la rocha e morì el signore e la donna soa in letto, Sancto Andrea, Caierano, San Mondachio, Capastelle, Lovetto, dove quella notte era l'officio el principio de Salerno, e chascogli adosso case; e per la gratia de Deo, campò. El quale venìa da vixitare la maestà del re Ferante, Coffriano, Palu, Calitri, ruinato case xv, Callabretto, morigli persone xxiii, Accera e Lione, Vallata.

Some of the place names appear in a corrupt form in the text: *San Mondachio* may be a reference to Santomenna, *Lovetto* to Oliveto Citra, and we think that *Pestechio* and *Passano* (not identified in Figliuolo and Marturano 1996) may refer to the one place Pescopagano. Both the Bolognese chronicles are slightly inaccurate in dating the earthquake to February 1466, but this may be attributable to the time it took for news of it to reach northern Italy.

ARCHAEOLOGICAL LITERATURE

Archaeological research has suggested that damage at the following three locations may be attributable to the earthquake: Rocca San Felice, Sant'Angelo dei Lombardi and Torella dei Lombardi. All three are near places that we know from written sources to have been damaged; and the published studies are extremely well documented. Archaeological excavations carried out at the medieval castle at Rocca San Felice have produced evidence of collapses and repairs to roofs and masonry in service areas annexed to the main building, dating to the mid-15th century (Rotili 1992, 1996a, 1996b, 1998). Archaeological excavations carried out at the early Romanesque cathedral of Sant'Angelo dei Lombardi have shown that the building — which had already been repaired in the 14th century — suffered further serious damage datable to the middle of the next century (Rotili 1996a, 1996b, 1998). Archaeological excavations carried out at the medieval castle of Candriano at Torella dei Lombardi have produced evidence of collapses and the reconstruction of vaulting, arches and masonry dating to the 15th – 16th century (Rotili 1997, 1998).

▲ 1466 01 15 2:25 UT		★ = 40 46 15 20		Io = VIII-IX		Me = 6.1		Sites: 31	
localities	lat.	long.	I	localities	lat.	long.	I		
Calabritto	40 47	15 13	VIII-IX	San Gregorio Magno	40 39	15 24	VIII		
Conza d. Campania	40 52	15 20	VIII-IX	Vallata	41 02	15 15	VIII		
Teora	40 51	15 15	VIII-IX	Acerno	40 44	15 03	VII-VIII		
Balvano	40 39	15 31	VIII	Cairano	40 54	15 22	VII-VIII		
Buccino	40 38	15 23	VIII	Lioni	40 53	15 11	VII-VIII		
Calitri	40 54	15 26	VIII	Rocca San Felice	40 57	15 10	VII-VIII		
Caposele	40 49	15 13	VIII	Santomenna	40 48	15 19	VII-VIII		
Colliano	40 44	15 17	VIII	S.Andrea di Conza	40 51	15 22	VII-VIII		
Laviano	40 47	15 18	VIII	S.Angelo d.Lombardi	40 56	15 11	VII-VIII		
Muro Lucano	40 45	15 29	VIII	Torella dei Lombardi	40 56	15 07	VII-VIII		
Oliveto Citra	40 41	15 14	VII	Caiazzo	41 11	14 22	V		
Palomonte	40 40	15 18	VII	Capua	41 06	14 13	V		
Pescopagano	40 50	15 24	VII	Monteverde	41 00	15 32	V		
Quaghetta	40 45	15 14	VIII	Naples	40 51	14 16	V		
Ricigliano	40 40	15 29	VII	Nola	40 56	14 32	V		
Ruvo del Monte	40 51	15 32	VIII						

< 337 > 1467 December 14-15 Cairo [Egypt]

sources Ibn Taghribirdi, *Hawadith*, VIII, p.616; Ibn Iyas, *Bada'i*, II, p.471
 catalogue d. *Ambraseys et al. (1994)

During the night of 14-15 December 1467, a minor shock at Cairo caused some old buildings to collapse. Information about the earthquake can be found in the works of two contemporary Arab historians, Ibn Taghribirdi and Ibn Iyas, both of whom provide very similar information. Ibn Taghribirdi writes:

"During the night of Tuesday [17 *Jumada I* 872 H. = 15 December 1467], new Cairo was struck by a minor earthquake which caused few dwellings to collapse".

و في ليلة الثلاثاء زلزلت القاهرة زلزلة خفيفة سقط منها أماكن قليلة.

Ibn Iyas records:

"In that month [*Jumada I*], during the night of 17, a minor earthquake occurred at Cairo, causing some old buildings to collapse".

و فيه في ليلة سابع عشره، وقع بالقاهرة زلزلة خفيفة، و سقط منها بعض أماكن عتيقة.

Ambraseys *et al.* (1994, p.102) give it an epicentral intensity of class F, which is equivalent in their classification to a range from felt to strong (up to grade VI MSK).

▲ 1467 12 14-15 at night

localities	lat.	long.	I
Cairo	30 03	31 15	VI

< 338 > 1468 June 6 Romagna? [northern Italy]

sources 1 BNFrance, *Mss. latins*, 3727, fol.95v, *Notula*; *Mss. hébr.*, 1185/1, *Notula*

historiography Clementini (1617-27); Busi (1995)

literature Serpieri (1878)

catalogues d. Baratta (1901)

catalogues p. Giorgetti and Iaccarino (1971); Carrozzo *et al.* (1973); Postpischl (1985); Postpischl (1991)

The information about this earthquake only reveals the extent to which it was felt in the important cities of the time, such as Rimini, Ravenna, and Cesena. Since there are no sources for the Apennine hinterland or for smaller towns on the Adriatic coast, it has not been possible to establish whether this small amount of information refers to a minor local shock, or whether there was a distant epicentre of which we currently know nothing. The rare value of the manuscript sources which record it (a *Notula* in Italian and another in Hebrew) is such as to suggest that the date of the earthquake deserves further investigation.

The catalogue tradition and that of historical seismology are rather confused and imprecise. Postpischl (1985) lists an earthquake at 6 July 1468, classifies it as having

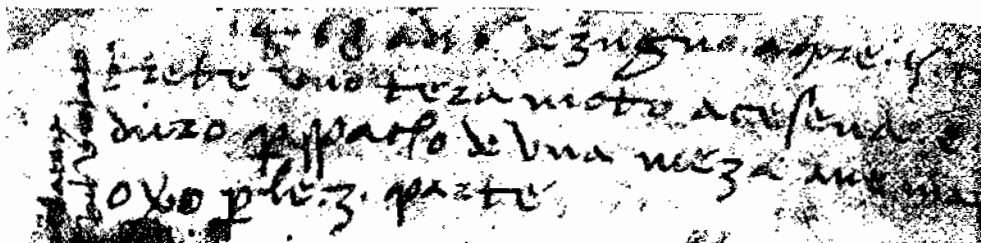


fig. 131 *Notula* in the margin of a 15th c. manuscript codex on the leaves containing the Latin text of Psalms 79 and 80. The *Notula* is in Italian and records that the earthquake of 6 June 1468 was felt at Cesena (Bibliothèque Nationale de France, *ms. latins* 3727, fol.95v; transcription and translation on p.754). On the recto is another *Notula*, written in the same hand, recording earthquakes at Cesena in 1469; see entries < 340-342 >.

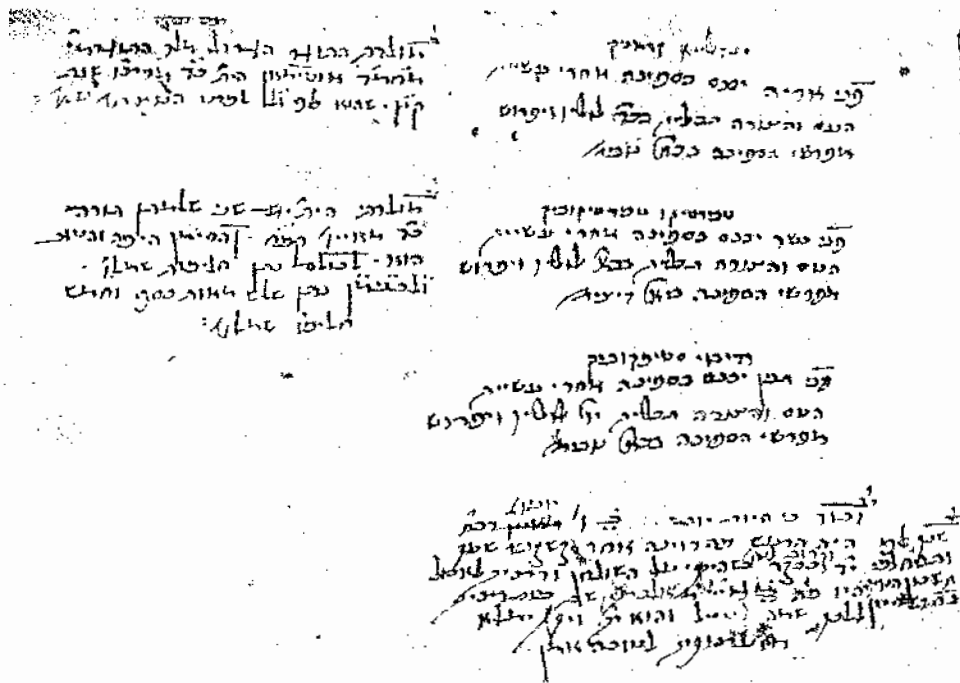


fig. 132 A contemporary *Notula* (indicated by the arrow), recording that the earthquake of 6 June 1468 was felt at Ravenna. As can be seen, the text, in Hebrew, is on a leaf containing five other *Notulae* (Bibliothèque Nationale de France, ms. hébr. 1185/1; transcription and translation on p.755).

an epicentral intensity of grade VII MCS, and locates it at Montescudo (near San Marino). This information comes from Baratta's catalogue (1901, p.78), according to which there was "very serious damage" at Rimini. Baratta had made use of an article by the seismologist Serpieri (1888-89, II, p.166), but misinterpreted it, for Serpieri simply suggested that the earthquake caused "very great fright" — using the same words as those in Clementini (1617-27), a Rimini historian who lived from 1561 to 1624, and whose work was used by Serpieri. In Postpischl (1991) the earthquake is reclassified with an epicentral intensity of grade VI and a maximum intensity of grade V (MCS), and its location is moved to the upper Adriatic.

Our research has brought to light two new sources for Cesena and Ravenna which are unknown to the seismic tradition. These sources make it possible to correct the date of the earthquake from 6 July to 6 June 1468. That this is the same event as the one recorded in seismic catalogues is suggested, in our opinion, by the fact that Clementini (1617-27, II, p.491) gives the same time (the 15th hour) for the two new sources we have found. But we have not found contemporary sources for Rimini. On the basis of the new contemporary sources, the following picture of effects can be delineated.

On 6 June 1468 at 10:30 UT (the fifteenth hour, "Italian time") there was a brief earthquake at Cesena (lasting for about 3 or 4 seconds); it was also felt at Ravenna. The sources do not record any other information about effects. The sources are two contemporary *Notulae* written in the margin of two codices in the Bibliothèque Nationale de France. The *Notula* referring to Cesena (*Manuscripts Latins 3727*, fol.95v.) is written in Italian:

"1468 on 6 June at the 15th hour [...] there was an earthquake at Cesena, and it lasted as long as it takes to recite half or perhaps a third of a Hail Mary".

1468 adì 6 de zugno a hore .15. [...] trete uno teramoto a Cesena et duro per spacero de una meza Ave Maria o vero per le .3. parte.

The *Notula* referring to Ravenna is in Hebrew (*ms. hébr.* 1185/1); it was mentioned in Busi (1995, p.475), but not transcribed. There are some difficulties in interpreting the text, but its general meaning is clear; it to confirm the dating:

"God. Remember that today is the second day [of the week = Monday], 6 of June [five thousand] two hundred and twenty-eight [5228], [in the margin: the year one thousand four hundred and sixty-eight [1468] as the Gentiles count, in the month of Sivan (22 May - 20 June)] there was an earthquake here in Ravenna after the sounding of the fourteenth and close to the fifteenth hour in the morning when I was at the table and wanted to eat, and there were two Gentiles here [...] a crucifix (?) [...] there when I wanted to go there to take a walk and blessed be He and sanctified, will fill [...] us for the best, Amen".

זכור כי היום יום ב' ו' יוניו רכ"ח היה הרעש פה רוונה אחר קשקוש שעת יד וקרוב לטו בבקר כשהייתי על השולחן ורציתי לאכול והיו פה ב' גוי' [ם] ... מצולב ... שם כשרציתי ללכת שמה לטייל והוא ית[ברך] ויה[קדש] ימלא [לטובה אמן]
שנת אלפא ותס"ח לפי השבון הגויי[ם] בתו[דש] סיון

If we also take into account the information provided by Clementini (1617-27, II, p.491), who may have made use of local sources which are now lost, we can also add Rimini to the places struck by this earthquake.

▲ 1468 06 06 10:30 UT Sites: 3

localities	lat.	long.	I	localities	lat.	long.	I
Rimini	44 04	12 34	V	Ravenna	44 25	12 12	F
Cesena	44 08	12 15	F				

(339) 1469 spring Ionian islands [Greece]

source Sphr., *Chron. Minus*, p.186

catalogues d. Schmidt (1881); Galanopoulos (1955; 1961); Galanopoulos (1981); Evangelatou-Notara (1993); *Papazachos and Papazachou (1997)

catalogue p. Shebalin *et al.* (1974)

In the spring of 1469, the Ionian islands were struck by strong earthquakes. The fortified settlement on Cephalonia was completely destroyed, and many inhabitants were killed. Severe damage also occurred on the islands of Santa Maura (present-day Lefkos) and Zacynthus (Zakynthos).

Information about this earthquake is to be found in the *Chronicon Minus* of Sphrantzes:

"In the spring of the same year [1469], numerous strong earthquakes at Santa Maura, Cephalonia and Zacynthus destroyed a large part of these towns. In particular, the fortified settlement of Cephalonia was completely destroyed, and many inhabitants lost their lives".

Καὶ τὸ ἔαρ τοῦ αὐτοῦ ἔτους ἐγένοντο σεισμοὶ πολλοὶ καὶ μεγάλοι εἰς τε τὴν Ἁγίαν Μαῦραν καὶ τὴν Κεφαλλονίαν καὶ τὴν Ζάκυνθον καὶ ἐχάλασαν πολλὰ τῶν αὐτῶν. τὸ δὲ τῆς Κεφαλλονίας κάστρον τελείως ἅπαν ἐχάλασε καὶ πολλοὶ τῶν ἀνθρώπων τεθνήκασιν.

▲ 1469 spring Sites: 3

localities	lat.	long.	I	localities	lat.	long.	I
■ Cephalonia island	38 15	20 35	IX-X	■ Zakynthos island	37 47	20 47	VIII-IX
■ Lefkos island	38 43	20 38	VIII-IX				

- < 340 > 1469 March 27 Cesena [northern Italy]
- < 341 > 1469 March 29 Cesena
- < 342 > 1469 April 2 Cesena

source BNFrance, mss. latins, 3727, fol.95r, Notula

This seismic sequence is unknown to the seismic catalogue tradition. This is another case (see also entry < 338 >) where it is reasonable to postulate a so far unidentified extra-urban epicentre. The chronological indicator may act as a guide for further research. Between 27 March and 2 April 1469, six earthquake shocks were felt at Cesena, but they were weak and brief. The first occurred on 27 March at 16:10 UT (the twenty-second hour, "Italian time") and lasted about 4 seconds; the second occurred on 29 March, at 3:15 UT (the ninth hour, "Italian time"); the other four occurred on 2 April between 22:15 and 23:15 UT (between the 4th and 5th hours, "Italian time") and were weak. In our present state of knowledge, only local effects can be assessed. The source is a contemporary *Notula* written in the margin of folio 95v. of manuscript 3727 in the Bibliothèque Nationale de France (*Manuscripts Latins*). The text of the *Notula* is as follows: "1469 on 27 March at the 22nd hour there was an earthquake at Cesena which lasted as long as half a Hail Mary. On 28 there was another at the 9th hour. There were four more from the 4th to the 5th hour on 2 April, but they were very slight".

1469 adi .27. de março a hore .22. trete uno teramoto a Cesena duro una meza Ave Maria. Item adi 28 ne trete uno altro a hore 9. Item adi 2 de aprille a hore .4. in fino a le ore .5. ne trete .4. ma fure picholini.

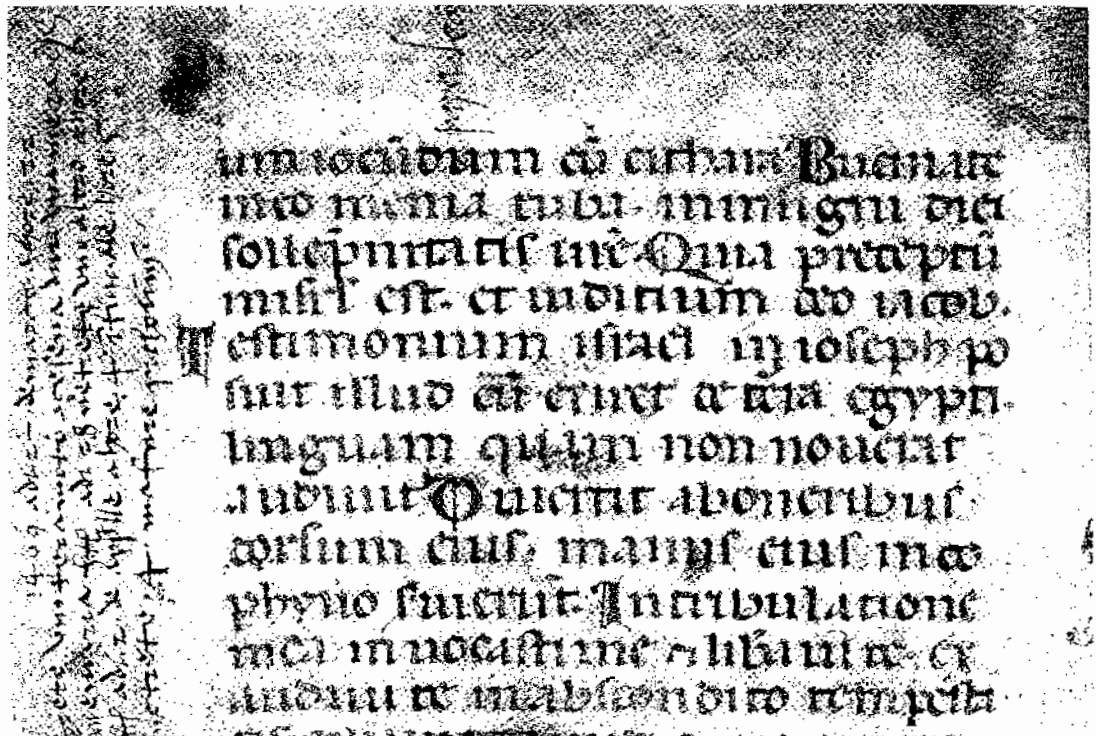


fig. 133 *Notula* written in a 15th c. manuscript codex on the leaves containing the Latin text of Psalms 79 and 80. The *Notula* records that the earthquakes of 27 and 29 March and 2 April were felt at Cesena (Bibliothèque Nationale de France, *ms. latins* 3727, fol.95r; transcription and translation are on this page). On the verso of this leaf is another *Notula* in the same hand, recording the earthquake of 1468 (see entry < 338 >).

▲
1469 03 27 16:10 UT

localities	lat.	long.	I
Cesena	44 08	12 15	F

1469 03 29 03:15 UT

localities	lat.	long.	I
Cesena	44 08	12 15	F

1469 04 02 22:15-23:15 UT

localities	lat.	long.	I
Cesena	44 08	12 15	III

<343> 1470 June - 1472 Lemnos island - northern Aegean [Greece]

source Cippico, *Petri Mocenigi*, fol.7

historiography Koder (1998)

catalogues d. Evangelatou-Notara (1993); *Papazachos and Papazachou (1997)

At some unspecified time between June 1470 and 1472, two fortified settlements were struck by a destructive earthquake on the island of Lemnos, which lies in the northern Aegean between the Chalcidice peninsula and the mouth of the Dardanelles. At Palaeokastron, a large proportion of the walls and towers collapsed, and Kotschinos suffered substantial damage. The surrounding walls of Palaeokastron were subsequently rebuilt by Pietro Mocenigo.

There is information about this earthquake in the work of Coriolano Cippico, a contemporary writer who belonged to a noble family of Dalmatian origin. His work is devoted to Pietro Mocenigo's campaign in the Levant, and was first published in 1477. Cippico records that Pietro Mocenigo, who was then captain general, went to Lemnos in 1472, and he also reports:

"The island of Lemnos has two fortified settlements, Palaeokastron and Kotschinos. Kotschinos was violently shaken by the earthquake and collapsed in ruins. A large part of the walls and towers of Palaeokastron also collapsed; the captain general [Pietro Mocenigo] took care to have them restored and rebuilt, and it was in this fortified settlement that he garrisoned the troops he had brought from the Peloponnese".

Lemnos insula duo oppida habet: Paleocastrum et Cocinum appellant. Cocinum terremotu quassum funditus corruerat. Maxima etiam pars murorum ac turrium Paleocastri, que imperator summo studio reficere ac restituere curavit presidiumque militum quos ex Peloponneso adduxerat oppido imposuit.

The chronology of the earthquake can only be established approximately. The year 1472, when Mocenigo went to Lemnos, is a *terminus ante quem*. This is the chronological evidence used by Evangelatou-Notara (1993, pp.107-8). Papazachos and Papazachou (1997, p.197), on the other hand, date the earthquake to 1471. We can establish a *terminus post quem*, however, thanks to a passage in Sphrantzes (46.5, ed. Maisano 1990, p.188) about a Turkish raid in June/July 1470. On that occasion, the Turks went to Lemnos and occupied Kotschinos and all the other villages on the island except for Palaeokastron and Skala. Clearly the earthquake damaged the walls of Palaeokastron and Kotschinos after that date.

There is evidence of the reconstruction of the village walls at Palaeokastron, undertaken by Pietro Mocenigo, in the presence on the walls of the coat of arms of doges Cristoforo Moro (1462-71) and Nocolò Tron (1471-73) (Koder 1998, p.247 and note 25).

▲ 1470 June - 1472

localities	lat.	long.	I	localities	lat.	long.	I
Palaeokastron	40 00	25 25	VIII-IX	Kotschinos	39 55	25 15	VII-VIII

< 344 > **1473 May 7 Po Plain [northern Italy]**

- sources 1 [manuscripts] ASMi, *Sforzesco*, Registri sforzeschi, Registri delle missive, 111, fol.230, Galeazzo Maria Sforza (duke), Letter, 12 May 1473; *Sforzesco*, Carteggio sforzesco, Potenze estere, Romagna, cart.179, Cerruti Gerardo, Letter, June 1473; Da Ripalta Alberto, *Ann.*, col.942; Simonetta, *I Diari*, I, p.27; *Notula* in a church obituary from Monza, in Frisi (1794, III, p.119)
- sources 2 BAmbrosiana, Milan, *Trotti* 230, *Hist.*; ASFlorence, *Mss.*, 119, B.Dei, *Cron.*; Bossi (1492); Corio (1503)
- historiography Robolini (1838); Giulini (1854-57); Capsoni (1876); Gargantini (1874); Gazzini *et al.* (1991)
- catalogues d. Bonito (1691); Perrey (1848); Mallet (1853); Mercalli (1883); Agnelli (1895); Baratta (1901); *Boschi *et al.* (1995, 1997, 2000)
- catalogues p. Giorgetti and Iaccarino (1971); Carrozzo *et al.* (1973); Postpischl (1985)

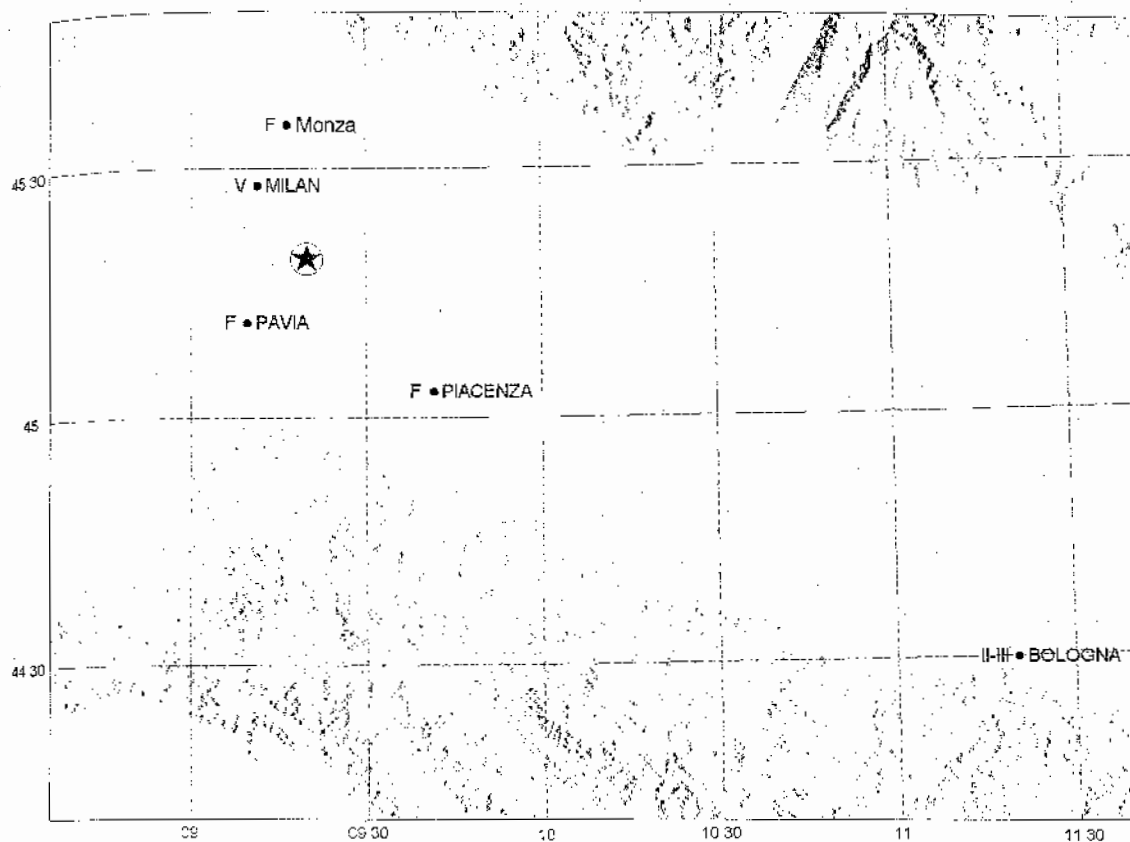
This earthquake was given an epicentral intensity of grade IX MCS in Postpischl's parametric catalogue (1985). The analysis presented here is based on Boschi *et al.* (1995, 1997, 2000) and permits a substantial reassessment of the previous intensity estimate. There is no record of damage caused by this earthquake in contemporary sources. About thirty years after the shock, two historians, Bossi (1492) and Corio (1503), mentioned damage to buildings in Milan, and this information was taken up in other works in the last two decades of the 16th century. In the second half of the 17th century, stress was given to this information about collapsing buildings, and the quite new suggestion was made that there had been a large number of victims. Many later writers made use of these works without going back to primary sources. This incorrect historiographical tradition made its way into the catalogues of Mercalli (1883), Baratta (1901) and Postpischl (1985), who took this to have been a destructive earthquake.

The earthquake occurred on 7 May 1473 at 7:45 UT (the thirteenth hour in "Italian time"). It was very strongly felt in Milan, where it struck terror into the inhabitants. It was felt less strongly at Monza, Pavia and Piacenza; while at Bologna it was felt very slightly and only by a few people.

The principal source for this shock is a letter sent by Galeazzo Maria Sforza, duke of Milan, a few days after the shock, to his ambassadors in Bologna, Florence, Rome and Naples in order to find out what effect the earthquake might have had in those cities. The letter is quoted in Gazzini *et al.* (1991):

"On the seventh day of this present month [May 1473] at about the thirteenth hour an earthquake occurred here in various parts of our dominion, but it lasted for only a short time and caused no damage to buildings. We wish to know whether it occurred anywhere else, and so we wish you to write to us and inform us whether the said earthquake was felt where you are and in the surrounding area, how long it lasted, and whether it damaged houses, supplying details of anything that may have happened as a result. [Milan 12 May 1473, Galeazzo Maria Sforza]".

A dì septe del presente mese circa le tredece hore fo qui nel dominio nostro in diversi lochi uno terremoto el qual durò pocho et non fece nocumento alchuno a li edifici. Desideramo intendere si lo è intervenuto altrove, però volimo tu ne scrive et daghe aviso si dicto terremoto è stato sentito lì et ne le terre circumstante et quanto el durò et si lo ha nociuto a le case et particolarmente de tutto quello che è possuto intervenire per tale casone. [Milano 12 maggio 1473, Galeazzo Maria Sforza]



1473
May 7

0 30 km

fig. 134

The only certain reply is a letter sent a month later by Geraldo Cerruti, who was ambassador at Bologna:

"as regards what Your Highness [Galeazzo Maria Sforza] tells me of the earthquakes, I can reply that more than a month ago some said there had been some movement at daybreak, but it was so brief and slight that few noticed it and they disregarded it as something of which there was no certainty. If it was talked about at all it was because some astrologers had mentioned it in their predictions, and it was thought that this was the earthquake concerned. There was only one shock, and it was not reported to have occurred anywhere else, and nothing more has been heard since [...]. [Bologna June 1473, Gerardo Cerruti]"

visto quanto vostra Celsitudine mi dice de li terremoti, rispondo che l'è più d'un mese che per alcuni se disse esserci stato alcun movimento sul fare del dì, ma fu sì breve et sì leve ch'el parse essere in noticia de pochi et come di cosa quasi non ben certa non se ne fece caso. Donde più se ne ragionasse fu per essere stato alcuni astrologi che ne suoi iudicii ne havevano facto mentione et sun quello si fece concepto che terremoto fusse. Scossò una volta in tutto et non se intese ch'el fusse altrove cha qui, né da poi mai se n'è sentito altro [...]. [Bologna giugno 1473, Gerardo Cerruti]

The ambassadors in Naples and Rome replied that no shock had been felt there, but no reply from the ambassador in Florence has been found.

Another important source is the diaries of Cicco Simonetta, head of the duke of Milan's chancery, who experienced the event himself:

"Milan, Friday 7 May, 1473. At approximately the thirteenth hour, an earthquake occurred here in Milan, such that the whole earth seemed to move, and yet it did no other harm than severely frighten the people, but it only lasted a short while".

Mediolani, die veneris VII maii, 1473. In quest'hora, XIII, vel circa, venne uno terremotto qui, in Milano, per il quale apparse muoversi tucta la terra et nondimancho non fece altro male, excepto che misse grande terrore alla brigata, ma non durò uno voltare de mano.

There is a contemporary report of the shock at Pavia and Piacenza, where it was scarcely noticed, in the *Annales Placentini* of Alberto da Ripalta, who continued his father Antonio's chronicle to cover the years 1465-84:

"In the year of Our Lord 1473, on 7 May at the thirteenth hour, there was an earthquake in the cities of Milan, Pavia and Piacenza, and it rained for almost the entire month".

Anno Domini 1473 die septima Maii hora decima et tertia terraemotus fuit in civitate Mediolani, et Papias, ac Placentias aliquid, et quasi per totum mensem pluit.

According to an "obit diary" in the church of Monza, quoted in Frisi (1794, III, p.119), the shock was also felt in Monza:

"1473 on Friday 7 May there was an earthquake at the thirteenth hour".

M. CCCC. LXXIIJ. die veneris septimo maij terremotus factus fuit eo die hora tertiadecima.

▲ 1473 05 07 7:45 UT ☼ = 45 19 09 20 I ₀ = IV-V Me = 4.4 Sites: 5								
localities	lat.	long.	I	localities	lat.	long.	I	
Milan	45 28	09 11	V	Piacenza	45 03	09 42	F	
Monza	45 35	09 16	F	Bologna	44 30	11 20	II-III	
Pavia	45 11	09 10	F					

< 345 > **1476 October 20 - November 18 [Rajab 881 H.] Cairo [Egypt]**

sources Ibn Iyas, *Bada'i*, III, p.121; al-Suyuti, *Kashf*, p.58

historiography Lane (1867)

literature Taher (1979)

catalogue d. *Ambraseys *et al.* (1994)

catalogue p. Poirier and Taher (1980)

During an unspecified night between 20 October and 18 November 1476, Cairo was struck by an earthquake which is described as "terrible" in two contemporary sources. According to Ibn Iyas there would have been serious damage if the shock had lasted longer; however, al-Suyuti describes the earthquake as slight. Ibn Iyas writes: "in the month of *Rajab* [20 October - 18 November 1476], there was an earthquake at new Cairo during the night. It was terrible and struck various buildings. If it had lasted for another *daraja*, the people would have suffered great harm".

و في رجب وقع بالقاهرة زلزلة في الليل، و كانت مهولة، وقع منها بعض أماكن، و لو أنها دامت درجة أخرى حصل منها غاية الضرر للناس.

Al-Suyuti writes: "Old Cairo (*Misr*) was struck by a minor earthquake during the night. [881 H. = 26 April 1476 - 14 April 1477]".

زلزلت محسر زلزلة لطيفة ليلا.

Although al-Suyuti estimates the intensity of the earthquake differently from Ibn Iyas, the fact that he refers to the night suggests that he is referring to the same event. The term *daraja* (literally 'degree'), normally indicates a period of four minutes. (24 hours correspond to 360°, so one degree corresponds to 4 minutes: Lane 1867, *ad vocem*). In certain contexts, however, it may simply convey a brief period of time, or one minute (see Ambraseys *et al.* 1994, p.xvii). In the context of this earthquake, Ambraseys *et al.*

(1994, p.50) interpret Ibn Iyas' use of the term as indicating one minute. They also refer to another, unpublished, source, which describes the collapse of some old and abandoned buildings. Ambraseys *et al.* (1994, p.102) give it an epicentral intensity of class F, which is equivalent in their classification to a range from felt to strong (up to grade VI MSK).

▲ 1476 10 20 – 11 18 [*Rajab* 881 H.]
 localities lat. long. I
 Cairo 30 03 31 15 V

< 346 > 1477 January c. 1 Foligno – Umbria [central Italy]

< 347 > 1477 January 30 Foligno

< 348 > 1477 February 3 Foligno

sources [manuscripts] ASPg, Sez. Foligno, *Priorale*, Consigli e riformanze, reg.38, fol.56, Michelangelo Grillo, *De terremotibus Fulginei*; fol.59, Minutes of a meeting of the council of the commune of Foligno held on 19 March 1477
 ASPg, *Notarile*, Protocolli, 209, Francesco di Giacomo, *Notula*
 historiography Abbondanza (1973)
 literature Castelli and Monachesi (1996); Boschi *et al.* (1998)
 catalogues d. Conversini *et al.* (1990); *Boschi *et al.* (2000)
 catalogue p. CPTI (1999)

From early January 1477 until May of the same year, a seismic sequence particularly affected Foligno, a small Umbrian town in the province of Perugia. The first shocks were slight, but they increased in intensity towards the end of January. At 16:00 UT (the twenty-third hour, "Italian time") on 30 January, a very powerful shock struck fear into the townspeople of Foligno, who abandoned their homes, in spite of the cold, and set up makeshift shelters in the open. During the night of 2-3 February, at 1:00 UT (the eighth hour of the night, "Italian time"), the strongest shock of the whole sequence was felt. Every building in Foligno was damaged, and some of the oldest collapsed. Three merlons fell off the *palazzo priorale*, damaging some of the roof and tiles in their fall. Of the other buildings in the same complex, there was damage to the chapel and chancery. This latter part of the *palazzo priorale* had been damaged on a previous occasion and therefore reinforced with four iron braces, but now it was damaged so severely that it threatened to collapse. The shock lasted for about 8 seconds, and was strongly felt at Perugia, and less so at Todi (in the province of Perugia).

On 19 March 1477, the council of the commune of Foligno approved a decision to repair the *palazzo priorale*, the most seriously damaged part of which was in danger of collapse, and to entrust to two citizens the task of supervising reconstruction work.

Until a few years ago, this earthquake was unknown, and indeed it does not appear in the PFG Catalogue (Postpischl 1985). It is mentioned for the first time in a study by Conversini *et al.* (1990), was taken up again by Castelli and Monachesi (1996), and then revised using additional sources in Boschi *et al.* (1998, pp.42-4).

The principal source — already used by Conversini *et al.* (1990) — consists of a contemporary memoir written by Michelangelo Grillo, notary to the commune of Foligno, and inserted by him amongst the *Riformanze* of the Foligno town council. The document is preserved in the Foligno section of the Archivio di Stato at Perugia (*Priorale, Consigli e riformanze*, reg.38, fol.56).

oldest buildings there were collapses, and you could see that very few chimneys were left intact. Three merlons fell from their position at the top of the front wall of the *palazzo priorale*, causing damage to the roof and its tiles. The *palazzo "plurifarianum"* was badly damaged. That part of it which was occupied by the chancery, and which had been damaged shortly before and reinforced with four iron braces, suffered dreadful damage. People thought that the braces would hold, instead of which there was a total collapse, which also damaged the surrounding area. That night, and the following morning, the earth was shaken so frequently, though not very violently, that it could be seen never to remain still at all. What confusion there was in the town, and what an outcry filled the air, because of the great danger! We spent the night in the squares and gardens, in houses and by the town walls, exposed only to the rigours of the wind and snow; you would have expected the places and *castelli* where we gathered in the open and in tents to remain full until half way through the month, but the shaking of the earth went on after the end of February, lasting until May. [...] The earthquake was felt at Todi and places around it, but not so much as to be frightening".

De terremotibus Fulginei. Cum pro virili mea non solum que ad publicum scribam sed quequam memoratu digna annalibus quos ipse conscripsi mandaverim, illud nequaquam silentio preter eundem censui cladem terremotum ut pro se horribilem ita hic prius insolitam; circiter kalendis ianuarii terra paululum movit, sequentibus diebus et quo propius finem mensibus crebuis fortiusque moveri. Die triginta hora communiter XXIII ita mutaverunt omnia, ut timere incipientes formidare cogirentur velut quam metientes errare, parare casas humiles et loca tutiora, verum sevientem hyeme, vento, nive et sperantes futura meliora quod nunquam durius in hanc regionem huiusmodi pestis, senisque rarissimi egressi sunt urbe. Secunda nocte februarii cum interim tam sepius tremuisse ita quod ut parochiali solemniter Candelora ecclesias frequentaverint et illi ita suspecti ut magis fuge quam divinis rebus intenti viderentur, tantus tremor hora ferme VIII invaluit ut ferme nullum edificium illesum remanserit, vetustiora alique ruerint inter quem camini urbis rarissimi integri conspicerentur. Meruli quos vocant ex fastigio anterioris parietis palatii priorum tres decedentes tecti tabulatique partem traxerunt. Palatium plurifarianum scissum est. Pars illius ubi sacellum cancellarie quod vis mutatur: iam pridem paulum scissa et arme clavibus quattuor ferreis munita, id metuens tam instaurari, horribilius aperte est. Creditur quod vulgo in ille claves continuissent: ruisse omnino et ruina sua circumstantia loca suppressisse. Nocte illa et die quod illuxit tam frequente nec tamen contemtandum in modum movit terra ut firme numquam quiescere visa est. Quantus strepitus per urbem, clamorque per auras fieret summo periculo metiendum est. Discurritur nocte media in plateas, ortos, casas, pomeriaque urbis celo tantum sevitante vento niveque; credidisses in que confluximus loca, castra adeo teritoriis tabernaculisque ad medium mensis plena erant. Durarunt autem tremores terre usque ad maii elepso februario. [...] terremotus Tuderti locisque tamquam vicinis circumscitis auditus non formidatus est.

In the minutes of the meeting of Foligno town council held on 19 March 1477, we read: "The *priore* himself made an additional proposal, informing those present that the part of the *palazzo* containing the chapel and with the chancery of the commune underneath, had been terribly split open by the earthquakes which had occurred in the preceding months, and therefore the council should make arrangements to repair it before it collapsed. Mariangelo di Giacomo then spoke, in accordance with the rules, advising and proposing that the illustrious *signori priori* should elect two citizens who should have full authority and powers to have repairs and restoration work carried out as and how they think best, in order to deal most appropriately with the said place and the part of the said *palazzo*, with all appropriate and necessary expenses. This motion seeming right and just, it was put to the vote and approved by 38 balls for and 18 against. So these things were formally decided and agreed".

Suprastantis idem prior addens preposuit et dixit: eam partem palatii inque capelle et sub ea cancelleria communis sita foret a terremotibus qui superioribus mensibus grassati forent horrendum in modum fuisse scissam, igitur priusquam ruat consilium providere eam reparare. Mariangelus Iacobi servatis servandis dixit, consuluit et arengavit quod magnifici domini priores cives duos eligaret qui habeant plerissimum arbitrium et bailiam aptari, reformarique in tam formam et modum, qui sibi melius sibi visi finire melior faciendi dictum locum et partem dicti palatii cum expensis opportunis et necessariis. Ea sententia equa et iusta visa ad partem quod missa ac obtenta per palluctas XXXVIII non obstantibus, XVIII contrariis. Ita denum statuta fuit et reformata solemniter.

In the memoir by the notary Francesco di Giacomo of Perugia, which tells of earthquake effects at Perugia and Foligno, we read:

"Let it thus be noted that on the second day of February, half way through the seventh hour of the night, there was a great earthquake in the town of Perugia, lasting as long as one Hail Mary. The wind blew that night, and snow fell that same night, and there were more earthquakes which damaged the town of Foligno [...]"

Notum sit qualiter die secundo february, hora septima cum dimidia noctis, fuit in civitate Perusii terremotus magnus, et duravit per spatium unius avemarie, qua nocte venti flabarunt et nix cecidit eadem nocte, et plures terremotus furent et dampnificaverunt civitatem Fulginei [...].



1477 01 01 c.

localities	lat.	long.	I
Foligno	42 57	12 42	F

1477 01 30 16:00 UT

localities	lat.	long.	I
Foligno	42 57	12 42	V-VI

1477 02 3 1:00 UT Sites: 3

localities	lat.	long.	I	localities	lat.	long.	I
Foligno	42 57	12 42	VII-VIII	Todi	42 47	12 24	F
Perugia	43 06	12 23	V				

< 349 > 1477 October 12 Cyprus?

source *Notula*, in Spyridon and Eustratiadis (1925, p.2)

catalogue d. Evangelatou-Notara (1993)

On 12 October 1477, there was an earthquake, possibly in the island of Cyprus, but its effects are not specified. There is information about the earthquake in a *Notula* in manuscript Athon. Laura A 9 (9) (published in Spyridon and Eustratiadis 1925, p.2): "6900 [1 September 1477 – 31 August 1478], on 12 October in the eighty-sixth year of Christ there was an earthquake".

Ὁ εἰς τὰς δώδεκα τοῦ ὀκτωβρίου μηνὸς τῆς ὀγδοηκοστῆς ἑκτῆς τοῦ Χριστοῦ ἐγγρονίας ἐγένετο σεισμός.

The presence of the typically Cypriot word (ἐγγρονίας) suggests to Evangelatou-Notara (1993, p.108) that the earthquake struck that island.

△ There are no elements with which to indicate the parameters.

< 350 > 1479 October 16 Nicosia [Cyprus]

source Notula, in Darrouzès (1953, p.89)

catalogue d. Evangelatou-Notara (1993)

On 16 October 1479 at 8:00 UT (half way through the fourth hour of the day), there was an earthquake at Nicosia (or Lefkosia), on the island of Cyprus. The source describes it as "great", but no effects are specified. Noises similar to the lowing of cattle were heard.

There is information about the earthquake in a *Notula* in manuscript *graecus* 1589, fol.75v. in the Bibliothèque Nationale de France (published in Darrouzès 1953, p.89):

"On that same day [16 October], a Saturday, half way through the fourth hour of the day there was a great earthquake throughout Lefkosia, and the earth lowed, on 16 of the same month, 1479 since the birth of Christ".

τὴν αὐτὴν ἡμέραν, σαβάντο, ορες τις υμερα τέσερες κε ἡμισι ἐγίνετον σισμός μέγας ἥς ὅλην τὴν Λευκοσίαν καὶ ἐμουγκαρήστηκε ἡ γι στάς δεκάξι τοῦ αὐτοῦ μινός, αουθ' Χ(ριστο)ῦ

▲ 1479 10 16 8:00 UT

localities	lat.	long.	I
Nicosia	35 10	33 22	V-VI

< 351 > 1480 southern Marche [central Italy]

sources BCAPiceno, *Cronache ascolane*, A.I.16, *Libro delle mem. antiche*, fol.26r.

catalogues d. Baratta (1899, 1901); *Boschi *et al.* (1997, 2000)

catalogues p. Giorgètti and Iaccarino (1971); Carrozzo *et al.* (1973); Postpischl (1985); CPTI (1999)

On an unspecified day and month in 1480, a strong earthquake caused substantial damage in the territory of three small villages situated in the lower valley of the river Tronto, in the present-day province of Ascoli Piceno. They were Montepandone, where a stretch of wall on the eastern side collapsed, Spinetoli and Monsampolo del Tronto. At Ascoli Piceno itself the earthquake was very strong, but there is no record of damage, and there were no victims. There was a succession of shocks lasting about an hour.

This earthquake is recorded in the *Libro delle memorie antiche della città d'Ascoli dal 1345 al 1565*, an anonymous work which probably dates to the late 16th-early 17th century, and of which there are various copies. There is a 17th century transcription by the copyist Giuseppe Riccardi in the Biblioteca Comunale "Gabrielli" at Ascoli Piceno (*Cronache ascolane*, A.I.16):

"1480. There was a great and cruel earthquake which lasted for the space of an hour and caused much damage in the territory of Spinetoli, Monsampolo [del Tronto] and Montepandone, where it caused part of the walls on the seaward side to collapse, without the villagers being injured".

1480. Fu un terremoto tanto grande e crudele, durando per lo spazio d'un'ora, fece moltissimo danno nel territorio di Spinetoli, Monte S.Poli e Monte Prandone dove fece cadere una parte di muraglia della marina, senza danno dei terrazzani.

Information about this earthquake entered the seismological tradition through the materials collected by De Rossi and published by Baratta (1899). De Rossi had drawn his information from a manuscript *Cronaca Ascolana dal 1345 al 1565* in the Biblioteca Comunale at Ascoli Piceno.

We also examined another contemporary chronicle from the Ascoli area both in the version found in the codex *Ottoboniano Latino* 1980, which was recently published by



1480

0 15 km

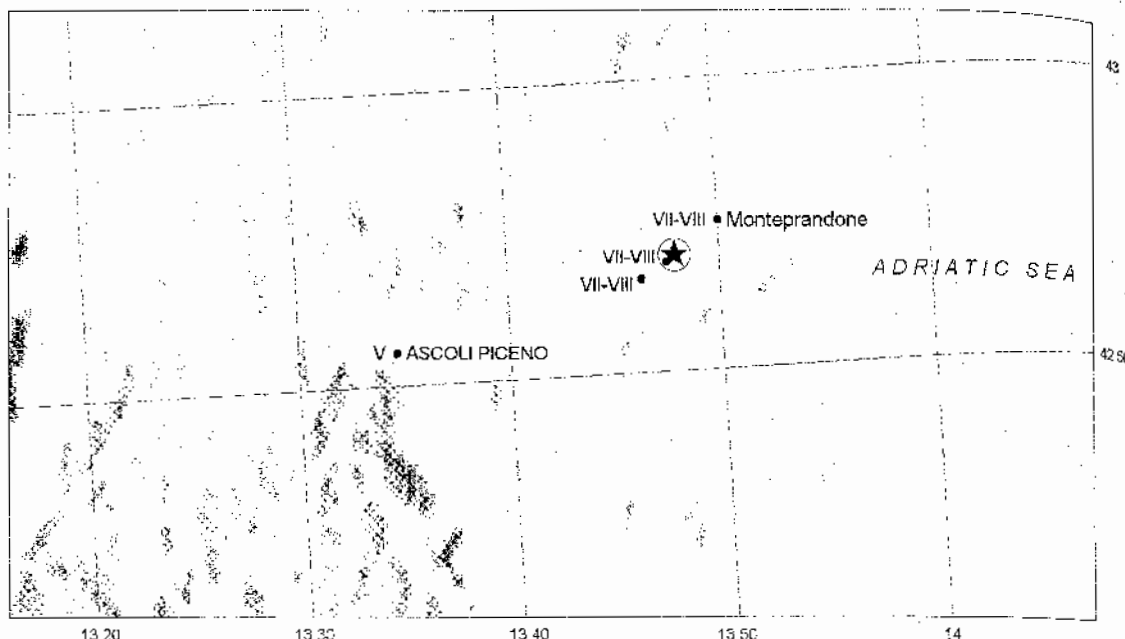


fig. 136

Salvi (1993), and in the manuscript version in codex *Vaticano Latino 7934* (Biblioteca Apostolica Vaticana, 18th c. copy by P.L.Galletti); but nothing relevant was found in either case.

▲ 1480 ★ = 42 54 13 48 I₀ = VII-VIII M_e = 5.5 Sites: 4

localities	lat.	long.	I	localities	lat.	long.	I
Monsampolo d.Tronto	42 54	13 48	VII-VIII	Spinetoli	42 53	13 46	VII-VIII
Montepandone	42 55	13 50	VII-VIII	Ascoli Piceno	42 51	13 35	V

< 352 > 1481 February 6 northern Tuscany [Italy]

< 353 > 1481 February 7 Lucca

< 354 > 1481 February 7 central Emilia

sources [manuscript] ASFlorence, *Otto di Pratica*, Carteggi, Responsive, filza 1, fol.213, Bartolomeo Pucci, Letter, 10 May 1481

Cron. gestor., p.94; Palmieri Mattia, *Opus*, cols.269-70; Landucci, *Diario*, p.37; Bianchi, *Cron.*, I, p.48

historiography Vedriani (1666-67); Pezzana (1837-59); Sforza (1913)

catalogues a. Perrey (1848); Mallet (1853); Mercalli (1883); Benassi (1899); Baratta (1901); Guidi (1915); *Boschi *et al.* (1995, 1997, 2000)

catalogues p. Giorgetti and Iaccarino (1971); Carrozzo *et al.* (1973); Postpischl (1985)

On 6 and 7 February 1481, an earthquake sequence struck northern Tuscany and central Emilia. A large number of earthquakes were felt at Fivizzano from 6 February onwards (no effects are specified) leading up to the destructive earthquake of 7 May in the same year (see the entry concerned). At 21:15 UT (the fourth hour, "Italian time") on the same 6 February, there was an earthquake at Lucca described as "very great" (*grandissimo*) (its effects are not specified), followed by two more shocks described as

small (*piccoli*), followed at dawn the next day by the strongest shock of all (but in this case, too, no particular effects are specified). At Pisa, the earthquakes of February 1481 — described as “unusual” (*insoliti*) — terrified the city’s inhabitants. At Florence, the earthquake which occurred at 21:45 UT (halfway through the fourth hour, “Italian time”) on that same 6 February was fairly weak (*non... molto grande*).

To complete the corpus of information about the earthquake shocks in February 1481, we should also mention evidence of their being felt in the Emilia region: there is evidence of three shocks at Parma, but they did not cause damage (the event is described as “great” — *magnus*, but it is specifically denied that there was damage); at Modena, the bells of the cathedral tower and those of the town-hall rang of their own accord.

In these last two cities the earthquakes took place on the night of 7-8 February 1481, between 22:15 and 23:15 UT (the fifth and sixth hours, “Italian time”) on 7 February. If we accept the chronology of the event in Emilia exactly as it is offered, it would seem to be distinct from the shocks felt in Tuscany during the night of 6 February and at dawn on 7 February. However, the difference of a single day (as also between Bartolomeo Pucci’s and Ruberto dal Portico’s accounts of the earthquake of 7 May, see below), may not be significant. The shocks felt in Emilia may have come from the shocks in Tuscany.

Our knowledge of these earthquakes of 6-7 February derives from six contemporary sources; four concern Tuscany and two Emilia. The first of these is a letter sent by *capitano* Bartolomeo Pucci on 10 May to the *Otto di Pratica*, a committee set up by the Florentine republic in 1480, their duties including responsibility for fortresses:

“Illustrious Gentlemen, I write simply to inform your worships of the situation in which we find ourselves: in addition to many earthquakes on 6 February, a terrible earthquake occurred at the 19th hour on Monday 7 [May]. [...] Fivizzano 10 May 1481. Your humble servant B. Pucci *Cap[itano]*”.

Magnifici Domini mei illustrissimi, Solo per dare notizia alle Vostre S. in che termini stiamo, oltre a molti tremuoti venuti da dì 6 di febbraio, lunedì a dì 7. [maggio] a ore 19. venne un tremuoto terribile [...]. Fivizani die X maij 1481. Servo B. Pucci Capitano.

The letter continues with a description of the effects of the earthquake of 7 May in Lunigiana (see below). The second source is recorded in Guidi’s catalogue (1915, p.25), which draws on the *Diario* of Ruberto dal Portico, a contemporary author from Lucca: “1481. On 6 February, at the 4th hour of the night, there was a very great earthquake, and then there were 2 small ones, and then at about daybreak there was another, greater than all the rest”.

1481. A dì 6 Febbraio, a hore 4 di notte, fue grandissimo tremuoto, dopoi ne furno 2 piccoli, dopoi circa la campana del dì ne fue un altro maggiore di tutti.

The third source is the *Opus de temporibus suis* (1448-1482) by the Pisan writer Mattia Palmieri, which appears in the first volume of the continuation of the *Rerum Italicarum Scriptores* (ed. Tartini). Care has to be taken to distinguish this author, who died in Rome in 1483, from the very similarly named Matteo Palmieri, who died in Florence in 1474. Mattia Palmerius writes:

“In the month of February [1481] unusual earthquakes frightened the people of Pisa and Lucca”.

Februario mense terraemotus insoliti Pisanos, Lucensesque terruerunt.

Mattia Palmerius does not record the day on which the earthquakes occurred. But since Pisa and Lucca are not far apart, and since we know from the *Diario* of Ruberto dal Portico that Lucca had itself been struck by the earthquakes which occurred during the night of 6-7 February, it seems reasonable to conclude that Pisa was also affected by those same events. The fourth source is the *Diario fiorentino* of Luca



1481
February
6 and 7

0 30 km

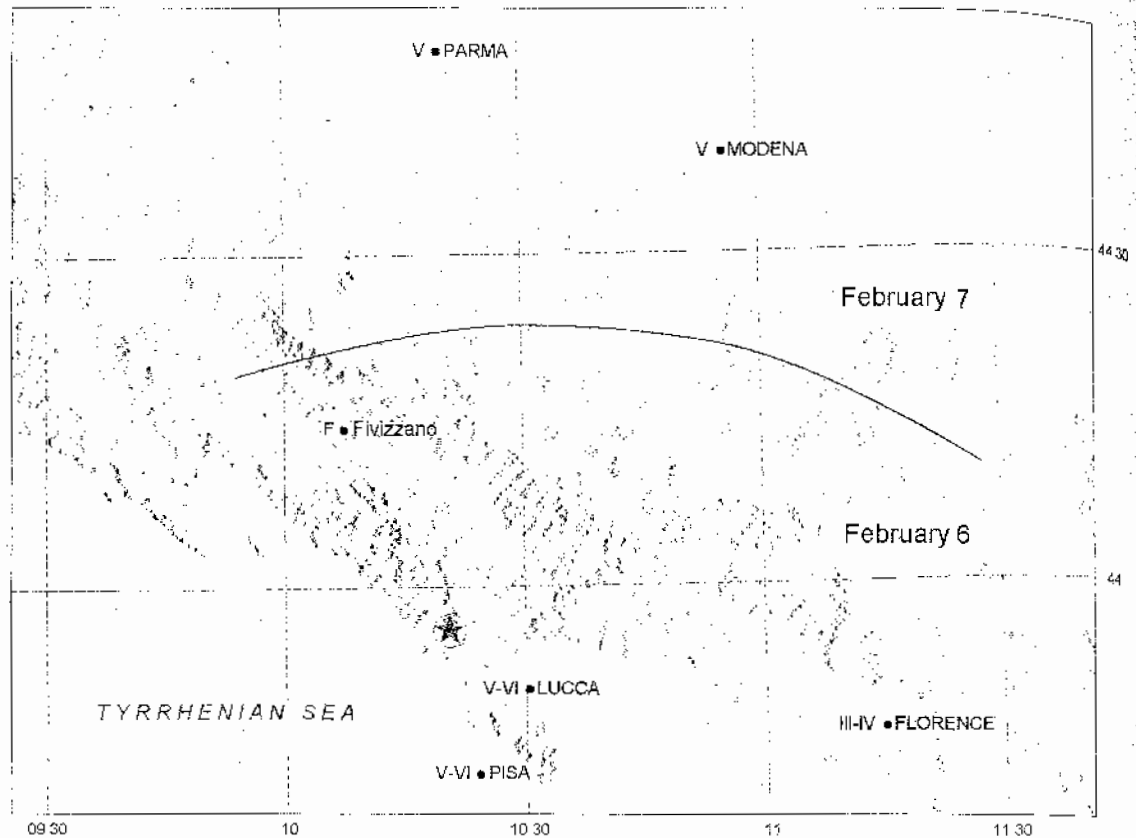


fig. 137

Landucci, a contemporary spice merchant and first-hand witness of events in Florence: "And on 6 February 1480 [Florentine Incarnation style; 1481 modern style], there was an earthquake about half way through the 4th hour, but it was not very strong".

E a di 6 febbraio 1480, venne un tremuoto circa a ore 4 2/4, avengaché non fussi molto grande.

The last two sources deal with effects in Emilia. The fifth source is the *Cronica Gestorum in partibus Lombardie et reliquis Italiae*, a late 15th century anonymous local chronicle from Parma:

"On the night of 7 February in the year 1481 there was a great earthquake in the city of Parma, and at the fifth hour of the following night there were three shocks, but without any damage being caused.

In nocte septimi februarij anni 1481 fuit magnus terremotus in civitate Parme hora quinta noctis sequentis, qui tribus vicibus ea nocte venit, sine tamen aliqua lexione.

The sixth source is the *Cronaca Modenese* by Jacopino de' Bianchi, a spice merchant from Modena, known as de' Lancellotti, who was a contemporary and a first-hand witness of events:

"on 7 February, as 8 February [1481] was approaching, at the 6th hour There was an earthquake at Modena such that the bells of the cathedral tower and those of the palazzo rang of their own accord".

adi 7 vignendo adi 8 de febraro da hore 6 Treto uno teramoto in Modena per modo che da sua posta sono le champane de la tore del domo e quele de palazzo.

▲ 1481 02 06 21:15 UT ☉ = 43 56 10 21 I₀ = V-VI Me = 4.7 Sites: 4

localities	lat.	long.	I	localities	lat.	long.	I
Lucca	43 51	10 30	V-VI	Fivizzano	44 14	10 07	F
Pisa	43 43	10 24	V-VI	Florence	43 47	11 15	III-IV

1481 02 07 at dawn

localities	lat.	long.	I
Lucca	43 51	10 30	V-VI

1481 02 07 22:15 - 23:15 UT

localities	lat.	long.	I	localities	lat.	long.	I
Modena	44 39	10 56	V	Parma	44 48	10 20	V

< 355 > 1481 February 14 Ragusa [southern Croatia]

sources 2 Razzi (1595, p.64)
 literature Albini (2004)
 catalogue d. von Hoff (1840); Perrey (1850)
 catalogue p. Shebalin *et al.* (1974)

On 14 February 1481, at about 22:00 UT (the fifth hour of the night, "Italian time"), a strong earthquake struck the town of Ragusa (now Dubrovnik, in Croatia), causing serious damage and house collapses. Information about this earthquake is recorded in a history of the town of Ragusa by the Dominican theologian Serafino Razzi (1531-1611): "In that same year 1481, on 14 February, around the fifth hour of the night, there was a very great earthquake at Ragusa, which did great damage and reduced houses to ruins".

Dell'istesso Anno 1481 alli 14 di Febraio, intorno alle cinque hore di notte, venne in Raugia un terremuoto grandissimo, il quale fece gran danno, e rovina di case.

▲ 1481 02 14 22:00 UT

localities	lat.	long.	I
Dubrovnik	42 40	18 07	VII-VIII

< 356 > 1481 March 18 Cyprus

sources 1 Guillaume Caoursin, *De terremotus*; Suriano, *Il Trattato*, p.219; *Crón. gestorum*, p.105; Sanudo, *Le Vite*, I, p.338; *Notula* in Naoumidou (1972-73, p.380) and in Constantinides and Browning (1993, p.221); al-Sakhawi, *al-Dhaw'*, X, p.180; al-Suyuti, *Kashf*, p.58; Ibn Iyas, *Bada'i'*, III, pp.178-9; Ibn Tulun, *Mufakahat*, I, p.34
 sources 2 Bosio (1594)
 historiography Coronelli and Parisotti (1688); Figliuolo (2002)
 catalogues d. Bonito (1691); Schmidt (1881); Sieberg (1932a); *Ambraseys (1965); Ben-Menahem (1979); Galanopoulos (1981); Evangelatou-Notara (1993); Amiran *et al.* (1994); *Ambrascys *et al.* (1994); *Papazachos and Papazachou (1997)
 catalogues p. Shebalin *et al.* (1974); Poirier and Taher (1980); Bektur and Alpay (1988)

In the year 1481, the island of Rhodes was struck by a long sequence of strong earthquakes, which also caused damage in Cyprus and Egypt.

From the time of the work of Bonito (1691) up to the recent studies by Evangelatou-Notara (1993, pp.109-10), Papazachos and Papazachou (1997, p.197), and Figliuolo

(2002, p.895), the seismic catalogue tradition has consistently dated the first shock in the sequence to 15 March 1481. Evangelatou-Notara (1993, pp.109-10) lists two separate earthquakes in March 1481, the first on 15 in Rhodes, and the second on 18 in Cyprus. Ambraseys *et al.* (1994, pp.50-1) describe effects in Egypt of the 18 March shock, and suggest placing the earthquake in the eastern Mediterranean. They think this was probably the Rhodes earthquake, but they date that to 15 March, thereby leaving the chronological problem unresolved. So the question is: one earthquake or two? Our research shows that we are dealing with a single event. But let us see how the date problem has been solved. Throughout the seismological tradition, the date 15 March 1481 has derived either directly from the work of Bosio (1594), or indirectly, through Coronelli and Parisotti (1688). But while Bosio is a reliable author, he is nevertheless a secondary source. Only by consulting Guillaume Caoursin (1496a), who was vice-chancellor of the Order of Knights Hospitallers of St. John during the dramatic period before and after the unsuccessful siege of the island of Rhodes by the Turks in 1480, have we been able to identify Bosio's chronological mistake. In an incunable published in 1496 and containing a number of his works, Guillaume Caoursin devoted one work specifically to the earthquakes of 1481. In this work, the first of the 1481 shocks is dated using the old Roman calendar: "*quindecimo kalendas aprilis*", which means "fifteen days before the Calends of April", that is to say not 15 but 18 March. Bosio made the mistake of turning "*quindecimo kalendas*" into "15 March". This chronological mistake would have had little significance in the case of an earthquake with a limited propagation area, but in this context, it appreciably distorts the seismic scenario. We can thus establish that on 18 March 1481, a single violent earthquake in the eastern Mediterranean struck Cyprus, Egypt and Rhodes.

The earthquake occurred at 13:15 UT (the eleventh hour): in Cyprus there were many collapses, at Nicosia (Lefkosia) in particular few buildings were able to withstand the earthquake. At Cairo people came out of their houses in panic, some architectural features fell off the Salihyya madrasa, and two people were killed. At Rhodes the shock was strong and frightening, but did not cause damage.

Historical sources: an overall view

There is evidence for the earthquake of 18 March 1481 in numerous sources. Set out below is a summary list of the sources we have utilised, subdivided according to the language in which they were originally written. The contribution of our research lies not only in an overall critical review of these sources, but also in identifying sources not previously used in a seismological context — especially those in Latin and Italian.

Latin and Italian sources

The most important primary source is Guillaume Caoursin, vice-chancellor of the Order of Knights Hospitallers of St. John, who devoted two works to these events. The first is exclusively concerned with the seismic events of that year, and is entitled *De terremotus labe qua Rhodii affecti sunt*. This writing was published in 1496 in a collection also containing other works of his. Francesco Suriano, a Venetian nobleman who subsequently became a Franciscan friar, called at Cyprus in August 1484 on his return journey from a visit to Jerusalem. In his *Trattato di Terra Santa e dell'Oriente*, he refers to damage caused by earthquakes of earlier years. There is also an echo of the shocks of 1481 — but especially of the tsunami — in a contemporary Latin chronicle from the Parma area in northern Italy, namely the *Cronica gestorum in partibus Lombardie et reliquis Italiae*. We think there is another reference to this earthquake in Marin Sanudo's *Vite dei Dogi*, though he mistakenly dates the Rhodes seismic sequence to 1492.

Byzantine sources

A *Notula* in manuscript Parisinus graecus 2632, fol.232r. (published in Naoumidou

1972-73, p.380), referring to collapses which Naoumidou himself (1972-73, pp.379-80) places in the island of Cyprus.

Arab sources

These consist of four chronicles by contemporary writers. The effects of the earthquake of 18 March 1481 in Cairo are described by al-Sakhawi, al-Suyuti, and Ibn Iyas, and by the Syrian historian Ibn Tulun.

Earthquakes effects by localities, based only on primary sources

Cyprus island

There were many collapses. The principal source is a *Notula* published in Naoumidou (1972-73, p.380): "On 18 of the month of March, in the year of Our Lord 1481, on the second Sunday of fasting [i.e. of Lent], there was a great earthquake at the eleventh hour of the day, which caused many collapses".

Μηνὶ μαρτίῳ ἡ' ἐχρονίας χ(ριστο)ῦ ἀυπα' κυρι(α)κ(ῆ) δευτέρα τῶν νησιῶν ἐγένετο σεισμός μέγας ὄρ(α) ἰα' τῆς ἡμέρας τοποῖον ἔκαμε πολλὰ χαλάσματ(α).

There is a reference in general terms to damage in Cyprus in the *Cronica gestorum*: "but worse things happened elsewhere, as a result of an earthquake and the fury of the sea, especially in Cyprus and Turkey".

sed alibi peiora tam ex terremotu, quam ex maris turbine sunt sequuta et maxime in Cipro et Turchi.

The phrase "fury of the sea" is probably a reference to the tsunami caused by the earthquake of 3 May 1481 (see the entry concerned).

Nicosia [or Lefkosia] (Cyprus island)

There was serious damage here; few buildings were able to withstand the earthquake. The source is Francesco Suriano, a Franciscan who visited Cyprus in August 1484 on his way back to Italy from Jerusalem. Unfortunately, he dates the earthquake simply to "the 1480s". In the text of the 1485 version of his work: "In the 1480s on the island of Cyprus the royal city of Lefkosia or Nicosia [...] was shaken and then reduced to ruins, as I saw the next year [in 1484, in fact! with my own eyes, by a terrible earthquake, to such an extent that few buildings remained whole and undamaged".

Nelli anni 1480 sopra la isola de Cypro, nella regale città de Levcossia overo Nicossia [...], fo concussa e al postuto disipata, sicomo io l'anno sequente viddi con li proprii ochii, dal terribile terremoto, ita et taliter che pochi palazi erano rimasti sani et integri.

There appear to be further details in a parallel passage in the 1524 version of Suriano's work. In our opinion, however, Suriano is actually referring here to the earthquake which struck Cyprus 10 years later, on 24 April 1491 (see the entry concerned). This is suggested by references to damage at the church of St.Sophia, and especially by mention of a "split" in a mountain, since these are effects recorded in the sources for the earthquake of 1491, but not that of 1481.

Cairo (Egypt)

Minarets were seen to sway, people came out of their houses in panic, and there was a certain amount of damage. Some architectural features fell off the Salihyya madrasa, killing two people. The Arab sources are four chroniclers and historians, who mention in particular the death of an important figure: the supreme *qadi* (judge), Sharaf al-Din b. 'Ayd al-Dimashqi. The historian Ibn Iyas provides the most detailed information: "In that month [*Muharram*] there arose a strong and impetuous wind which raised stifling clouds of yellow dust. This lasted from before midday until midnight; then,

immediately after this phenomenon, on Wednesday [actually Sunday] 17 of this month, there was a dreadful earthquake at old and new Cairo, which made the ground sway, shook minarets and caused them to lean at an angle, and a noise was heard coming out of the ground like that of a millstone grinding. This happened after the afternoon, and the earthquake continued shaking for about three *daraja*, with a swaying movement which frightened people, caused women to come out of their homes with their faces uncovered, and struck extraordinary terror into the population.

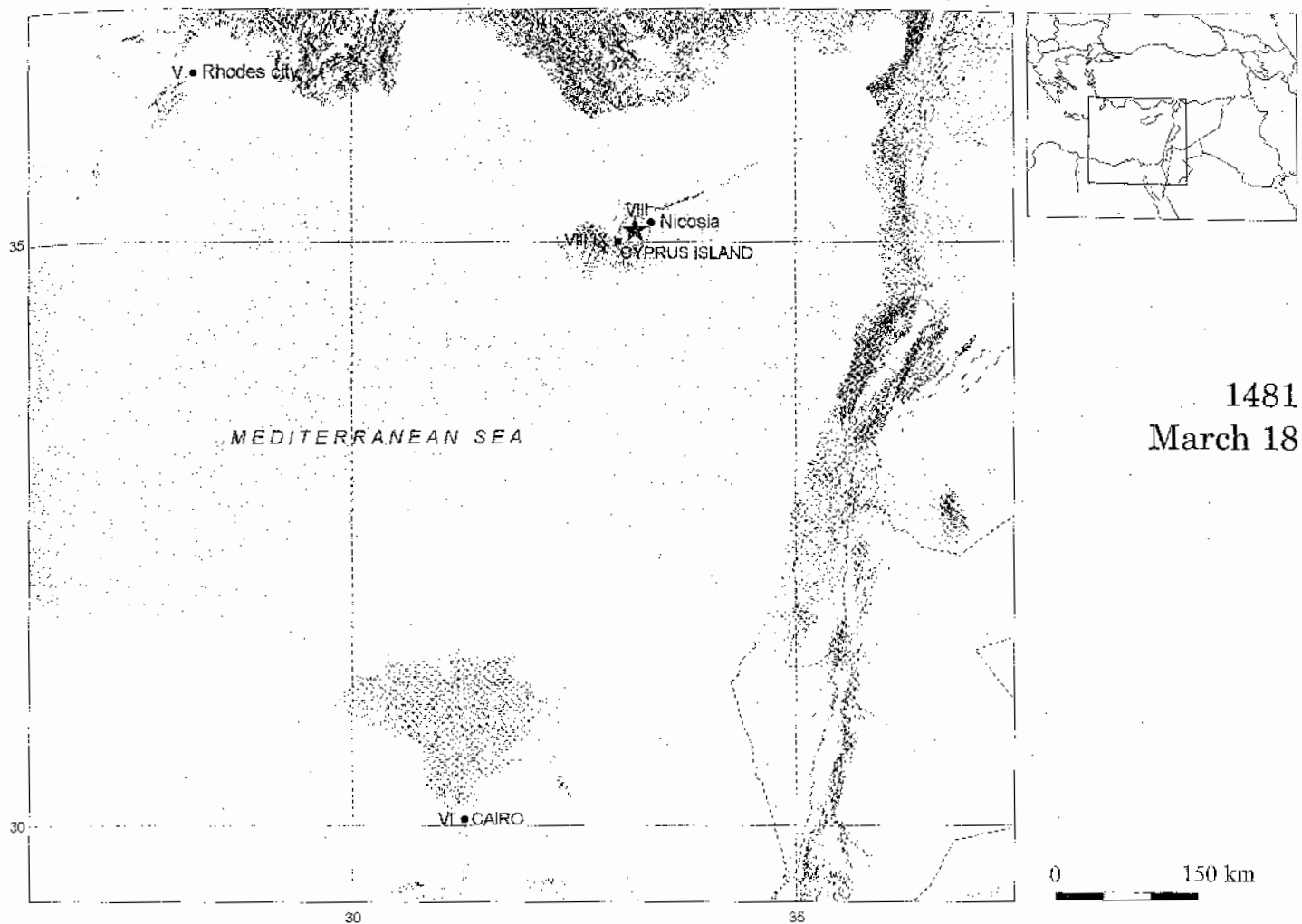
This earthquake caused the death of the supreme Hanafi *qadi*, Sharaf al-Din Musa b. 'Ayd al-Dimashqi: he was sitting beside the covered hall of the Salihyya madrasa and leapt to his feet when the earthquake struck, and material falling from the top of the hall struck him, killing him outright. He was a learned man, outstanding for his faith and works. The sultan had invited him to come to Cairo from Damascus, entrusting to him the supreme magistracy of the Hanafi court, where he remained in office for 58 days, until his death. The earthquake was the cause of his death. Musa b. Ahmad b. 'Ayd al-Dimashqi al-Hanafi came from 'Ajlun, had been a *qadi* at Damascus, and then took on the magistracy at Cairo when invited to do so. He was born in 830. When his funeral procession set out, the sultan came out of his citadel and led the prayers for him. He was buried in the desert. Immediately after him, al-Zayni Abu Bakr b. al-Qadi 'Abd al-Basit died in the earthquake. He was a former superintendent of the army and a man of great authority, a man who stood out from the crowd, being endowed with acumen and nobility, and one of the most intimate friends of the sultan. He was in fact ill at the time, and died of fright when his house swayed".

و فيه ثارت ريح شديدة عاصفة، و ثار منها غبار أصفر يأخذ بالأنفاس، و استمر من قبل الزوال إلى نصف الليل؛ ثم في عقيب ذلك في يوم الأربعاء سابع عشر هذا الشهر، كانت زلزلة مهولة بمصر و القاهرة، ماجت منها الأرض، و تحركت المآذن و مالت، و سعى للأرض دوي كدوي الرياح، و كان ذلك بعض العصر، فاستمرت نحو ثلاث درج و هي في اضطراب، حتى دهشت منها الناس، و خرجن النساء من البيوت و هن حاسرات عن وجوههن، و حصل للناس غاية الرعب. مات من هذه زلزلة قاضي القضاة شرف الدين موسى بن عيد الدمشقي الحنفي، كان جالسا بإيوان المدرسة الصالحية، فسقط عليه ساقط من أعلا الإيوان، فمات لوقته، و كان عالما فاضلا دينا خيرا، بعث السلطان خلفه من دمشق إلى مصر، و ولأه قضاء الحنفية، فأقام بها ثمانية و خمسون يوما و مات، و كان سبب موته من الزلزلة، و كان أصله من عجلون، و هو موسى بن أحمد بن عيد الدمشقي الحنفي، و كان تولى قضاء دمشق، ثم طلب و ولي قضاء مصر، و كان مولده سنة ثلاثين و ثمانمائة، فلما أخرجت جنازته نزل السلطان من القلعة و صلى عليه، و دفن بالصحراء. و مات من الزلزلة عقيب ذلك الزيني أبو بكر بن القاضي عبد الباسط، ناظر الجيش كان، و كان ريسا حشما، ناذرة في أبناء الناس، ذات شهامة و عظمة، و كان من أخصاء السلطان، و كان عليلا فمات مرجوفا من الزلزلة حين ماج به البيت.

Al-Sakhawi records:

"Before he [judge Sharaf al-Din b. 'Ayd] had completed two months in his post, the earth shook, and some pieces from the cornice at the top of the hall of the Hanbalites [followers of an Islamic school of law] in the Salihyya madrasa, which was where he lived, fell on him; this happened late on Sunday 17 *Muharram* in the year [88]6 [H. = 18 March 1481]. He died a martyr in this strange way. This filled people with sadness, and the sultan was present in person at the prayers for him, and at his burial within the confines of his own funerary monument. Ash-Shahab al Mansuri said: 'It was as though the earthquake had come to take him away and us as well'".

قبل استكمال شهرين من ولايته زلزلت الأرض و سقط عليه من أعلى حفة إيوان الحنابلة من الصالحية محل سكنه و ذلك آخر يوم الأحد سابع عشر المحرم سنة ست فقتضى غريبا شهيدا و تأسف الناس عليه كثيرا و شهد السلطان الحلاة عليه بسبيل المؤمني و دفنه بحوش تربته و كان الزلزلة كانت لفقده الله و إيانا قال الشهاب المنصوري.



1481
March 18

fig. 138

Al-Suyuti writes:

"On Sunday 17 *Muharram* [18 March 1481], in the late afternoon at old Cairo (*Misr*), there was a strong earthquake which caused the earth and houses to sway. Because of the earthquake, a merlon — or a piece of stone — plunged down from the top of the *Salihiyya* madrasa on to the supreme judge Sharaf al-Din Ibn 'Ayd, and killed him. The poet al-Shihab al-Mansuri wrote a poem about his very virtuous life, in which he made of pun about this noble man [*sharaf*] killed by a merlon [*sharaf*]².

The above is a paraphrase of al-Suyuti's words, since we are unable to render the pun involving the judge's name, his probity, and the Arabic word for a merlon.

زلزلت مصر يوم الأحد سابع عشر المحرم بعد العصر زلزلة صعبة ماجت منها الأرض والأبنية موجات وسقطت بسببها شرافة أو قطعة علسو من المدرسة الصالحية على قاضي القضاة الحنفي شرف الدين ابن عيبد فقتلته. فإنا لله وإنا إليه راجعون وقال صاحبنا شاعر عصره الشهاب النمصوري في ذلك: قد زلزلت مصر يوم مات بها قاضي القضاة المهذب الحنفي ما زال طول الحياة في شرف حتى انقضى العمر فيه بالشرف

There is a brief reference to the death of Sharaf al-Din in the work of the Syrian historian Ibn Tulun: "It is recorded that in that month [*Muharram*], news reached Damascus that judge Sharaf al-Din b. 'Ayd al-Hanafi was in Cairo and died in an earthquake in the grace of God, together with another person: a merlon fell on them from the

Salihiyya madrasa, and they died at the same moment. It was said that four other people were with them".

و فيه ذكر أنه وصل الخبر إلى دمشق بأن القاضي شرف الدين بن عيد الحنفي بمصر، توفي إلى رحمة الله تعالى، و معه شخص آخر، بواسطة الزلزلة كما قدمنا، سقطت شرارة من مدرسة الصالحية عليهما فماتا معاً، و قتيلا معهما أربعة أيضاً.

Rhodes (city)

The shock of 18 March was strong and frightening, but it did not cause damage at Rhodes. It was followed by frequent less powerful aftershocks which kept people in a state of apprehension. Our source is Guillaume Caoursin (*De terraemotu*). After reviewing the philosophers' theories about earthquakes, and referring briefly to the Turkish siege of 1480, he goes on:

"Indeed, while the minds of the people of Rhodes were in a state of tranquillity, and they were recovering a little from the scourge of the Turks, there was a powerful earthquake shock fifteen days before the Calends of April [18 March], at the ninth hour: it shook the earth violently and caused great terror to seize the minds of the people of Rhodes. Frequent lesser earthquakes followed the first, and they caused us no little anxiety.

Quiescentibus enim Rhodiorum animis et paululum a Thurcorum clade respirantibus, terre tremor validus quidem quindecimo kalendas aprilis, proxime decursi hora nona a solis ortu repente, editur, qui grandi cum impetu terram concutit, ex quo ingens terror Rhodiorum mentes incessit; sequuntur hunc assidui minores terremotus qui nos non parum anxios reddunt.

Marin Sanudo is probably also referring to this earthquake in his *Vite dei dogi*, though he incorrectly gives the date as 17 April 1492; his indication of the time coincides with that given by Caoursin and hence supports the suggestion that the earthquake in question is really that of 18 March 1481:

"In the year 1492, on 17 April, there was an earthquake at Rhodes, at the ninth hour, after sunrise, and further earthquakes were felt at various times that year".

Ne l'anno 1492, a di 17 april, fo teramoto a Rhodi, a horre nove, poi lievar dil sol, demum fo sentito molti altri terremoti per quello anno, in varii tempi.

▲	1481 03 18	13:15 UT	☉ = 35 05 33 11	I ₀ = VIII	Me = 5.6	Sites: 4	
localities	lat.	long.	I	localities	lat.	long.	I
■ Cyprus (island)	35 00	33 00	VIII-IX	Cairo	30 03	31 15	VI
Nicosia	35 10	33 22	VIII	Rhodes	36 26	28 13	V

< 357 > **1481 April 23 Nicosia [Cyprus]** doubtful event

source *Notula* in Spyridon and Eustratiadis (1925, p.148) and in Constantinides and Browning (1993, p.293)

catalogues d. Evangelatou-Notara (1993); *Papazachos and Papazachou (1997)

According to a Byzantine *Notula*, a strong earthquake struck Nicosia (or Lefkosia) in the island of Cyprus on 23 April 1481. Apparently the church of St.Sophia collapsed. There is a good deal of doubt about the date of the earthquake. The Byzantine *Notula* is in manuscript Athon. Laura ⊕ 91 (953), fol.318 (published in Spyridon and Eustratiadis 1925, p.148 and in Constantinides and Browning 1993, p.293). The text is as follows: "In [the year] of Christ 1481, on 23 April there was an earthquake which caused St.Sophia to collapse".

Εἰς τοὺς ἀσπᾶ Χριστοῦ, κγ' Ἀπριλίου ἐγένετο ὁ σεισμὸς ποῦ ἐχάλασεν ἡ ἁγία Σοφία.

Mention of a church of St.Sophia is the only clue to suggest a possible location. This St.Sophia is not the extremely famous one in Constantinople. Evangelatou-Notara (1993, p.110) and Constantinides and Browning (1993, p.293) point out that there is a church of St.Sophia at Nicosia in Cyprus. The date of the earthquake, as recorded in the above *Notula*, is somewhat puzzling, and suggests that we are dealing with a possible doublet. On the one hand, the day and month of the earthquake almost coincide with the later shock in Cyprus on 24 April 1491. There is in fact another Byzantine *Notula* which tells of the collapse of St.Sophia on that occasion. On the other hand, the lack of any other chronological information, such as the day of the week, prevents us from drawing firmer conclusions. Papazachos and Papazachou (1997, p.197) mistakenly locate the earthquake at Constantinople, because of the reference to the church of St.Sophia.

1481 May 3 Southern Aegean > tsunami < see entry < 359 >

< 358 > 1481 May 7 Lunigiana [Tuscany, Italy]

sources [manuscript] ASFlorence, *Otto di Pratica*, Carteggi, Responsive, filza 1, fol.213, Bartolomeo Pucci, Letter 10 May 1481

Cron. gestor., pp.94, 101; Palmieri Mattia, *Opus*, cols.269-70

historiography Sforza (1913)

catalogues d. Perrey (1848); Mallet (1853); Mercalli (1883); Giovannozzi (1895c); Benassi (1899); Baratta (1901); Milne (1911); Guidi (1915); *Boschi *et al.* (1995, 1997, 2000)

catalogues p. Giorgetti and Iaccarino (1971); Carrozzo *et al.* (1973); Postpischl (1985); CPTI (1999)

On 7 May 1481 at about 14:15 UT (the nineteenth hour, "Italian time") a strong earthquake struck the area central and eastern of the Lunigiana region (north-west Tuscany). The most seriously damaged locality was Fivizzano, where 17 houses completely collapsed and about 200 more were seriously damaged. There were also many victims. In the villages of Groppo San Pietro, Comano, Sassalbo and Verrucola, fortresses and towers suffered substantial damage. All these villages are in the present-day province of Massa Carrara. The earthquake was strongly felt at Lucca. Sixteen shocks occurred in a single day.

The information on this earthquake derives from four contemporary sources. The first of these is a letter sent by *capitano* Bartolomeo Pucci on 10 May to the *Otto di Pratica* a committee set up by the Florentine republic in 1480, their duties including responsibility for fortresses:

"Illustrious Gentlemen,

I write simply to inform your worships of the situation in which we find ourselves: in addition to many earthquakes on 6 February, a terrible earthquake occurred at the 19th hour on Monday 7 [May]. It destroyed 200 houses in this village [Fivizzano]; the fortress at Groppo San Pietro is reduced to ruins, except for the main tower, where the castellan took refuge; the fortress at Comano is in a bad state; that of Sassalbo is so badly damaged that it is uninhabitable [...]. The one at Verrucola is split open, and the castellan is living just outside; the tower where he lived is all split open and in ruins. I must give thanks to almighty God: because of some [shocks] which had occurred the previous night, I had left [my home] early with all my family; had they happened at night, most of my [family] would have perished. I am out in the country [lodging] in huts, and I cannot go back home again. When [the earthquakes] have stopped, I shall rent a few small rooms for a while. Since I have nothing to do, I am at your worships' disposal. Fivizzano 10 May 1481. Your humble servant B. Pucci *Capitano*".

Magnifici Domini mei ill[ustrissi]mi. Solo per dare notizia alle Vostre S. in che termini stiamo, oltre a molti tremuoti venuti da dì 6 di febbraio, lunedì a dì 7. [maggio] a ore

19. venne un tremuoto terribile, lo quale ha fatto rovinare in questo paese [Fivizzano] CC chase; la fortezza di Groppo San Piero tutta fracassata, eccetto la torre principale, nella quale s'è ridotto il chastellano; male in axetto la fortezza di Coman [Comano]; quella di Saxarbo [Sassalbo], fracassata in modo che non vi si può abitare [...] Quella di Verrucola aperta, il chastellano sta nel procinto; la torre dove stavo, tutta aperta e fracaxata. Ho da ringraziare lo justissimo Idio; per certi, che la notte innanzi eran venuti, con tutta la famiglia di buon'ora ero uscito; se di notte fussin venuti, la maggior parte de' mia sarebon periti. Io mi sto alla campagna con trabacche, e nella stanza non posso più tornare. Come haran cexati, per questo poco del tempo piglerò a pigione qualche stanzetta. Avendo coxa nexuna a fare, le Vostre S.comandino. Fivizani die X maij 1481. Servo B. Pucci Capitano.

This source allows us to date the main shock accurately to 7 May, which was indeed a Monday in 1481. The second source is codex 56 in the Biblioteca Palatina at Parma, a reliable late 15th century chronicle, which was published by Muratori (1733) with the title *Diarium Parmense*, and republished by Bonazzi (1904) with the new title *Cronica gestorum in partibus Lombardie et reliquis Italiae*:

"About half way through this month of May [1481], there was a very great and extraordinary earthquake in Lunigiana and especially in the village of Fivizzano, where seventeen houses were reduced to ruins and all the others split open; and many people were killed. And the rest abandoned castles and houses and lived in the fields. And the earthquake struck sixteen times here in twenty-four hours. And it was the same in nearby places".

Circa medium huius mensis madij fuit maximus et inauditus terremotus in partibus Lunesane et precipue in terra Fivizani, ubi corruerunt domus decem septem usque ad fundamenta et omnes alie domus aperte sunt, ubi multi mortui sunt; et reliqui exiverunt castrum et domos, habitantes in campis. Et hic terremotus in horis viginti quatuor vicibus sedecim apparuit. Et sic in locis illic vicinis id idem fuit.

The third source is the *Opus de temporibus suis* (1448-1482) by the Pisan writer Mattia Palmieri, which appears in the first volume of the continuation of the *Rerum Italicarum Scriptores* (ed. Tartini). Care has to be taken to distinguish this author, who died in Rome in 1483, from the very similarly named Matteo Palmieri, who died in Florence in 1474. Mattia Palmieri writes:

"1481. [...] In the month of May [...] A large part of the town of Ghivizzano in the territory of Lucca collapsed when the earth shook".

1481. [...] Mense Majo [...] In Lucensi agro Ghivisanum oppidum concussa terra magna ex parte corruit.

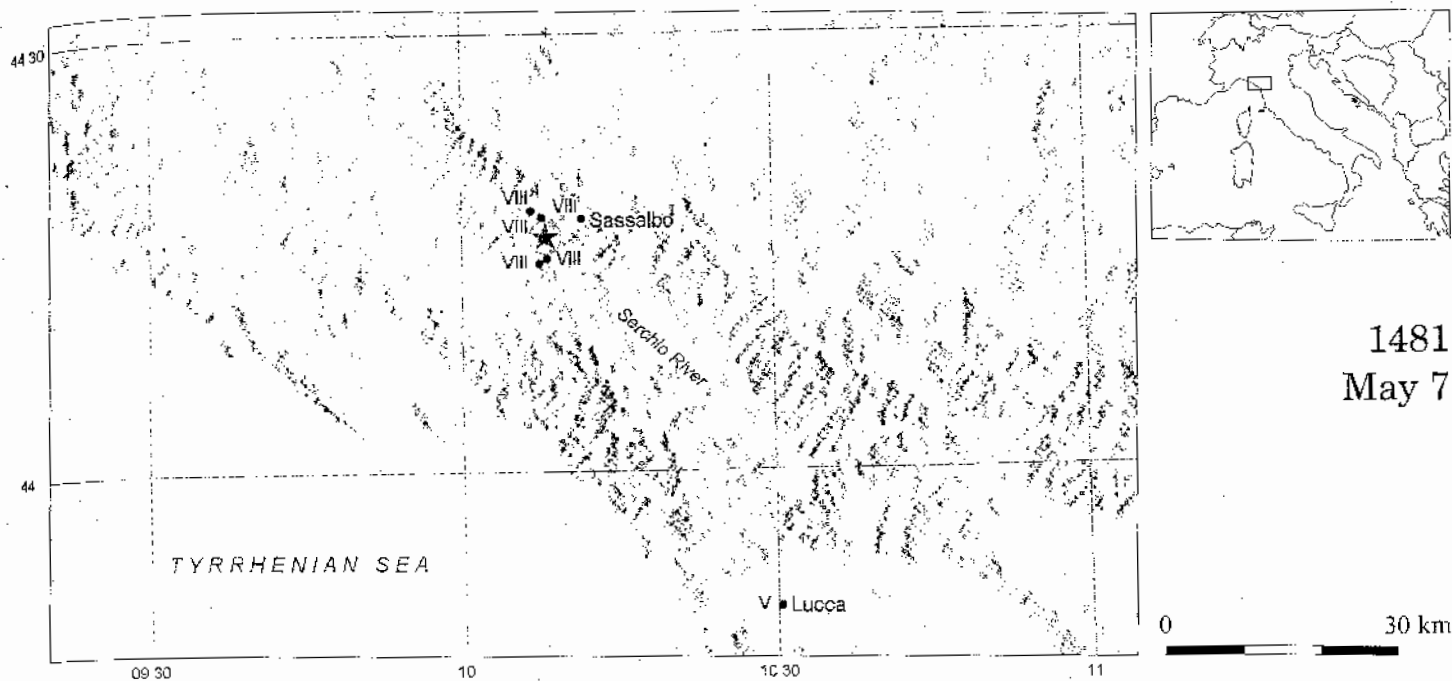
No specific date is given for what happened at Ghivizzano, a village about 40 km south east of Fivizzano, but since it appears after other information assigned to May, the earthquake referred to could be that of 7 May. The information provided has to be approached with caution, however, because of the striking similarity between the names Ghivizzano and Fivizzano: perhaps two villages have been confused.

The fourth source is recorded in Guidi's catalogue (1915, p.25), which draws on the *Diario* of Ruberto dal Portico, a contemporary author from Lucca:

"1481. 6 May, at the 16th hour [...] there was a very strong earthquake, followed shortly afterwards by a small one".

"1481. A di 6 Maggio, a hore 16 [...] fue un tremuoto assai grosso; dopoi appresso un piccolo".

The information in Ruberto dal Portico's *Diario* runs slightly counter to the letter from the *capitano* at Fivizzano, for the shock is dated to 6 instead of 7 May. This may therefore be a different shock in the same seismic sequence.



1481
May 7

fig. 139

▲ 1481 05 07 14:15 UT ★ = 44 16 10 08 $I_0 = VIII$ $M_e = 5.6$ Sites: 6

localities	lat.	long.	I	localities	lat.	long.	I
Comano	44 17	10 08	VIII	Sassalbo	44 17	10 12	VIII
Fivizzano	44 14	10 07	VIII	Verrucola	44 15	10 08	VIII
Groppo San Pietro	44 18	10 07	VIII	Lucca	43 51	10 30	V

< 359 > 1481 May 3 Southern Aegean ▷ tsunami ◁ [Greece]

< 360 > 1481 October 3 Rhodes

< 361 > 1481 December 17 Rhodes

< 362 > 1481 December 18 3:00 UT Rhodes

< 363 > 1481 December 18 5:15 UT Rhodes ▷ fissures ◁

< 364 > 1481 December 19 Rhodes

sources 1 Sixtus IV (pope), Brief, 1 June 1482, in Setton (1978, p.363); Guillaume Caoursin, *De terremotus; Oratio*; Suriano, *Il Trattato*, p.219; Leonardo da Vinci, *Codex Leicester* [formerly *Codex Hammer*], fol.10v. (ed. Calvi 1909, p.51); *Cron gestor.*, p.105; Plusiadenus, in Basileiou (1980, p.272); al-Sambudi, *Wafa'*, III, p.638; Sanudo, *Le Vite*, I, p.338

sources 2 Bosio (1594)

inscriptions 1. on the house at no.3, Ippoton street at Rhodes; 2. above a door of the Knights' Hospital at Rhodes, in Gerola (1914, p.291, note 4, p.295)

historiography Coronelli and Parisotti (1688); Baratta (1903); Gerola (1914); Papachristodoulou (1972); Setton (1978); Di Teodoro and Barbi (1983); Rigo (1992b)

catalogues d. Bonito (1691); Perrey (1850); Mallet (1853); Schmidt (1881); Sieberg (1932a); Galanopoulos

(1955; 1961); Ambraseys (1965); Ben-Menahem (1979); Galanopoulos (1981); Bektur and Alpay (1988); Evangelatou-Notara (1993); *Papazachos and Papazachou (1997);
 catalogues p. Ergin *et al.* (1967); Shebalin *et al.* (1974); Poirier and Taher (1980)
 catalogues Ts Galanopoulos (1960); Ambraseys (1962); Antonopoulos (1980); Papadopoulos and Chalkis (1984); Papazachos *et al.* (1986); Soloviev *et al.* (2000)

In the year 1481, the island of Rhodes was struck by a long sequence of strong earthquakes, one of which also gave rise to a tsunami. After the shock of 18 March (see the entry concerned), there were further earthquakes on 3 May, 3 October, and 17, 18 and 19 December. The earthquakes of 18 December caused very serious damage and many collapses. Although these earthquakes are clearly distinguishable, we have grouped them together in a single entry in order to avoid fragmenting the sources, and to provide an overall picture of this seismic crisis.

The following is the chronology of the earthquakes with a brief summary of effects (for details of effects and for sources, see below):

- May 3 6:30 UT: very strong shock but no damage at Rhodes; tsunami at Rhodes and Adalia;
- October 3 Very strong shock, but no damage at Rhodes;
- December 17 22:00 UT: at Rhodes strong shock, but no damage;
- December 18 3:00 UT: at Rhodes stronger shock, but no damage;
 5:15 UT: at Rhodes very serious damage and many collapses;
- December 19 5:15 UT: moderate shock at Rhodes.

Historical sources: an overall view

There is evidence for the 1481 earthquakes in numerous sources. Set out below is a summary list of the sources we have utilised, subdivided according to the language in which they were originally written. The contribution of our research lies not only in an overall critical review of these sources, but also in identifying sources not previously used in a seismological context — especially those in Latin and Italian.

Latin and Italian sources

These sources include reliable texts of specific relevance. The interest in the 1481 earthquakes which these sources show may well have been intensified by the fact that, as mentioned above, the island of Rhodes had suffered a long siege by Turkish troops in 1480. Although the attack was repulsed, it caused great alarm, and the keen attention it attracted to Rhodes evidently persisted and took in the events of the following year.

CHRONICLES AND TREATISES

The most important primary source for the effects of all the shocks and the tsunami which struck Rhodes in 1481 is Guillaume Caoursin, vice-chancellor of the Order of Knights Hospitallers of St. John, who devoted two works to these events. The first is exclusively concerned with the seismic events of that year, and is entitled *De terremoto labe qua Rhodii affecti sunt*; the second is a speech he made before the Senate of Rhodes on 31 May 1481, on the occasion of the death of Mehmed II, and is entitled *Oratio in Senatu Rhodiorum de morte magni Thurci*. Both these writings were published in 1496 in a collection also containing other works of his.

Francesco Suriano, a Venetian nobleman who subsequently became a Franciscan friar, called at Rhodes in September 1484 on his return journey from a visit to Jerusalem. In his *Trattato di Terra Santa e dell'Oriente*, he refers to damage caused by the war and earthquakes of earlier years. There is also an echo of the shocks of 1481 — but especially of the tsunami — in a contemporary Latin chronicle from the Parma area in northern Italy, namely the *Cronica gestorum in partibus Lombardie et reliquis Italiae*.

There is also a note by Leonardo da Vinci in the *Codex Leicester* (formerly *Codex Hammer*) at fol.10v. (ed. Calvi 1909) which may refer to the Rhodes shocks, and reports a tsunami near Adalia (now in southern Turkey).

We think that Marin Sanudo is also referring to these earthquakes in his *Vite dei Dogi*, though he wrongly dates the seismic sequence at Rhodes to the year 1492.

DOCUMENT

Anxiety about the fate of the people of Rhodes comes through quite clearly in a brief issued by pope Sixtus IV (1471-84) on 1 June 1482, concerning financial measures to be taken in order to facilitate rapid repairs, and avoid the abandonment of the island by its inhabitants (Setton 1978, p.363).

INSCRIPTIONS

We have also made use of two inscriptions at Rhodes which refer to reconstruction work (Gerola 1914, p.291, note 4, p.295):

□ 1 – on the house at no.3, Ippoton street, dating to 1483;

□ 2 – above a door to one side of the principal façade of the Knights' Hospital, dating to 1489.

Byzantine sources

A so far unpublished Homily (no.VI) by the bishop and theologian John Plusiadenus. The homily is in Brux. manuscript IV 434, fol.46v. (Basileiou 1980, p.272), and makes reference to the Rhodes tsunami.

Arabic sources

Al-Samhudi tells of serious damage on the island of Rhodes in December 1481, basing himself on news brought to Alexandria by sailors arriving from Rhodes.

Effects of the earthquakes and the tsunami at Rhodes and Adalia

Rhodes

May 3

At about 6:30 UT (about the third hour): the earthquake was very violent, but did not cause damage. However, the town of Rhodes was flooded by a tsunami which reached a height of about 3 metres (more than 10 feet). Immediately afterwards, the sea flowed back and returned to its normal level. A ship anchored in the harbour was thrown on to the rocks and sank. There were frequent aftershocks, which contributed to a weakening of buildings.

The sources are the two works by Guillaume Caoursin (published in 1496), Suriano's account of his journey (version of 1524), a contemporary chronicle from the Parma area, a homily by John Plusiadenus, and Marin Sanudo's *Vite dei Dogi*. Guillaume Caoursin's first work (*De terremotus labe qua Rhodii affecti sunt*) provides the most detail:

"However, the exhalation increased, and a very strong shock occurred five days before the Nones of May [3 May], at about the third hour, bringing with it a flood which struck terror into the inhabitants of Rhodes. And so, because of contrary exhalations, that is to say one which shook the earth and another which disturbed the sea, a wave more than ten feet high threatened death and destruction as it flowed over the town, and then the sea soon flowed back again, descending as many feet as it had risen, and after a certain time it grew calm again, remaining within its established limits, as we have described in our recently published celebration of the death of the great Turk. But the earthquake was not accompanied by any destruction; though one merchant ship which lay at anchor was thrown on to the rocks by the force of the sea, broke up on impact, and sank. There is no doubt that this earthquake caused great terror because of the flood from the sea. There was alarm throughout the town, in fact. Many people of all ages sought refuge from this great and extraordinary danger, and they prayed for divine assistance, making their way towards the sea, carrying the symbols of Christ and the saints. But the shaking of the earth did not cease, day and night, all the days

of that year, affecting the roofs of houses and other buildings, and the foundations and joints of walls, thereby making it easy for them to collapse [...].

Tandem exalatione coalescente, quinto nonas maii tremor validissimus, hora diei ferme tertia, erumpit qui, diluuium preseferens, Rhodios terrore concitavit. Contrariis namque exalationibus, altera quidem terram propulsante, altera mare agitante, fretum supra decem pedes elevatum, interitum exterminiumque minitans, urbem inundavit moxque refluens, quot pedes auctum est, subsidit ac temporis decursu equor reditur prefixosque limites tenuit, sicut in congratulatione de excessu magni Thurci nuper edita annotavimus. Eum ipsum tamen terremotum iactura nulla sequitur: sola quidem navis oneraria, anchoris subnixa, maris ebullitione cautes attigit, ictusque impetu elisa mergitur. Ingenti profecto terrore ob maris inundationem is motus extitit. Tota enim urbe trepidatum est. Multi mortales, omnisque etas, ad inauditum visendum discrimen concurrunt invocatoque divino presidio, cum Christi et sanctorum insigniis mare petunt. Nec cessant totis diebus eiusdem anni, interdum noctuque, motus terram propulsantes, qui domorum edificiorumque tecta, bases parietumque compages, quatiant ad facilemque ruinam disponant.

Guillaume Caoursin's second work (*Oratio in Senatu Rhodiorum de morte magni Thurci*) is devoted to the death of Mehmed II (3 May 1481). Set out below are the passages concerning the earthquakes and the tsunami:

"For about the time of his departure from life, frequent earthquakes occurred in Asia, Rhodes, and the islands roundabout, especially two of the most marked severity, which were so great and terrible that they laid low many castles, strongholds, and palaces. Even the sea rose more than ten feet and flooded the shores, and straight away rolling back into the deep, it sank as many feet as it had risen, and finally flowed back to its accustomed level. So abundant in fact was the exhalation and so great the esplosion [pressure?] confined within the caverns of the earth, that seven times it sent through the earth its violent shocks and caused a sudden outflow of the sea. The phenomenon is worth recording, and something the Rhodians have never seen before. Although it is explicable by physical principles, nevertheless it usually portends some great event". [trans. Setton]

Circa enim dies sui excessus in Asia, Rhodo insulisque adjacentibus, frequentes terremotus editi sunt, duo presertim velocissimi, qui adeo ingentes et horrendi fuere ut plura castella, arces palaciaque prostrata sint. Ipsum quoque mare, elevatum supra decem pedes, riparum limites exivit et illico, in ymum refluens, tot pedes quot sublevatum est, subsidit demumque, fluxu suo, ad equalitatem ductum est. Tanta quippe fuit exalationis copia atque velocitas intra terre cavernas conclusa, ut sepius terram acriter percusserit et repentino exitu mare commoverit eoque ingens admiratio Rhodiorum animos incessit, res quidem memoratu digna, nec iam pridem ab Rhodiis visa que, licet phisicis principiis hereat, quippiam tamen protendere solet.

In the text of the 1524 version of his work, Suriano describes the tsunami at Rhodes; but he wrongly dates the earthquakes to 1482 instead of 1481, and although he does not give an exact chronology for the shocks, he seems to mistakenly associate the tsunami with the seismic events of December 1481, which did indeed occur at night, instead of the shock of 3 May:

"Furthermore, in eighty-two, the town of Rhodes was completely reduced to ruins one night by earthquakes, and many people were killed. The castle of the Grand Master also collapsed, and our convent of St. Mark. That same night, the sea water left its bed with such force that it overflowed its usual limits and flooded the square, as far as where the carriages stand, and the people thought that the town would end up under water. Everyone sought the aid of the Virgin Mary, for they remembered that she had saved them from the Turks, and they went down to the water with images of her, weeping and crying out: 'Theo Hcochie partene voi bison ymas' [= Θεοτόκε παρθένε, βοήθησον ἡμᾶς].

Thanks to her prayers and intercession, the sea returned to its normal place and limits, and the town was saved from disaster at its hands”.

Item, ne l'otanta doi, ne la città de Rhodi, per li terremoti una notte tutta ruinò et amazò molta gente. Cascò etiam el castello del Gran Maestro e lo loco nostro de San Marco. In quella notte etiam, l'acqua del mare fugite dal suo letto con tanto impeto, che le nave, che erano nel porto, tute se spezorno. Da po' ritornò con tanto impeto, che pasando li soi termini, se profundò la piazza, fino dove sono le berline, credendo el populo ch'al postutto la città se sommergesse. Recorsero tuti al suffragio de Maria, recordandose quella averli liberati da li Turchi, e con le imagine soe andorono contra le acque vociferando con pianti e dicendo: 'Theo Hcochie partene voi bison ymas'. Mediante le soe prece et intercessione ritornò el mare al suo loco e termini, e la città fo liberata dal suo excidio.

There is also a reference to the Rhodes tsunami in an unpublished homily (no.VI) by bishop and theologian John Plusiadenus (Basileiou 1980, p.272):

“[...] consider the state to which Constantinople, Euripus and many other cities and regions were reduced. Not much time has gone by since then, less than eight years! And what happened at Rhodes when the sea water penetrated into the midst of the town. The sea went beyond its limits and, swelling more than it should, entered the town! And then it returned to its place”.

[...] βλέπετε εἰς τίνα τρόπον ἦλθεν ἡ Κωνσταντινούπολις, ἡ Εὐριπος, καὶ πολλὰ ἄλλαι πόλεις καὶ χώραι· οὐ πολὺς ἐστὶ χρόνος, οὐδὲ ἔτι εἰσὶν ἔτι ὀκτώ. Καὶ τί γέγονεν ἐν Ῥόδῳ ὅτι εἰσῆλθε τὸ τῆς θαλάσσης ὕδωρ μέσου τῆς πόλεως· ἡ δὲ θάλασσα ἐξῆλθεν ἐξω τῶν ὁρίων αὐτῆς, ὀγκωθεῖσα δὲ ἔξω τοῦ δέοντος εἰσῆλθεν ἐντὸς τῆς πόλεως, εἶτα ἐστράφη εἰς τὸν τόπον αὐτῆς.

Plusiadenus wrote these words because of the impression made on him by a succession of tragic events: the disasters at Constantinople (1453) and Calchidus (1470), and then the one at Rhodes in 1481. Plusiadenus' comments were made shortly afterwards, in the heat of emotion, for he thought he could see in these events clear signs of the approach of the end of the world. According to Basileiou, the homily was written after 1488/89, because, in his opinion, the eight years referred to the period after the Rhodes earthquakes. But the fact is that, in interpreting these disasters as foreshadowing a catastrophe, Plusiadenus is indicating that the end of the world would come in less than eight years' time, echoing the contemporary view that it would come in 1492 (Rigo 1992b). The homily therefore dates to about 1484. There is an echo of the earthquakes of 1481, but more especially of the tsunami, in the *Cronica gestorum*. This chronicle gives the incorrect date of 15 June, but uses information from letters received:

“Letters from Rhodes also report that on the fifteenth day of June [1481], there were very great earthquakes in those parts, the biggest being in Turkey, and some towns were reduced to ruins; and they report that this earthquake struck seven times with such violence that almost all the people of Rhodes fled from the town to places where they would be least uncomfortable; and that a storm at sea such as had never before been seen or heard continued unceasing for an hour, to the extent that many ships were submerged and the water penetrated up to two miles inland; and that in the harbour at Rhodes there was a tremendous and extraordinary shaking and crashing together of ships, with broken oars, masts and rudders, and a Genoese ship of fifteen hundred *botti* went to the bottom — a ship which on other occasions had brought help to the people of Rhodes during the Turkish siege; and that for this reason the whole town devoted itself to prayers and devout processions, until the sea became calm again”.

Ex Rodo etiam habentur littere, quod quintodecimo junij illis in partibus maximi apparuerunt terremotus et maiores in Turchia, et quod aliquae civitates demerse et ruinate sunt: quodque hic terremotus septies processit com tanto impetu, quod quasi omnes Rodiani ex urbe fugerunt, ubi minus incomodum illatum est, quam alibi;

quodque in mari nonquam visa nec audita est talis tempestas spatio hore perseverans, adeo quod multe naves submerse sunt et in terra firma aqua ad duo milliaria prodijt; quodque in portu Rodi fuit navium ingens et inaudita conquassatio et collusio ad invicem, cum fractione remium, arborum et temomum, ubi navis quedam Januensis mille quingentarum bottarum ad fondum petijt, que alias in obsidione illic Turchorum Rodianis auxilium tulerat; et quod proinde totta civitas orationibus et devotis processionibus se dedit, adeo quod mare ad tranquillum redijt.

In Marino Sanudo's *Vite dei Dogi* we read:

"[...] and on 3 May [1492, but in reality 1481] there was a great [earthquake], at the 3rd hour of the day, which seemed to bring a flood of water over the land. The sea rose 10 feet and came on to the land and then went back, and yet this [earthquake] did not destroy anything, only damaging a merchant ship which lay at anchor in the harbour: the movement of the sea caused it to capsize. The people of Rhodes were extremely frightened and went in procession; and so, throughout that year, earthquakes were felt day and night".

[...] et a di 3 mazo ne fo uno grande, a horre 3 di zorno, che pareva fosse un diluvio di aque in la terra. Il mar si levo X piedi piu alto, et vene in la terra, et poi torno in mar, tamen questo non ruino, né fe' altro danno cha una nave di merchadantia erra im porto a l'ancora, per il mover dil mar, quella si trabaltoe. Fo fatto per Rhodiani, pieni di grandissima paura, precessione; e cussi, tutto quel anno, di e note si sentiteno terremoti.

Adalia

At Adalia (present-day Antalya), which lies on the southern coast of Turkey between Rhodes and Cyprus, the sea parted, revealing its floor. The source is a note by Leonardo da Vinci in the *Codex Leicester* (formerly *Codex Hammer*) at fol.10v.:

"In eighty 9 an earthquake occurred in the sea off Adalia near Rhodes, as a result of which the sea bed opened up, into which such a quantity of water poured that for over three hours the sea bed was left uncovered by reason of the waters being removed from it, and then it closed again to the former level".

Nello ottanta 9 fu uno terremoto nel mar di Satalia, presso a Rodi, il quale aperse il mare co el fondo, nella qual apertura si sommerse tal diluvio d'acque, che per più di 3 ore si scoperse il fondo del mare, dell'acque, che di quivi si spogliorono, e poi si richiuse al primo grado.

According to Baratta (1903, pp.197-8), Leonardo means 1489 when he writes "ottanta 9", but as Baratta himself agrees, this is likely to be a reference to the earthquakes which struck the island of Rhodes between March and December 1481. Antonopoulos (1980, pp.192-4), on the other hand, thinks Leonardo is alluding to a tsunami which really did occur in 1489, caused by an earthquake which probably struck the southern coast of Asia Minor.

October 3 Rhodes

This shock was of similar intensity to the one on 3 May, simply striking terror into the inhabitants of Rhodes. The shocks only lasted for a few days.

Guillaume Caoursin (*De terremotus*) and Marin Sanudo's *Vite dei Dogi* are again the sources. According to Guillaume Caoursin:

"Of these [earthquakes], the one which spread terror occurred five days before the Nones of October [3 October], for the terror it brought was similar to that in May when the sea boiled in fury, but in fact the earthquakes died down in a few days [...]"

Inter quos terrorem attulit is qui quinto nonas octobris contingit, qui eius qui mayo evenit maris ebullitione persimilem quidem pavorem presefert, id vero paucos dies terremotus sopiti sunt.

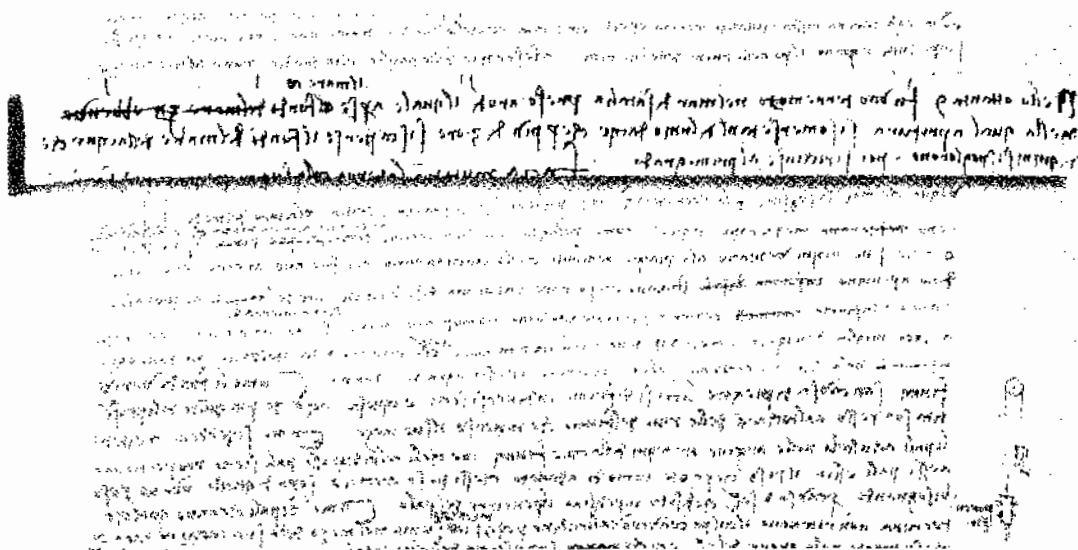


fig. 140 Leonardo da Vinci: *Codex Leicester* (formerly *Codex Hammer*) fol.10v. The note (in the foreground) in Leonardo's characteristic mirror writing records effects at Antalya of the tsunami associated with the earthquake of 3 May 1481. Transcription and translation on p.782.

Marin Sanudo seems to be misinterpreting his source when he states that this earthquake, too, affected the sea, but as can be seen above, Caoursin is simply making a comparison between the shock of 3 October and that of 3 May — the only one of the two to cause a tsunami. Sanudo writes:

“On 3 October [1492, but in reality 1481] there was a great (earthquake), and the sea was greatly disturbed.”

A di 3 octubrio ne fo un grande, che 'l mar fece gran boiamento.

Further strong shocks, including the one which had the most serious effects, are recorded as having struck Rhodes on the following three days (in order to preserve the unitary nature of the texts, the passages from the sources concerning the following four shocks have not been separated: they all appear after the descriptions of effects of the shocks themselves):

Rhodes

At about 22:00 UT (the sixth hour of the night); the shock awoke the inhabitants of Rhodes from their sleep in fright. Some took refuge in the open air, and others in church buildings, while some remained in their homes. December 17

At the tenth hour of the night (3:00 UT) there was a shock more violent; it frightened the people again, and cries of terror were heard; December 18

At the eleventh hour of the night (5:15 UT), shortly before dawn occurred a shock. This shock was the most serious of the whole sequence. It caused buildings to collapse in Rhodes, especially churches. The roofs of country houses collapsed or were badly damaged; public buildings and the towers of the harbour fortifications were also damaged, and the tower of S.Nicola and the *palazzo* of the Grand Master collapsed, and the Franciscan convent of S.Marco was rendered unusable. Movement around the town was impeded by the debris; and many houses were shored up because they were in danger of collapse. Cracks appeared in the earth. The panic-stricken people built wooden shacks as safer living quarters. There were some victims, but the actual number is not given.

At about 5:15 UT (about the twelfth hour). The shock was not very violent. December 19

The sources are Guillaume Caoursin (*De terremotus*), Suriano's account of his travels, the Arab chronicler al-Samhudi, and Marin Sanudo's *Vite dei Dogi*.

Guillaume Caoursin writes: "[...] Finally, the natural causes of this shock increased and built up, so that three shocks occurred fifteen days before the Calends of January [18 December], near the winter solstice, and they caused the earth to shake strongly. Indeed, the first shock occurred at the sixth hour of the night and woke the inhabitants of Rhodes with a start, but in fact they were not frightened. Some settled in the open air, keeping clear of roofs, others went into church buildings, while others remained at home, beneath ceilings or at wall corners. There followed another shock, more violent than the rest (at about the tenth hour of the night), which frightened us, and when it happened, loud cries were heard. While everyone was struck with terror, another stronger one occurred and shook the town. Now shaking, now swaying and then pushing in one direction, it shook the ground and knocked down and destroyed buildings, at the twelfth hour of the night, shortly before dawn, amid people's feeble cries. This was preceded by a close series of earthquakes, and some cracks appeared in the earth. Throughout the town in the darkness we were certainly alarmed, many people were knocked down in the streets by collapsing buildings; and also some of those who stayed in their homes were engulfed in collapsing roofs. If you had heard the shouts of the men, the loud wailing of the women, the weeping of children and the cries of infants! In that same earthquake, indeed, church buildings, chapels and oratories were razed to the ground, their foundations completely gave way, as well as the framework of the walls. Peasants' houses and also all the roofs of those who dwelt in the country collapsed, were broken to pieces, fell down or were in danger of doing so; and indeed public buildings and even the towers (which protect the harbour entrance) were not left unscathed. If in fact some part of buildings was left standing, it was so weakened as to require rebuilding, and one could no longer see the tower of S. Nicola, which stood where there had once stood the colossus of Rhodes, which collapsed in an earthquake (fifty-three years after it was cast and erected there). One wept at the fearful sight of the terrible damage to the town of Rhodes, and was deeply affected by the great cries of the inhabitants, in their affliction and grief. Some inhabitants had been so struck with terror at the shocks that they had abandoned their homes in the town or the fortress, and had built wooden houses everywhere, taking refuge in them with their wives and children, and their servants as well. Indeed, the collapsed buildings impeded our access, and those parts of buildings which remained standing were shored up with wooden props, and barely continued to stand on their foundations. On the following day [19 December], at the end of the night, at about the twelfth hour, there was a less violent shock and a familiar wind accompanied it (the African storm wind, accompanied by downpours of rain): this disturbed, frightened and agitated the people of Rhodes. There arose the feeble cries of the people, and everybody felt great fear creeping into their minds".

Demum, eius tremoris naturalibus causis auctis accumulatisque, quindecimo kalendas ianuarii, circa hyemale solsticium, motus tres eduntur, qui validissime terram quatunt. Primus quidem tremor hora sexta noctis eius diei fit, qui mortales somno repente excitat: Rhodii quidem perterriti, de salute providentes, alii tecta exeuntes propatulo se constituunt, alii sacras edes intrant, alii sub fornicibus aut parietum angulis domi se continent. Alius sequitur terremotus ceteris vehementior (hora ferme noctis decima) qui nos perterrit, ad cuius concussionem ingentes quidem eduntur clamores. Dum omnes pavore essent attoniti, evenit alius qui validus his solum conculit; modo vibrando, modo undando, modo in unam partem impellendo, terram quatit et, cum flebili mortalium clamore, hora duodecima noctis, paulo ante diluculum, edificia subvertit diruitque; post crebros quoque motus qui hos precessere, etiam quedam terre rima patuit. Tota quidem urbe tenebris trepidatur, multi mortales edificiorum collabentium ruina vicis prosternuntur, quidam quoque domi se

continentes, tectorum lapsu conteruntur. Audisses virorum clamores, mulierum eiulationes, puerorum fletus, infantium vagitus. Eo ipso profecto terremotu, sacre edes, sacella oratoriaque solo equata et bases, parietum compages perfringuntur. Civium domus, queque etiam incolarum tecta, dirupta, fracta, lapsa vel ruinam minantia; palacia vero magistratus, turres etiam (que portus aditum muniunt) incolumitatem non servant. Si quid enim edificiorum superest, adeo imbecille sit ut erectione egeat, nec expers discriminis turris Sancti Nicolao dicata conspicitur, que eo loco sita est ubi Rhodius collossus olim locatus fuit, qui terremotu (cum annos tres et quinquaginta ante steterat posteaquamque fusus erectusque fuisset) corruit. Deplendum monstruosumque videre est urbem Rhodiam ita labefactam summoque civium clamore, angore ac dolore afflictam, qui tremoris pavore perterriti, tectis relictis urbis arcisque, passim ligneas casas sibi struxere, quibus se, uxores, liberos, familiam quoque protegunt. Nam ea ipsa labes domorum aditu nobis interdicit, atque edificiorum pars superstes, tignis innixa, vix basibus heret. Postridie eius deflende lucis noctu, hors fere duodecim, non tam gravis oritur tremor, que ventus notus (demum procellosus Africus nymbosis ymbribus commixtus) sequitur: hic Rhodios molestat, inquietat atque turbat. Mortalium clamor oritur flebilis, cunctorumque animos grandis terror incessit.

Francesco Suriano stopped at Rhodes in September 1484, and refers in two passages in his work to damage suffered at the convent of S.Marco which belonged to his fellow Franciscans. The building was still unusable almost three years after the earthquakes, which he wrongly dates to 1482. In the 1524 version of his work we read: "Furthermore, in eighty-two, the town of Rhodes was completely reduced to ruins one night by earthquakes, and many people were killed. The castle of the Grand Master also collapsed, and our convent of S.Marco".

Item, ne l'otanta doi, ne la città de Rhodi, per li terremoti una notte tutta ruinò et amazò molta gente. Cascò etiam el castello del Gran Maestro e lo loco nostro de San Marco.

The 1485 version of his work contains the following:

"We spent six days at that port [Rhodes], and were very unhappy that we friars were so numerous, because our convent, which was outside the town, had been reduced to ruins in the war against the Turks, and what had been given to us inside the town had been reduced to ruins in the earthquake. We took our rest as best we could on straw in wooden shacks".

In questo porto dimoramo sei dì, et noi per esser frati assai, staemo assai poco contenti, perochè lo loco nostro che stava fure della città, era stato ruinato nella guerra del turcho, et quello che era stato dato dentro della terra, era per lo terramoto ruinato. Al meglio potemmo ne riposammo sotto alcune capanne de tavole, nella paglia.

Unlike the other Arab sources which record the shock of 18 March (see the entry concerned), al-Samhudi reports serious damage at Rhodes, on the basis of news brought to Alexandria by sailors who arrived there from Rhodes in late 1481. He does not put an exact date to the earthquakes, for he gives them an ideological interpretation as a divine punishment for Christian celebrations after the burning of Mecca in October – November 1481:

"When news of the fire [at Mecca, where it destroyed the Ka'ba mosque in *Ramadan* 887 H. (24 October – 22 November 1481)] reached Rhodes, which is Christian territory, the population received it with great joy, making great celebrations as the bells rang out. But before the end of that day, God sent them a tremendous earthquake, which destroyed one whole side of the town walls, the church, and a large proportion of its houses. Innumerable people were killed. The shocks lasted for days. I read this news in messages from the coast at Alexandria, sent by trustworthy people who

had obtained their information from sailors who left Rhodes at the very time of the earthquake, when the islanders were pulling the dead from the debris, after the survivors had abandoned the town. This prodigy was considered to be a sign from heaven”.

ولما وصل خبر الحريق لرودس من بلاد النصراري أظهروا بذلك فرحا واستبشارا وتظاهروا بالزينة وضرب النواقيس فلم يمض ذلك اليوم إلا وقد أرسل الله عليهم زلازل عظيمة هدمت عليهم جانبا من سورالبلد والكنيسة وكثيرا من دورهم وهلك منهم بذلك خلائق لا يحصون ودامت الزلازل عليه أيام شاهدة ذلك في كتب وردت من ثغر اسكندرية بخط من يعتمد عليه وذكروا أن المخبر لهم بذلك أهل المراكب الواردة من رودس المذكورة وأنهم سافروا والزلازل مستمرة بها وهم يخرجون الموتى من تحت الهدم بعد انتقال من بقي إلى خارج البلد فتأمل هذه المعجزات النبوية.

With his usual chronological mistakes, Marin Sanudo writes:

“[...] then, on 18 January [1492, but in reality on 18 December 1481], at about the time of the winter solstice, three very great earthquakes occurred in succession, effectively causing a good deal of destruction in the town. The first was at the 6th hour of the night, the next at the 10th hour and the next at the 12th hour. The earthquake also destroyed a large number of houses churches and other buildings, and many people were found dead in the ruins, and all one could hear throughout the town were the great cries of men, the wailing of women and the weeping of children. The whole town was badly shaken, and the harbour towers were badly affected, especially that of S.Nicolò [...] There were continuous processions in Rhodes, with many prayers for divine assistance, and there was fasting and almsgiving. Then, when the earthquakes ceased, they set about rebuilding the town walls etc.”.

[...] poi, a di 18 zener, circha hiemale solsticium, vene in una tre terremoti grandissimi che quaso e ruino molto la terra. Il primo a hore 6 di note, l'altro a hore X, l'altro a horre 12. Adeo assa' caxe, chiexie et hedificii ruinoe, et molti in le ruine fo trovati morti, adeo in la terra non si sentiva altro cha gran clamori di homeni, ululati di femene, pianti di fanziuli. Tuta la tera fo conquassata, e le torre dil porto si resentino molto, maxime quella di San Nicolo [...] Continuamente in Rhodi si feva precession, dicendo molte oration, implorando il divino ausilio, ieiunando et facendo elimosine. Qual, cessato li terramoti, si atese a riconzar le mure, etcetera.

Although the following texts refer to shocks to which it is impossible to ascribe a specific date, they do refer in general to the 1481 earthquakes. Anxiety about the fate of the inhabitants of the island of Rhodes is expressed in a brief issued by pope Sixtus IV (1471-84) on 1 June 1482:

“Furthermore, it has come to our notice that the island of Rhodes has been so shattered by earthquakes that, if it does not receive aid, its inhabitants will be obliged to abandon it, and that could be of considerable detriment to the Christian world, because the island has always been a uniquely important bulwark for the defence of the faith against the perfidious Turks”.

Nuper, ut accepimus, insula Rhodi adeo terremotibus quassata est ut, nisi de aliquo presidio succurratur, cogantur illius incole eam omnino deserere, quod magnum Christiane reipublice detrimentum afferre posset cum semper unicum fidei adversos perfidos Turcos propugnaculum fueri.

There are two inscriptions in Rhodes, dating to 1483 and 1489 respectively, which do not refer to the earthquake explicitly, but record the reconstruction and restoration of the Knights' Hospital and other buildings.

On the house at no.3, Ippoton street, above a ground floor archway over which there is a coat of arms, there is a marble plaque bearing an inscription which mentions the restoration of the building:

"The Very Reverend Dominus Brother Pietro Papefust restored the foundations in 1483".

R(everendissimus) D(ominus) F(rater) Pe(trus) Papefust, bases restauravit 1483.

In Gerola's commentary (1914, p.295), it is stated that the lower floor of the building, which served as a convent residence, had been restored by Papefust, after suffering damage in the earthquakes which struck the island in 1481. Above a door to one side of the principal façade of the Knights' Hospital, there is an inscription, engraved in stone, which records the reconstruction of the building:

"With great care [...] with due solicitude [...] Commander Brother Pierre Clouet; in 1489 the completely new Hospital was finished".

Diligent(er) [...] de levure sollicite(r) [...] enfermie F(rater) P(etrus) Clovet comand(eur) MCCCCLXXXVIII, compli fut hospital tout neve.

In his history of the Order of Knights Hospitallers of St. John, Bosio (1594), follows Guillaume Caoursin's account (*De terremotus*) almost to the letter. The only point where he provides information not in Caoursin's work, is when he states that the 1481 earthquakes were also felt in many parts of Asia Minor and what is now central Turkey, whereas Caoursin only mentions Asia in general terms. Bosio writes (p.350): "And not only at Rhodes, from time to time [...] these earthquakes caused great terror and fright when they were felt; but in almost all the islands of the archipelago and even on the mainland, in the provinces of Lycia, Caria, Lydia and Maeonia, in what is properly called Asia Minor; in Bithynia, Galatia and Paphlagonia".

E non solamente in Rodi, di quando in quando [...] con molto terrore e spavento degli abitanti, questi terremoti sentir si fecero; ma in quasi tutte l'isole dell'Arcipelago et anco in Terraferma, nelle provincie della Licia, della Caria, della Lidia, della Meonia, in quella che propriamente Asia Minore si chiama; nella Bitinia, nella Galatia e nella Paflogonia.

▲							
1481 05 03 6:30 UT							
localities	lat.	long.	I	localities	lat.	long.	I
Rhodes GR	36 26	28 13	V-VI Ts	Antalya TR	36 53	30 42	Ts
1481 10 03							
localities	lat.	long.	I				
Rhodes	36 26	28 13	V-VI				
1481 12 17 22:00 UT							
localities	lat.	long.	I				
Rhodes	36 26	28 13	IV-V				
1481 12 18 3:00 UT							
localities	lat.	long.	I				
Rhodes	36 26	28 13	V-VI				
1481 12 18 5:15 UT							
localities	lat.	long.	I				
Rhodes	36 26	28 13	VIII-IX				
1481 12 19 5:15 UT							
localities	lat.	long.	I				
Rhodes	36 26	28 13	IV-V				

(365) 1481 November 21 - 1482 November 20 [931 A. e.] Erznka
[eastern Turkey]

- sources 1 *Chron. min. Arm.*, I.11, p.169; colophon in Hakobyan (1956, p.286, no.13); verse composition by "Zacchaeus the Elder" [probably Zeki Erec', in Conybeare (1913, p.284)]
- sources 2 *Notula*, in *Chron. min. Arm.*, I.27, p.392, no.5; *Chron. min. Arm.*, II.12, pp.34-5; *Ar. Tabr. Book*, p.473
- historiography Incicean (1822); Abich (1882); Kostaneanc' (1902); Zeyt'unyan (1991)
- catalogue d. Step'anyan (1964)
- catalogue p. Ergin *et al.* (1967)

In the year 931 of the Armenian era (21 November 1481 - 20 November 1482), there was a destructive earthquake at Ezenka (present-day Erzincan) and the surrounding area (in present-day Turkey). According to the sources almost all the buildings in Erzincan collapsed and there were a great many victims: the number given varies from 18,000 to 32,000 in the different texts. There is evidence for this destructive event in a source known as the *Anonymous of Sivas* (*Chron. min. Arm.*, I.11) in a context relating to the year 931:

"In the same year an earthquake struck Eznka and 32,000 souls were buried there".

ի սոյն ամի ժամ ելաւ յեզնկան ԼԲՈ հոգի մնաց ներքև հողին.

The same information is reported by Arakel of Tabriz. Another text, written by a contemporary (Yerevan manuscript, no. 6879, fol.276r., in Hakobyan 1956, p.286, no.13), reports:

"And so it was written in the bitter and difficult years, that for the sins into which we fell the city of Erzenka was destroyed with 18,000 souls inside it. Nobody was left alive".

Եւ արդ գրեցաւ սա ի դառն և ի նեղ ժամանակիս, զի վասն ճովացեալ մեղաց իմոց երզնրնկա քառար տապալկեցաւ և ժԸՌ ոգի ի ներքն հողոյ: մնաց և այլ ոչ մի կենդանի.

Armenian manuscript no.110, written in the 17th-18th century and now in the British Museum, contains a collection of poetry in Conybeare (1913, p.284). There is a reference to this earthquake:

"The poem of Zak'i iric' [erec' = a rank in the religious hierarchy: "elder"] on the earthquake at Ezenka. When the year 931 of the Armenians [21 November 1481 - 20 November 1482] had ended, an astonishing thing happened in the capital Ezenka. / Suddenly they saw death, faced the punishment, were like the Sodomites, were imprisoned in the earth / When the city collapsed to the ground, and great and small were caught in the shaking, so that a great cry of dismay from our thousand mouths could not do justice to it / The orders were seated behind the prince, and with great quantities of property [?], and together with the monks, they were buried under the earth / And after fifteen days had passed, they found [?] ... Weeping [(s)he?] went towards the market [?] mother [?]. / Zak'i eric', you sweet singer and unworthy sinner, you did something which cannot be denied, repent, p'oleman [?] / The whole city was destroyed. They were buried, the whole region was reduced to ruins, and neither Armenian nor Muslim survived".

Տաղ վ(ա)ս(ն) եզրնկուն շարժմելուն զաքի իրիցու է. Յինքն հարիցք չայոց թվական ԼԸ. Թիւն ի լման, զարմանալի բան մի եղան, մայրաքաղաքն ի յեզրնկան: / Յանկարծակի մահու դիպան, պատուհասի հանտիպեցան, սողոմացոց նրման եղան, ներքև հողուն զընտանեցան: / Յորժան քաղաքն ի դունթ ելան, ու մանր ու մեծն ի դողելան, եթէ վայ մեզ. ո. բերան մեք չի հասար ի պատուիրան / Դասք մի նստեր էր զեւ իշխան, հազար բարով իւրեանց խաւնչան, քահանայի քրն միարան, ներքև հողում զընտանեցան / ... Ժե աբն ի լման, տապ գբւան զանմէկ

տրշան լալով կերթար դէպ ՚ի շուկան, քիմ լարնու մայրն ամ ինչ Եղան/Ձաքի եղևց
 անուշ բանքցի, մեղաւք ելի և անարժան, անհերիքլ զինչ գործեցիր, դարձիր եղիր
 դու փոլեման/հոյոր քաղաքն աւիրեցան. ներքև հողուն զքնտանեցան, շայուք եղև
 բոլոր աշխարհն, ոչ հայ մընաց ոչ մրսրման.

▲ 1481 11 21 – 1482 11 20 [931 A. e.]
 localities lat. long. I
 Erzincan 39 44 39 30 X

< 366 > 1482 February Ragusa [southern Croatia]

< 367 > 1482 September 26 Ragusa

sources 2 Razzi (1595, p.64)
 literature Albini (2004)
 catalogs d. von Hoff (1840); Perrey (1850);
 catalogue p. Shebalin *et al.* (1974)

In February 1482, the town of Ragusa (present-day Dubrovnik) and the surrounding area was struck by strong earthquakes. On 26 September in the same year, there were more shocks. A year earlier, on 14 February 1481, the town had been struck by another strong earthquake (see the entry concerned).

Information about this earthquake is recorded in a history of the town of Ragusa by the Dominican theologian Serafino Razzi (1531-1611):

“In the year 1482, in the month of February, there were again some very strong earthquakes at Ragusa and all round about. And in addition to this there was hail. On 26 September, there were more earthquakes”.

L'anno 1482 del mese di Febraio, vennero di nuovo grandissimi terremuoti à Raugia, e per tutto il contorno. Ai quali ancora s'aggiunse la grandine. Alli 26 di Settembre di nuovo furono terremuoti.

▲ 1482 02 –
 localities lat. long. I
 Dubrovnik 42 40 18 07 V-VI

1482 09 26
 localities lat. long. I
 Dubrovnik 42 40 18 07 F

< 368 > 1483 June 14-15 Cairo [Egypt]

sources al-Suyuti, *Kashf*, p.58; Ibn Iyas, *Bada'i*, III, p.201
 catalogue d. *Ambraseys *et al.* (1994)

During the night of 15 June 1483, there was an earthquake at Cairo. According to the sources, it would have caused serious damage if it had lasted longer.

Information about this earthquake is recorded by two contemporary Arab historians, al-Suyuti and Ibn Iyas. Al-Suyuti gives the exact day of the earthquake, but does not

say where it occurred: "In the year [8]88 [of the Hegira], during the night of Sunday 9 *Jumada* I [15 June 1483] there was a slight earthquake".

و في سنة ثمان و ثمانين في ليلة الاحد تاسع جمادى الاولى حصلت زلزلة لطيفة.

Ibn Iyas puts the date of the earthquake back to the previous month, but does not give the day:

"In that month [*Rabi' II* = 9 May – 6 June], there was an earthquake at new Cairo after the late evening, but it was slight and short-lived, but if it had lasted for the duration of a *daraja*, serious damage would have resulted".

و فيه وقعت زلزلة بالقاهرة بعض العشاء، لكنها كانت خفيفة و لم تدم، و لو دامت قدر درجة حصل منها غاية الفساد.

In spite of slight discrepancies in their chronology, al-Suyuti and Ibn Iyas agree in suggesting that the earthquake occurred in the late evening or at night, and so we think they are both referring to the same event. The sources do not agree about the date, however, since Ibn Iyas places it a month earlier than Suyuti; and the latter does not tell us where the earthquake occurred. For the term *daraja*, see our remarks in connection with the earthquake of October-November 1476.

Ambraseys *et al.* (1994, p.102) give it an epicentral intensity of class F, which is equivalent in their classification to a range from felt to strong (up to grade VI MSK).

▲ 1483 06 14-15 at night

localities	lat.	long.	I
Cairo	30 03	31 15	IV

< 369 > 1483 August 11 Romagna [northern Italy]

sources 1 [manuscript] BClassenseRa, cod.490, fol.331r., no.976, Giovanni Mocenigo (doge of Venezia), Order, 9 March 1485; BCSaffiForli, *Rac. Pianc.*, O.IV.18, *Cron. Albertina*, fols. 502, 536-7; BRiccMor, Florence, *Moreniani*, 277, *Priorista*;
Letter from Antonio Trono (controller of Salt), 16 June 1488, in *Monum. Raven.*, ed. Fantuzzi 1801-04, IV, p.499; Cobelli, *Cron.*, p. 281; Bernardi, *Cron.*, pp.118-9; Fantaguzzi, "Caos", pp.17-18, 19, 22; Zambotti, *Diario*, p.144; Sanudo, *Vitae*, col.1229

sources 2 BCSaffiForli, *Rac. Pianc.*, VII/84, *Parti, Mem.*; BCMalatestianaCesena, *Mss.*, 64.23, *Parti, Mem.*

historiography Marchesi (1678); Burriel (1795); Rosetti (1894); Conti (1979); Mengozzi (1979)

catalogues d. Guarini (1880); Mercalli (1883); Baratta (1901); Milne (1911); *Boschi *et al.* (1997, 2000)

catalogues p. Giorgetti and Iaccarino (1971); Carrozzo *et al.* (1973); Postpischl (1985); CPTI (1999)

On 11 August 1483, at about 19:40 UT (the first hour of the night, "Italian time"), an earthquake struck the sub-Apennine region and the plain of Romagna, causing serious damage in the area between Cervia (present-day Cervia Vecchia, about 2 km south west of the modern town), Forli and Cesena.

At the ancient town of Cervia, most houses either collapsed or were very badly damaged (1/2 – 2/3, depending on the source), and there were victims (some or many, depending on the source). The medieval part of the town was in the middle of the salt-works area. The town was later on gradually abandoned because unhealthy conditions led to the site becoming malarial. At the end of the 17th century, work began on building a new settlement about 2 km north east of the old one.

Some houses collapsed at Cesena, and others suffered cracks and fallen chimneys. The church of S.Domenico was badly damaged, as was also that of S.Maria dei Servi (now the Sanctuary of the Addolorata), with the result that it collapsed shortly afterwards.

In the convent of S.Francesco, the vaulted roof of the library (now Biblioteca Malatestiana) split open, the dormitory cornice fell down, and the bell-tower was badly damaged. The piers in the cathedral were also badly damaged. In the main square, the battlements of the old town hall collapsed and the great tower of "fra' Borello" was so badly damaged that it had to be demolished. The Palazzo dei Conservatori (now the Palazzo del Ridotto) was very seriously damaged and had to be completely rebuilt. One person was killed (and one injured) in the town, and there were many victims in the surrounding countryside.

Almost all the houses in Forlì suffered cracks and fallen battlements and chimneys. One house in the S.Tommaso district completely collapsed, as did a tower-house in the S.Croce district. Two turrets fell from the bell-chamber of the bell-tower of S.Mercuriale, and the spire split open and had to be secured with chains. The top part of the bell-tower of S.Croce (the cathedral) collapsed, as did parts of the bell-tower of S.Agostino. At the convent of S.Francesco, the west wing of the cloister, where work was being carried out, also collapsed. One person was killed in the town, and 7 were injured in the Villa di Fabbrica district. There was substantial damage at Ravenna, especially to older buildings. At Rimini, various houses were damaged and some chimneys collapsed. There were some victims. There was also serious damage at some small towns, such as Bertinoro (20 dead and injured), Casemurate (5 dead), and Roversano (4 dead); and we are told that numerous buildings collapsed there. The roof of the abbey of Santa Maria delle Grazie di Fornò was also badly damaged. The shock was strongly felt at Ferrara, and less severely at Venice, Bologna, Florence and Ancona.

Since the period of seismic activity lasted as long as about three months, the people of Cesena were obliged to take refuge in the countryside and sleep in the open.

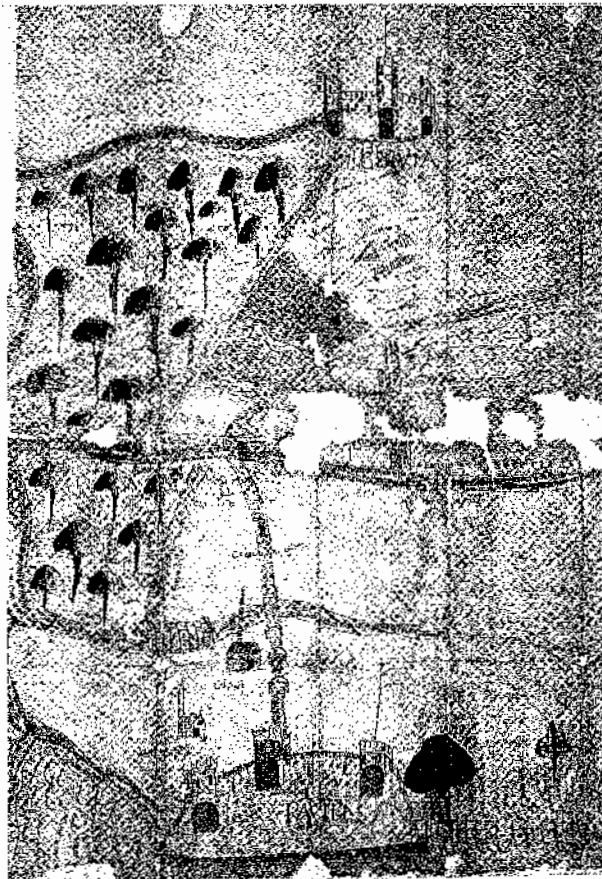


fig. 141 Cervia, Classe and Ravenna on a 15th c. map, showing the characteristic environmental qualities of the area. At that time there were vast areas of marshland, described here as "dark water" (*aqua foscha*), salt-pans, and the famous pine-wood planted around the year 1000 (Archivio Storico Comunale, Ravenna, map no.587).

Conti (1979) has documented damage and restoration work at the principal buildings in the town of Cesena. There was particularly serious damage to the Palazzo dei Conservatori, the construction of which had been started in 1468 and completed only a few years before the earthquake. Its wall structures failed to withstand the impact of the shocks, and collapses were so substantial that the town council was obliged to decide, on 2 September 1483, that it should be completely rebuilt. All the townspeople contributed to the work of rebuilding, including those from the *contado*, who were given the task of supplying lime and other materials. The work was completed in 1499. Various pieces of restoration work were carried out between 1486 and 1491 in the town hall and the adjacent Palazzo del Governatore. Serious damage was suffered by the *Casa delle gabelle* (or *Casa delle bollette*), which stood in the main square and was already unstable. It was completely demolished in 1486 and subsequently rebuilt.

Historical sources

In the closing decades of the 15th century, Romagna was coming once again within the orbit of papal power, after being subject to various city lordships: Cervia and Ravenna had been under Venetian domination since 1441 and remained so until 1509. Cesena became part of the Papal States again after the *signoria* of Domenico, the last of the Malatestas (1432-1465). Forlì had been obliged to accept Girolamo Riario as papal vicar when the rule of the Ordelaffi family came to an end in 1480. When the earthquake occurred, therefore, there were a number of different powers within this fairly restricted area.

The earliest sources are two administrative documents dating to 1485 and 1488, and various chronicles written in the late 15th and early 16th century in central and northern Italy. The first document is dated 9 March 1485: the doge of Venice, Giovanni Mocenigo, grants to the townspeople of Cervia the right to use all necessary materials to be found in the territory of Ravenna for repairing damage caused by the earthquake of 1483:

"Giovanni Mocenigo by the grace of God Doge of Venice [...] We have decided to grant to our good Christian people of Cervia, who have urgently and humbly petitioned us, the right to extract or have extracted stone, lime and timber for essential repairs and restoration work relating to damage caused there by the earthquakes which shook that town during this last year [...] Given on this 9th day of March in the 3rd indiction, 1485".

Joannis Mocenigo Dei gratia Dux Venetiarum [...] Concessimus cum nostro consilio Deum fideli comunitati nostre Cerviae ita multa instantia et reverentia supplicanti quod pro necessaria reparatione restaurationeque ruinarum in loco eodem secularum ex terremotibus qui hoc superiore anno vexarunt terram illorum possit ex territorio nostro Ravennae extrahere sive extrahi facere lapides calcem lignamina [...] Datum [...] die nono martij Indictione III 1485.

The second document is a letter sent on 16 June 1488 by an envoy of the Republic of Venice. He notes that on that date the town is still largely in ruins (in *Monumenti Ravennati*, ed. Fantuzzi 1801-1804, vol.4, p.499):

"The year 1488. 16 June. To the magnificent and generous D.Marco Barbo, *podestà* of Ravenna. I found the town of Cervia in so bad a state that it might just as well be called a ruin as a town, and in accordance with the orders given by our illustrious *signoria*, which has decided with the approval of the whole College to make this town a place of passage, I established where to place the gate, which will be of no small advantage to the town, and if this is to be put into effect as soon as possible, stone, lime, wood etc. are needed. Antonio Trono, Controller of Salt".

Anno 1488. Junio 16. Magnifico, et generoso D.Marco Barbo Potestati Ravennae.

Avendo io trovato questo luogo de Cervia mal condizionato, e più presto potersi chiamar ruina, che Terra, exequendo il Ducal mandati de la nostra Ill.ma Signoria, la qual ha deliberato con tutto el Collegio de fare questa Terra de passo io ho designato il luogo dove se abbia a far la porta, che non sarà piccolo beneficio a questa terra, e volendo questo abbia quanto prima effetto e aver piere, Calcina, etc. Legnami etc. Antonius Thronus Provisor Salis.

The two most reliable and detailed sources for this earthquake are the account by Andrea Bernardi (known as Novacula), who wrote his chronicle of the town of Forlì at the beginning of the 16th century, and that of Giuliano Fantaguzzi of Cesena (early 16th century). After recording a great drought, Andrea Bernardi goes on:

"[...] the earthquake occurred [...] on the 11th day of the month of August [1483], a Monday, at the first hour of the night. It was so great and powerful that there is scarcely any living person in our Province of Lombardy or in Romagna who has experienced a greater. It meant that tremendous and amazing things happened at certain places in these provinces, such as Rimini, where some houses and chimneys collapsed. And there were victims there, too. Many houses collapsed at Cesena as well, and many males and females died there, children and adults. Bertinoro, too, suffered a great deal. Much of it was in fact razed to the ground; and in one house where about 24 people were living, about twenty children and adults were killed or injured, not to mention all the others who died in the town in the earthquake, and the serious damage to buildings. Let us now leave these places and go to Cervia, which suffered a great deal, for I have been told that if Bertinoro suffered, Cervia suffered even more: almost two thirds of it collapsed, and many people died and their property was seriously damaged. The earthquake also struck Ravenna: many old buildings collapsed, and especially churches with their mosaics. Ferrara was also slightly affected, as was my city of Bologna, and indeed almost all of Romagna. That is what I have been told about these towns and villages.

Now I wish to go on to speak of our town of Forlì, for I was there when these things happened. First of all, it [the earthquake] was so powerful that it caused all the bells to ring in the bell-tower of our S.Mercuriale, and all the villages round about heard them. Likewise, two of the turrets fell from the bell-tower, and its steeple split open right up to the top: the abbot was obliged to have it chained. Similarly, the top of the bell-tower of S.Croce collapsed. Similarly, the turrets fell down from the bell-tower of S.Agostino. And similarly many churches in the *contado* came crashing down; and there was scarcely a house in Forlì that did not suffer some damage, and it would be very difficult to count those that did; but I can confirm what happened to some of them. In the first place, the Mulino dell'Orso which stood in the Casamurata district, collapsed, although it was entirely built with lime mortar and had vaulted [ceilings]; and it killed the miller there, called Giovanni di Molde da San Martino and his wife, who was in childbed, and four other people. Similarly, a house at Villa di Fabbrica belonging to a family from Muruxe. The head of the family was called Giacomo di Garzone. The house had only recently been built, and its whole roof collapsed. The earthquake struck when the whole family was at table. None of them was killed but seven were injured, though they recovered in a short time. Similarly, a house in the San Tommaso district of Forlì collapsed. It belonged to a man named Bartolomeo, son of Piero Madalena, a furrier; and the disaster which struck that house killed Bartolomeo's wife, who was called Cilia, daughter of Cristofano son of Giovanni Lunghe who was a blacksmith. Similarly, a large part of Giacomo Ravaiolo's tower, in the Santa Croce district, collapsed. Similarly, the west side of the cloister of the church of S.Francesco, where work was being carried out, collapsed. [...] This was the side of the cloister looking towards Faenza. All these extraordinary things happened in our town because of these earthquakes [...], and I witnessed them all".

*omnis excogitatio dei gratia dux videtur: a et nobilibus et sapientibus
 viris bonis villares de suo maritimo portu et Capitano R. et fieri
 suis fidelibus salutaris salutem a dilectis infirmis (infirmis)
 cum nro consilio deum fidei committimus nri curis in magna
 infirmitate et languore. Supplicamus quoque pro necessaria reparanda
 restaurandaque summa in loco eodem (infirmis) et infirmis
 qui pro infirmitate nra rogantur et committimus fieri posse*

fig. 142 Document dated 9 March 1485. Doge Giovanni Mocenigo grants to the townspeople of Cervia, which was at that time a dependency of Venice, the right to use building materials to repair the severe damage caused by the earthquake of 1483 (Biblioteca Classense, Ravenna, cod.490, fol.331r., no.976). Transcription and translation are on p.792.

[...] acadé li taramote [...] che fu a dì XI dal mese d'agoste, die luni; e fu in la prima hora dela note. E li fu tante grande e forte che quase per zente viva in questa nostra provencia di Lombardia et eciam de Romagna non fu mai vedute al mazore; con ciò fuse cosa che in certe terre de dite provencie acadé gram novità, come fui ala cità de Rimine, perché cadé alquante case e camine. E li acadé la morte d'alcune. Aprese a Cesena caschò li molte case; e li intravene la morte de multe homine e done, cioève piccole e grande. Aprese vignema a Bertenore al quale fu molte male tratate; con ciò fuse cosa che l'andò una gram parte per tera, per mode che ce fu tale casa che al s'abitava cercha 24 persone innentre; per mode che ie ne fu tra li morte e li ferite cercha 20 di lore tra piccole e grande, senza quile altre perticolaremente che morì in dito loghe per tale fortuna, senza al danne grande deli soi edeficio. Lasama mo al dite castelle et andema mo a Cervia la quale fu molte male tratata, perché, seconde che a mi fu reporte, Bertenore steva male e lei steva male e pegio; perché li dui terce quase andò per tera, e li ie morì molte persone come gram dane in le lore facultà. Ancora pure non zovò a Ravena: caschò li multe de quile edificio antigo e masime de quile ghiesie lavorate a mosaicha. Ancora pure tocò alquante a Feraria et ala mia cità de Bologna; e quase per tuta la Romagna. E queste fu tante quante a mi fu reporte de dite tere e castelle.

Fate tute le predite cose, io voie mo parlare dela nostra cità de Forlì dela quale io fu' prexente a tute lo sove predite cose. In prima fu tante grande che sondò tute li canpane del campanile del nostre sante Mercuriale, che tuta la tera le i odi. Item ancora caschò dui deli torisine dal dito campanile e li s'averse la dita sova pigna dal'une cante e l'altre per fine ala cima: fu forcia al dito M. l'abati a farelo inchiare. Item ancora caschò al penelo di quele di santa Croxe. Item ancora cadé li torexine de quele dila ghiesia di sante Agostine. Item ancora cadé e fracasose molte ghiesie di contade; e quase non fu casa dentre da Forlì che non n'avese qualche nocimente et seria molte deficile a contare; mo pure d'alcuna particolaremente ve ne farò fede. In prima caschò al Molino del'Orse che era ala sova posesione da Casamurata, al quale era tute murate a calzina ed era in volta; e li amazò al molinare come cercha 4 persone, al quale aveva nome Zohane de Molde da sam Martino insieme come la sova dona ch'era in lete di parte. Item ancora caschò una casa in la Vila de Fabrica la quale era de una famia di Muruxe; al cape dela dita famia si chiamava Jacome di Garzone; la quale casa si era fata tute di nove, per mode che al caschò tute al coverte. E dita famia era tuta a tavola, per modo che nesuno di lore vene morte salve che sete di lore vene tute toche e ferite per mode che in breve tenpo lore fune deliberate. Item caschò una casa dentre da Forlì in la contrada di sam Tomaxe, ed era de uno che se chiamava M.o Bertolomio già de Piero Madalena pilzare;

e li come vosé la mala ventura per dita casa vene morte la moie dal dito Bertolomio che aveva nome M.a Cilia già fiola de M.o Cristovano di Zohane Lunghe che era magnane. Item ancora caschò uno gram peze dela tore de Jacome Ravaiole, contrata Sante Crucis. Item ancora caschò una quadra del'inchiostre dela ghiesia di sam Francescho che era volta di nove e tutavia se ie lavorava; [...] E fu la quadra de dito inchiostre di verso Faienza. Si che queste fu tute li novità che per la virtù deli dite taramote acadé ala dita nostra città [...], che a tute fui prexente.

Fantaguzzi (pp.17-8) records the earthquake in the following terms:

"There was a tremendous earthquake in this year [1483] in Italy on 11 August. It was felt from Bologna to Florence and at Ancona, while at Cesena it lasted as long as it takes to recite the Lord's Prayer. It was very powerful and terrifying and caused great damage in many places, especially at Ravenna and Forlì. At Cervia it reduced the citadel and almost the whole town to ruins, and at Cesena it stunned everybody, for it caused the collapse of some houses, and broke or damaged all the chimneys, and it was a great miracle that the only person it killed was an excommunicated priest, and it crippled Ranero di Maschi; and it caused the collapse of many houses and killed many people in the *contado*. At Reversano [now Rovarsano] it reduced the *palazzo* to ruins and killed the vicar, Foschino Zamarino. At Cesena it damaged the whole recently painted church of S.Domenico, producing a number of cracks, and S.Maria dei Servi suffered similar effects and collapsed in ruins shortly afterwards. The earthquake hurled to the ground the battlements of the *palazzo* in the main square and those of the Palazzo dei Conservatori, and it split open the vaulted roof of the library of S.Francesco. It caused the collapse of the dormitory cornice, and split open the bell-tower. All the piers in the cathedral were damaged; and almost all the wells in Cesena were left without water and the springs dried up.

This earthquake lasted about 3 months with repeated shocks, so that all the population slept in the open, in the squares, convents and gardens, and some outside the town; and the same thing happened at Forlì. The earthquake killed Franzaschiavo, putative father of Piero da Reversano, and two companions".

Uno teramoto grandissimo in questo anno venne in Italia adì 11 d'agosto, sentitosi da Bologna a Fiorenza et in Ancona; et a Cesena durò el dire de uno paternostro, tanto arduo e teribille e fe' danno grandissimo in molti luochi e massime a Ravenna, Forlì, et a Cervia ruinò la rocha e quasi tutta la città, et a Cesena fu stupendissimo che buttò a terra qualche case, ma roppe e guastò tutti li camini e fo uno gran miracollo che non amazò se non uno preto eschomunicato e strupìò miser Ranero di Maschi; e per lo contà caschò molte case et amazò molte persone; a Reversano buttò a tera el palazo e amazò el vicario ser Foschino Zamarino; conquasò tutto la ghiesia de san Domenico in Cesena pinta novamente e apersella in più luochi et similmente Santa Maria di Servi, per el che pocho doppo ruinò e caschò tutta et gettò a terra li merli del palazo d'im piazza et e li conservaturi, et aperse le volte de la libreria de santo Francesco e gettò via la cornise del dormitorio, aperse el campanillo, li pilastri del domo tutti sfessi e li pozi de Cesena quasi a tutti tolse l'acqua e smari le vene.

Durò questo teramoto circha 3 misi continuando spesso, e tutto el popullo dormiva al schoperto per le piazze, a li conventi, ai orti et asai di fora e similmente Forlì fece. El teramoto amazò m.o Franzaschiavo putativo patre de domino Piero da Reversano con 2 compagni.

The severity of the earthquake is confirmed by the fact that the chronicler refers to restoration work to buildings in the two following years (pp.19, 22):

"S.Maria dei Servi at Cesena was rebuilt in that year [1484], having suffered earthquake damage".

Santa Maria di Servi da Cesena in quest'anno fo reedificata: gasta da teramoti.

"[1485] in the main square at Cesena the great tower of fra' Borello was demolished and razed to the ground, having been split open in the earthquake".

[1485] *Una gran torre sfessa dal taramoto in Cesena del fra borello in piazza fo zetata e spianata a terra.*

There is also a record of serious damage at Forlì in the *Cronache forlivesi* of Leone Cobelli (15th century):

"In the same year [1483], in the month of August, the day before the feast of St. Chiara [11 August], a very powerful earthquake occurred in the evening, causing many houses to collapse at Forlì and in the *contado*. In Forlì, part of one house collapsed and killed a woman called Maddalena di Bartolomeo di Pietro; and a tower belonging to Giacomo Ravagliolo collapsed, as well as many chimneys and battlements. Count Girolamo fled at that time to the citadel and had a pavilion erected, the citadel having been built in that very same year. And these earthquakes lasted for several days".

Eodem milesimo, del mese d'agosto, la vegilia de sancta Chiara, la sera venne uno grandenissimo terremoto, per el quale molte case cadé dentro da Forlivo e fori in lo contà. In Forlivo cadè uno pecio de casa e amaciò una donna, Madalena; e cadè una torre de Iacomo Ravagliolo e molti camini e merli. El conte Gerolimo alhora fogni in la citatella, et illi fe' mettere un padiglione: la quale citatella era stata facta e cominciata quillo anno midesimo del dicto milesimo. E duroro li dicti trimoti parichi di.

In the manuscript *Cronaca Albertina*, which is a miscellany of chronicles from the 15th and 16th centuries (Biblioteca Comunale Saffi, Forlì, *Piancastelli*, O.IV.18), there is information about S. Maria delle Grazie di Fornò, which does not appear in other sources (fol.502):

"the church remained like this until 1483, when that great earthquake occurred and the vaulted roof split open, and the friars removed it: they had it taken down and covered the space with wood and tiles [...]"

Et stette così la chiesa [di S. Maria delle Grazie di Fornò] sino al 1483 quando trasse quel gran terremoto et la detta volta si aperse et li frati la tolsero giuso et fenta abbassare, et coprire di legname con li cuppi [...].

The same chronicle also records information about Forlì (fols.536-7) which is very similar to that provided by Bernardi. Marin Sanudo (a contemporary Venetian author), while mentioning that the shock was felt in Venice, concentrates his attention on the damage at the town of Cervia, which was governed by Venice at that time:

"On 11 August [1483], there was a tremendous earthquake at our town of Cervia in Romagna, such that half of it was reduced to ruins, and one of the main towers of the Citadel was split open, and some people were killed. And this earthquake was also felt at Ravenna, 25 miles from Cervia, as well as at Venice. But it was not so powerful there. So the *Pregadi* decided to restore the Citadel".

A dì 11 d'Agosto in Cervia Terra nostra di Romagna fu un terribilissimo tremuoto, adeo [tanto] che rovinò la metà della Terra, e fendette una Torre principal della Rocca, e morirono alcune persone. E anche il detto tremuoto fu sentito a Ravenna, miglia 25 di là, e a Venezia. Ma non fu sì grande. Onde fu preso in Pregadi di ristorare la Rocca.

The *Diario Ferrarese* of Bernardino Zambotti (early 16th century) tells us that the earthquake was felt at Ferrara:

"On 11 [August 1483], a Sunday, at the first hour of the night, there was an earthquake which lasted as long as it takes to recite the Lord's Prayer. It was so strong that the clock bell sounded twice. We understand that some houses at Forlì collapsed in the earthquake".

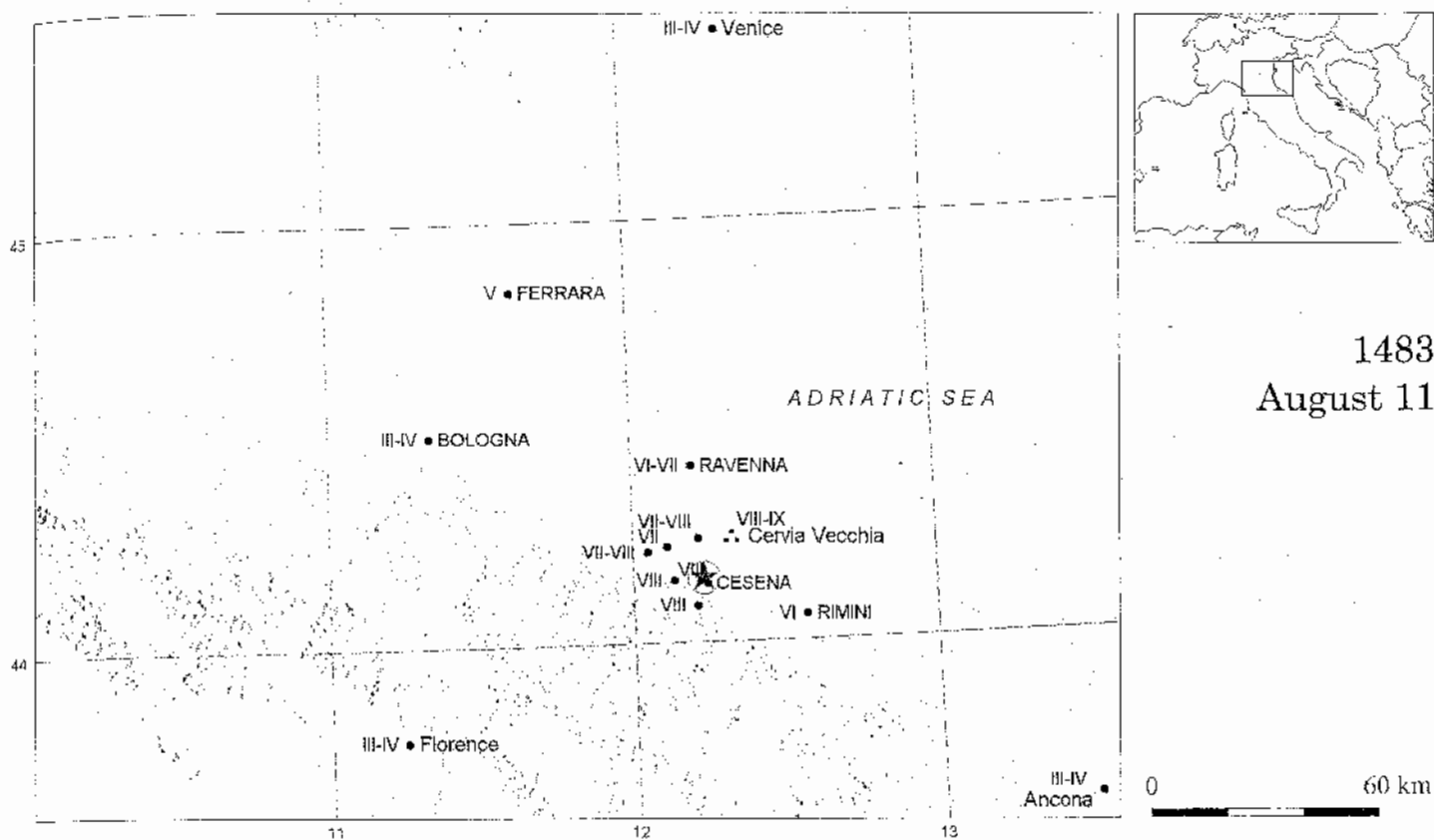


fig. 143

A dì 11, la domenega, ad una ora de nocte. Trette uno terramoto, che durò per il dire de uno paternostro, tanto forte che la campana de l'arlogio sonò dui botti; per il quale tremoto se hà intexo essere ruinate alcune case dentro Forlì.

Both Zambotti and Fantaguzzi are in agreement as to the duration of the earthquake, which can be estimated at 12-13 seconds.

The manuscript of the anonymous *Priorista storico di Firenze* (Biblioteca Riccardiana e Moreniana, Florence, 277) reports the occurrence of an earthquake in Romagna without giving any further details.

The narratives of Andrea Bernardi of Forlì and Giuliano Fantaguzzi of Cesena provide not only details of damage in their respective towns and the surrounding area, but also information which helps us to put together an overall picture of the event, for they tell us about earthquake effects in towns about which local sources are silent. For example, both say that the earthquake was felt at Bologna, whereas neither the contemporary chronicle of Borselli (late 15th century) nor that of Ghirardacci, compiled in the first half of the 16th century, record the earthquake, which was probably a minor event and hence failed to attract the attention of chroniclers.

In the 17th and 18th centuries, reports of the earthquake were included by continuers of the above works: by Marchesi (1678) and Burriel (1795), by Verdoni, Bucci and Pulazzini — all chroniclers from Cesena whose works are preserved in manuscript (Biblioteca Comunale Malatestiana, Cesena, 164.47, 164.37, 164.46, 164.14), and by Petriagnani, a chronicler from Forlì (Biblioteca Comunale Saffi, Forlì, II/24).

More recent local historiography (Rosetti 1894; Mengozzi 1979) has simply used information from contemporary chronicles. One exception is a study by Conti (1979), in which an analysis of public authority documents throws light on certain aspects of reconstruction and restoration work carried out on public buildings in Cesena.

▲ 1483 08 11 19:40 UT ☼ = 44 09 12 14 I₀ = VIII Me = 5.8 Sites: 14

localities	lat.	long.	I	localities	lat.	long.	I
Cervia Vecchia	44 15	12 20	VIII-IX	Ravenna	44 25	12 12	VI-VII
Bertinoro	44 09	12 08	VIII	Rimini	44 04	12 34	VI
Cesena	44 08	12 15	VIII	Ferrara	44 50	11 37	V
Roversano	44 05	12 12	VIII	Ancona	43 36	13 30	III-IV
Casemuratic	44 15	12 13	VII-VIII	Bologna	44 30	11 20	III-IV
Forlì	44 13	12 03	VII-VIII	Florence	43 47	11 15	III-IV
Santa Maria d.Grazie	44 14	12 07	VII	Venice	45 26	12 20	III-IV

< 370 > 1484 March 29 - April 28 [Rabi' I 889 H.] Aleppo [northern Syria]

source al-Suyuti, *Kashf*, p.59

literature Taher (1979)

catalogues p. Poirier and Taher (1980); al-Hakeem (1988)

A sequence of six shocks struck Aleppo between 29 March and 28 April 1484, causing panic amongst the local people; but we are not told of any damage.

Information about this earthquake can be found in al-Suyuti, contemporary historian: "In the year [8]89, in the month of *Rabi' I*, the earth shook at Aleppo six times or more, giving rise to panic".

وفي سنة تسع وثمانين زلزلت حلب في ربيع الأول ست مرات أو أكثر زلزلة شديدة مهولة.

Poirier and Taher (1980, p.2193) and al-Hakeem (1988, p.22, no.224) give this event an intensity of grade VII MM, but the source which describes it simply records that it caused panic, without mentioning any damage.

▲ 1484 03 29 - 04 28 [Rabi' I 889 H.] 6 shocks

localities	lat.	long.	I
Aleppo	36 14	37 10	V

< 371 > 1487 January 11 Ferrara [northern Italy]

sources 1 Zambotti, *Diario*, p.178; Rizzoni, *Mem.*, p.228

sources 2 BCariosteaFe, *Mss.*, cl.I., 645 Rodi, *Ann.*, 2, fol.435

historiography Moscardo (1668); Biancolini (1749); Sormani Moretti (1904)

catalogues d. Goiran (1880); Baratta (1901); Milne (1911); Bettoni (1908); *Boschi *et al.* (1995, 1997, 2000)

catalogues p. Giorgetti and Iaccarino (1971); Carozzo *et al.* (1973); Postpischl (1985)

On 11 January 1487, at 12:40 UT (the twentieth hour, "Italian time") an earthquake, which lasted for about 7-8 seconds, caused great panic amongst the inhabitants of Ferrara; but there are no reports of damage. The shock was also felt at Verona.

The sources are 15th and 16th century memoirs, that is to say those of chroniclers Bernardo Zambotti for Ferrara and Giacomo Rizzoni for Verona. Zambotti experienced the earthquake himself, and describes it in lively terms: "Thursday, 11 [January 1487]. A great earthquake struck at about the 20th hour and lasted as long as it takes to recite a whole Hail Mary, and all the buildings and the earth trembled, and everybody ran through the square not knowing where to go, so great was their fear".

A dì 11, la zobia. Trette uno taramoto grande circha a hore 20, e durò tanto quanto

staria uno a dire tuta una avemaria, e tuti li edifici e la terra tremava e ogn'omo correva per la Piazza, né sapeano dove, de gran paura.

In 1487, 11 January was indeed a Thursday. Zambotti's evidence is the source for the manuscript *Annali di Ferrara* by Filippo Rodi (16th c.). In Rizzoni's 16th century chronicle, it is reported that the shock was felt at Verona, but the time given is different from that in Zambotti:

"In the year 1487, on 11 January at about the 23rd hour there was an earthquake".

L'anno 1487 adi 11 Zenar circa hore 23 trasse il terremoto.

Moscardo (1668) and after him Biancolini (1749), suggest that its effects were more serious, since they add that many houses collapsed. This suggestion was passed on through Goiran (1880) as far as the modern seismic catalogues of Baratta (1901) and Bettoni (1908).

In order to improve our state of knowledge, we carried out a thorough archive investigation, but without result. We also examined the documentary sources in the Archivio di Stampa at Verona, Vicenza, Venice, Padua and Milan (Sforzesco papers concerning the cities of Mantua, Venice, Padua, Lodi, Milan and Como).

The fact that this earthquake is reported only sporadically in the local historiographical tradition, and that other Veneto and Lombard sources are silent on the matter, suggests that the earthquake's effects were confined to Verona and Ferrara, and that no damage was caused.

▲ 1487 01 11 12:40 UT

localities	lat.	long.	I	localities	lat.	long.	I
Ferrara	44 50	11 37	V	Verona	45 26	11 00	F

{ 372 } 1489 or 1490 Constantinople [north-western Turkey]

sources 1 ASMo, *Cancellaria Ducale*. Carteggio Principi Esteri, b.1245/1, Ferrante of Aragon, Letter, 13 August 1490

sources 2 Calvisius, *Opus, ad annum 1489*

historiography Figliuolo (2002)

catalogues d. Bonito (1691); Ambrascys and Finkel (1991)

catalogue p. Shebalin *et al.* (1974)

In 1489 or 1490 (the date of the event is uncertain) an earthquake caused "very great damage" at Constantinople. This information is provided by a reliable source cited in Figliuolo (2002, pp.891-2), namely an autograph letter from Ferrante of Aragon, king of Naples, to his daughter Eleonora, duchess of Ferrara. The letter was sent from Naples on 13 August 1490 — a date which provides us with a *terminus ante quem* for the earthquake — and is now in the Archivio di Stato at Modena (*Cancellaria Ducale*. *Carteggio Principi Esteri*, b.1245/1).

The very terse but valuable reference to the earthquake is as follows: "There is a terri-

In constantinopoli e grandissima peste el terremoto ha fatto gran danno e feline
 ha anco grandissima moritione dal turcho feruata in vna citta chiamata santhans
 La noua spo turcho era passato peronalte in statoha glo feruato dila parte mo

fig. 144 Passage from the letter sent by Ferrante of Aragon to his daughter Eleonora on 13 August 1490, in which he tells of the earthquake at Constantinople in 1489 or 1490 (Archivio di Stato, Modena, *Cancellaria Ducale*. *Carteggio Principi Esteri*, b.1245/1).

ble plague at Constantinople and an earthquake has done great damage [...]"

In Costantinopoli è grandissima peste, el terremoto ha fatto grandissimo danno [...].

The letter goes on to tell of a fire caused by lightning. There is probably another reference to this earthquake — though it is dated to 1489 — in the *Opus chronologicum* of Sethus Calvisius (Seth Kalwitz, 1556-1615). He, too, refers to a fire.

Within the seismological tradition, this earthquake is dated by Bonito (1691) to 1489 or 1490. According to Ambraseys and Finkel (1991, p.537), the earthquake struck on 16 January 1489 and caused a number of minarets to collapse.

▲ 1489 or 1490

localities	lat.	long.	I
Istanbul	41 02	28 57	VII-VIII?

< 373 > 1491 January 24 Padua [northern Italy]

- sources 1 [manuscripts] ASPd, *Archivio antico Com.*, Atti, reg.10, fol.310, 30 January 1491, fol.327v, 9 July 1491, fol.328, 24 July 1491; reg.11, fol.22v, 17 May 1492; *Archivi not.*, Atti, reg.760, fol.354, 25 January 1491, reg.761, fol.394, 9 June 1494, reg.762, fol.133v, 16 June 1495, reg.3975, fol.423, 31 May 1494; *Corpor. relig.*, fols.111-3, 23 February 1492; ASVe, *Senato Terra*, reg.11, fol.53, 3 March 1491
- historiography Scardeone (1560); Portenari (1623); Moscardo (1668); Biancolini (1749); Gasparotto (1955, 1961); Brandolese (1975)
- literature Guidoboni *et al.* (1997)
- catalogues d. Bonito (1691); Goiran (1880); Baratta (1901); Iaccarino and Molin (1978); *Boschi *et al.* (1995, 1997, 2000)
- catalogues p. Carrozzo *et al.* (1973); Postpischl (1985); CPTI (1999)

Postpischl's catalogue (1985) lists an earthquake at the year 1492, but without indicating a month or day, classifying it as having an epicentral intensity of grade VIII MCS, and locating it at Pescantina (about a dozen km north west of Verona). According to Baratta (1901, p.82), who makes use of Goiran's catalogue (1880, p.19), this earthquake destroyed a large number of houses in Verona, and many victims perished in the ruins. Goiran obtained his information from two 17th and 18th century historians of Verona: Moscardo (1668) and Biancolini (1749, II, p.88), the latter being wrongly called Zagata by Goiran (and Baratta).

However, we have been unable to find any reports of this earthquake in contemporary documentary sources in the Archivio di Stato in Verona. An examination of the registers of ducal letters and letters to the *Provveditori (Antico archivio del Comune)* and of other collections in the same archives (*Atti dei Rettori; Congregazioni religiose sopresse: S.Bernardino, S.Maria in Organo, S.Maria della Scala*) produced no useful results. 16th and early 17th century Veronese historiography proved to be equally silent about this event. There consequently seems to be no justification for the attribution to Verona of an intensity of grade VIII on the MCS scale given in Boschi *et al.* (1995, 1997, 2000). The silence of contemporary Veronese sources and the danger of misunderstanding the Veneto calendar suggested that it would be worthwhile seeking further information in other contemporary sources from the Veneto area. In the Archivio di Stato of Padua and Venice we found reports of an earthquake affecting the city of Padua, and the results of our research are set out below.

On 24 January 1491 towards 23:50 UT (the seventh hour of the night, "Italian time"), there was an earthquake at Padua which badly damaged the church of S.Maria del Carmine. Collapses involved the whole roof, including arches and vaulting, and the

upper third of the side walls, as well as the roof of two chambers used as a dormitory, above the sacristy. The buildings nearest to the church were also badly damaged by masonry falling from above. Thus on the east side half the cloister was badly affected as well as a third of the new chapter house belonging to the *confratelli* of S.Maria del Carmine; while three dwellings were damaged on the west side, and also, to a lesser extent, the house of the *rettore* of the nearby church of S.Giacomo. There were two victims.

Documentary sources display a degree of uncertainty as to the basic cause of the collapse: one claims that it occurred because of "an earthquake or some other cause", and another attributes it to "a large quantity of snow or an earthquake".

The bull issued by pope Julius II on 23 March 1504, granting a plenary indulgence in order to increase contributions towards the slow work of rebuilding the church, specifies that the roof collapsed as a result of the building's age, but papal documents often omitted earthquake damage because it was considered a bad "sign". There must have been several contributory causes, involving the poor state of the building, exacerbated by an overloading of snow which weakened its timbers.

Contemporary chroniclers do not record this earthquake, or the collapse of the church. The first to provide a seismic interpretation of the causes of collapse at the Carmelite church was Gasparotto (1955, 1961). The study by Guidoboni *et al.* (1997) offers an analysis of the relevant documents, which has been used to provide an architectural interpretation of the present building.

Evidence for the collapse of the church is in any case to be found in numerous manuscript documents in the Archivio di Stato in Padua (in the Acts of the *Archivio antico del Comune*, in those of the *Archivio notarile*, and in the *Corporazioni religiose* collection), as well as in a document in the Archivio di Stato in Venice.

The most substantial information about the collapse of S.Maria del Carmine is to be found in the preamble to an inventory penned by Giovanni Codalunga, a notary, on 25 January 1491 (*Archivio notarile*, reg.760, fol.354). He drew it up *in situ* only a few hours after the event, amongst the snow-laden ruins, at the request and in the presence of the three noblemen responsible for the maintenance of the city's churches. But the document contains no reference to the direct cause of the collapse: "In the name of Our Lord Jesus Christ amen.

In the year 1491 since his birth, in the ninth indiction, on 25 January.

[...]. The church of S.Maria collapsed on Monday 24 of the month at the seventh hour of the night, that is to say on the eve of the feast of St.Paul. The whole roof collapsed, including the arches and vaulting, the upper third of the two side walls, the roof of the dormitory occupying two chambers above the sacristy, and also the sacristy itself. A certain brother Giacomo da Bologna died in the above ruins. The walls of this church caused the collapse of half the cloister and one third of the new chapter house of the venerable confraternity of S.Maria, and on the other side it reduced half to ruins three dwellings, and also damaged to a lesser extent the house of Don Nicolò, who was in charge of the church of S.Giacomo, and whom the superintendents rescued from beneath the great quantity of debris, beams, stones and snow which had descended upon the sacristy; and they also rescued the sacristan, brother Giacomo da Padova, who was swept away amongst the debris and suffered a head injury that night [...]."

In nomine Domini nostri Iesu Christi amen. Anno a nativitate eiusdem V quadringentesimo nonagesimo primo, indictione nona, die martis vigesimoquinto mensis ianuarii. [...] ecclesia S.Marie die lune XXIII dicti mensis circa septimam horam noctis videlicet in vigilia sancti Pauli corruit videlicet coopertura tota simul cum arcibus et voltis et sponde muri a duobus lateribus per tertiam partem et coopertura dormitorii per duas cameras que erant super sacristia et etiam sacristia et mortuus fuit in dicta ruina quidam frater Iacobus de Bononia mortuus in dicta, sacristia et muri dicte ecclesie corui

fecerunt medietatem claustrum et tertiam partem capituli noviter fabricati venerabilis fratres sancte Marie et ab alio latere corruerunt medietatem trium domorum et partim etiam domus venerabilis domini presbiteri Nicolai rectoris ecclesie sancti Iacobi qui domini provisores reperiiri fecerunt in maxima multitudine ruinatam et lignaminum et lapidum et nivis qui et que iacet in dicta sacristia et etiam dominus frater Iacobus de Padua seu propter dictam ruinam fuit totus colisus et fractum caput illa nocte [...].

On 30 January 1491 Padua city council made a decision to provide for the rebuilding of the church (*Archivio antico del Comune*, reg.10, fol.310). The document records that the collapse had been the result of an earthquake or other cause: "On 30 January [1491] [...]. the decision is as follows, that since the holy church of the monastery of S.Maria dei Carmelitani has been badly damaged either by an earthquake or by some other cause, so that not only the very broad roof but also a large part of the cloister have been destroyed, and the sacristy in its entirety, and the walls have been knocked down as we all know, and indeed the chapels and the porch are likely to collapse if they are not restored or supported [...]."

[1491] Die dominico XXX ianuarii [...] fuit pars infrascripti tenoris videlicet quantum edes sacre monasterii sancte Marie Carmelitarum seu terre motu seu alia ex causa maximam ruinam passe sunt, ut non solum tectum illud amplissimum, sed etiam claustrum magna pars sacristia totaliter dirupta sint et parietes conquassati ut notorium est quin imo etiam capelle ipse sive porticus in templo existentes ruinam minantur, nisi reficiantur vel suffulciantur [...].

In a decision reached on 3 March 1491 (*Senato Terra*, reg.11, 1491, fol.53), the Venetian Senate approved emergency measures for rebuilding the roof of S.Maria del Carmine. The text specifies that the collapse of the roof was caused by a large amount of snow and an earthquake: "1491, in the ninth indiction, on 3 March. To our ambassador on the mainland. This Council has learned by reading your petition that the church of the Carmelites of Padua, which was a most beautiful church and the third in importance in that city, has half collapsed at the top, including the roof, because of a great quantity of snow and an earthquake. The matter certainly deserves our compassion and concern. The poor Carmelites cannot restore their church without having recourse in part to seeking alms, because the normal income of that monastery is too slight and limited, and so the honourable ambassadors of our very faithful city of Padua have appeared before this Council. And with deference and vigour they have petitioned us to condescend to grant the said request.

MCCCCXCI, indictione IX die tercio intrante martij. Oratori nostro in Terra. Ex supplicatione vestre lecta hoc Consilius intellexit, quomodo ob multitudinem nivium et ob terremotus ecclesia Carmelitarum Padue que erat templum pulcherrimum et tertium ex ordine illius Civitatis, a medio sursus cum tecto corruit. Rem profecto dignam pietate et compatiendam. Et quum ob nimis tenues atque exiguos redditus, quos ordinarie percepit illud monasterium, impossibile est illis pauperibus religiosis restaurare templum eorum, nisi accedant oppitulatores elemosinas, comparuerit ad presentiam Dominij nostri spectabiles Oratores fidelissime civitatis nostre Padue. Qui devote et instantissime illi nomine supplicarunt, ut dignemur benigne exaudire dictam supplicationem lectam.

The document goes on to agree to remit 550 ducats of earlier taxes and to abolish the collection of tithes for the next ten years. The next document reports on restoration work at the church of S.Maria del Carmine, but without further indication of the reason why repairs were necessary.

In a proposal put to Padua city council on 9 July 1491 (*Archivio antico del Comune*, reg.10, fol.327v.), it was decided, partly for financial reasons, to use timber as the mate-

rial for repairs, since it was less expensive than bricks.

A petition lodged by Padua city council and dated 24 July 1491 seeks approval for the use of a lane adjoining the Carmelite monastery for purposes of restoration work at the church (*Archivio antico del Comune*, reg.10, fol.328). In a deed of transfer dated 23 February 1492, which deals with ways in which restoration work could be facilitated, the collapse of the previous year is mentioned (*Corporazioni religiose*, fols.111-3): "1492 in the tenth indiction, on Thursday 23 February [...] and in 1491 on the eve of the feast of the Conversion of St.Paul, during the night, the said church of S.Maria, that is to say the roof and part of the walls collapsed, to the extent that amongst other things a large part of the roof and the walls of the said chapter house and all the said cross vaulting of the said refectory split open and threatened to collapse, and would indeed have soon fallen, so that it was necessary to demolish them in order to avoid the danger, as is quite clear".

MCCCCLXXXII. Indict. decima. die Jovis 23 mensis februarij. [...] et de 1491 in vigilia convertionis Sancti Pauli, notis tempore dicte ecclesie Sancte Marie Virginis coperturam cum partes murorum corruit adeo quod ruinavit infra cetera magna parte coperture et murorum dicti Capituli et omnes dicte crosarie dicti refectorij sisse sunt et minabant ruinam ut in brevi corruissent et cis oportuit illas demoliri facere causa evitandi periculus, pro ut evidenter apparet.

On 17 May 1492, the deputies of the *Cose Sacre di Padova* petitioned their superiors in Venice for help in restoring the building and asked them to intercede with pope Innocent VIII in order to obtain a plenary indulgence (*Archivio antico del Comune*, reg.11, fol.22v.). This and the following documents are to be found in Guidoboni *et al.* (1997).

The work of reconstruction may have begun in 1494, when certain employment contracts with master masons and stonecutters were registered, as we find in a notarial deed dated 31 May 1494 (*Archivio notarile*, reg.3975, fol.423). In a contract dated 9 June 1494, the deputies of the city of Padua set out an agreement with master mason Giovanni di Riccardo for the renewal of four large arches (*Archivio notarile*, reg.761, fol.394).

There is evidence for the rebuilding of the Carmine dome in a contract dated 16 June 1495 made by Padua city council with master masons Lorenzo da Bologna and Piero Antonio da Modena (*Archivio notarile*, reg.762, fol.133v.). Reconstruction work on the church of S.Maria del Carmine went on for many more years and was only completed in 1523.

▲ 1491 01 24 23:50 UT

localities	lat.	long.	I
Padua	45 24	11 53	D (VI-VII)?

< 374 > 1491 Spring Shatax [eastern Turkey]

source colophon in Xacikyan (1967, p.178, no.230)

literature Zeyt'unyan (1991)

In the spring of 1491, an earthquake was felt at Shatax (Çatak, to the south of Lake Van) but there was probably no damage. The earthquake is recorded, in extremely vague terms, in a colophon in an Armenian gospel, written by a scribe called Israyel in the monastery of An'oronk' at Shatax, in the year 940 (19 November 1490 – 17 November 1491): "...in the bitter years, when in spring the earth trembled".

...ի դառնացեալ ժամանակիս, որ սարսրեցաւ յերկիրս ի գարնանսնայր ժամանակիս..

The very generic chronological information in this colophon does not allow us to estab-

lish with any certainty whether this was an effect of the large earthquake of 24 April 1491 (see the following entry) or of a local event.

△ There are no elements with which to indicate the parameters.

(375) 1491 April 24 Cyprus > fissures <

- sources 1 ASVe, *Senato Mar*, 13, fol.47v., Order, 27 May 1491; fols.51v., 53v., Petition and reply, 17 May 1491; fols.73v.-74r., Order, 23 October 1491; fols. 75v.-76r., Order, 19 December 1491; *Senato Mar*, 14, fol.31v., Order, 21 February 1494; BMCCorrer, Venice, *Cicogna*, 3534, *Diario veneto*, fol.7; Letter, in Figliuolo (1995, pp.208-10); *Chron. min. Byz.* 28.17 (in Schreiner 1975, p.212); al-Suyuti, *Kashf*, 59; Ibn Iyas, *Bada'i*, III, 281-2; Ibn Tulun, *Mufakhat*, I, 139; Dietrich von Schachten, in Grivaud (1990, pp.133-5); Reinhard von Bemmberg, in Grivaud (1990, p.140); Casola, *Viaggio*, p.48; Alexander von Zweibrücken, in Grivaud (1990, p.157); Suriano, *Il Trattato*, p.219; Sanudo, *Le vite*, II, p.630
- sources 2 Heinrich von Zedlitz, in Grivaud (1990, pp.138-9); Hans Schürpf, in Grivaud (1990, p.163); Lusignano, *Chor*, fol.84
- historiography Hill (1948); Darrouzès (1958); Schreiner (1977); Taher (1979); Figliuolo (1995, 1995-96); Stavrides (1998); Figliuolo (2002)
- catalogues d. Sieberg (1932a); Galanopoulos (1955); *Ambraseys (1965); Ben-Menahem (1979); Evangelatou-Notara (1993); *Ambraseys *et al.* (1994)
- catalogues p. Poirier and Taher (1980); Bektur and Alpay (1988)

On 24 April 1491, at about 17:00 UT (the twenty-fourth hour, "Italian time"), a strong earthquake struck the island of Cyprus, especially affecting the towns of Limassol (or Lemesos), Famagusta, Nicosia (Lefkosia) and Paphos. The church of St. Athanasius Pentescenites, which may have been situated near Kophinou, collapsed, as did the church of the Holy Cross (Stavrovouni) on Mt. Olympus. At Cerines (Kyrenia or Girne) and Saline (Larnaca) two towers were damaged. At Cairo the shock was slight; at Damascus, few people were aware of it. The earthquake also had an environmental effect: Mt. Olympus was split open in the middle.

The slight shock felt at Cairo and Damascus on 1 May 1491 before sunrise (around 3:00 UT at that time of the year) was probably an aftershock of the 24 April earthquake.

Historical sources: an overall view

The historical context is that of Venetian occupation. The island of Cyprus had in fact been a Venetian possession since 1489, when the queen of the island, Catherine Cornaro, who was of a famous and noble Venetian family, ceded it to the Republic of Venice. In 1468, she had married James II Lusignan; in 1473 she was left a widow, and the following year her son, James III Lusignan, also died, leaving her to govern the island on her own. In February 1489, Venice sent her elder brother, George, to Cyprus, and he succeeded in persuading his sister to abdicate in favour of Venice. The following March, she left Cyprus and spent the rest of her life at Asolo, in the Veneto.

The earthquake is recorded in numerous reliable narrative and documentary sources. The greatest detail is provided by Venetian sources, as regards both damage and reconstruction. For the purposes of this study we tracked down the 6 documents cited by Figliuolo (1995-96), now in the State Archives in Venice (set out below in the original) but never used in the seismological literature. In addition to analysing these sources, we also analysed Arabic sources already known to the seismological literature (Ambraseys *et al.* 1994). We also added to the corpus of sources by analysing contemporary Byzantine texts, amongst which we found just one useful source (*Chron. min.*

Byz. 28.17). All this has substantially increased our knowledge of the earthquake, and has also allowed us to classify damage at three localities (Kophinou, Stavrovouni, and Kyrenia) which had not previously been recorded in seismological literature.

Venetian sources

These consist of a manuscript letter and diary, and a number of unpublished documents in the Archivio di Stato in Venice.

A letter sent from Venice to Milan provides important evidence of earthquake effects at Paphos, Limassol, Saline, Famagusta and Nicosia, as well as at the church of the Holy Cross (Stavrovouni). The original manuscript text is in the Archivio di Stato in Milan (*Sforzesco*, Potenze estere 646, Turchia; published in Figliuolo 1995, pp.208-10). The information in question had reached Venice in letters brought by a Cypriot knight of the Order of Knights Hospitallers of St. John, who had come from Rhodes, and by the captain of a ship which left Cyprus on 25 April, the day after the earthquake. A later hand has added the date and time of the earthquake in the top margin: "1491, 24 April, at the twenty-fourth hour" (1491, *adi 24 aprilis, a hore 24*).

There is also an anonymous manuscript *Diario veneto* in the Library of the Museo Civico Correr in Venice, which records more general information, based on news which reached Venice on 3 June. What it has to say is partly similar to the information in the preceding source, but is limited to Famagusta and Nicosia.

The documents in the *Senato Mar* collection (reg.13 and 14) in the Archivio di Stato in Venice are particularly informative about fiscal and other measures taken by the Venetian Republic in connection with reconstruction work in Cypriot towns. Listed below are the locations, buildings and dates referred to in these measures: Famagusta, 17 May 1491; Nicosia, church of St. Sophia, 27 May 1491, 23 October 1491, 19 December 1491; Paphos, the main tower, Cerines, the castle tower, 21 February 1494.

Byzantine sources

These include a *Notula* written by *papas* Athanasius Pharis on the day of the earthquake and now preserved in manuscript (*Chron. min. Byz.* 28.17) of *Bibliothèque National de France* (*graecus* 624, fol.2v.).

Arabic sources

these consist of three chronicles by contemporary authors: al-Suyuti, Ibn Iyas and the Syrian historian Ibn Tulun, who report two shocks at Cairo and Damascus. Although there are chronological discrepancies between them, we think all three are referring to the shocks of 24 April and 1 May 1491.

Accounts written by travellers to the Holy Land

Six travellers, of whom four were from Germany, one was Swiss (their texts are gathered together in Grivaud 1990) and one Italian (ed. Porro 1855), called at Cyprus on pilgrimages to the Holy Land during the years 1491-1497. Some of the evidence they have passed down to us is particularly significant. Dietrich von Schachten, for example, was at Nicosia when the earthquake struck, and also stopped at Paphos and Famagusta in July and then September in that same year. Reinhard von Bommelberg stopped at Limassol in July and then September 1493; a Milanese priest called Pietro Casola also stayed at Limassol on 12 and 13 July 1494; and in August-September 1495, Alexander von Zweibrücken, a count palatine, was there in the company of his brother-in-law and his secretary, Johann Meisenheimer, who was probably responsible for writing his *Reyssbuch*. The information provided by Heinrich von Zedlitz, who was in Cyprus in July-August 1493, and by Hans Schürpf, a Swiss pilgrim who was in Cyprus in 1497, is in much more general terms. To this evidence we should probably add that of Francesco Suriano, though he dates the earthquake to 1480.

Earthquake effects by localities, based only on primary sources

Kophinou

The church of St. Athanasius Penteschenites collapsed. This church has not been identified. It may perhaps have been near Kophinou, since the river there is called Pentaschini. The source is the *Notula* written by *papas* Athanasius Pharis (*Chron. Min. Byz.* 28.17): "In the year 1491, there was a great earthquake on 24 April, which was the Sunday of the Paralytic. [...] the church of our holy father Athanasius Penteschenites at Pentesche also completely collapsed. [...] I, *papas* Athanasius Pharis of the village of Kophinos, have written this, on 24 April of the said year, to express my sadness".

τὴν ἐχρονίαν ,αυρα' Χριστοῦ ἐγένετον σεισμός μέγας εἰς τὴ μέρα ἀπριλλίου κδ', ἡμέρα κυριακῆ, ἢ ποία κυριακῆ ἦτον τοῦ Παραλύτου. [...] ἐχάλασε καὶ ἡ ἐκκλησία τοῦ Πεντήσχην, τοῦ ὁσίου πατρὸς ἡμῶν Ἀθανασίου τοῦ Πεντησχηνίτου, ἐκ βάρου. [...] διὰ ἀθύμησιν ἔγραψα ἀπριλλίου κδ', ἐχρονίας ἀνωθεν, παπᾶς Ἀθανάσιος Φάρης ἀπὸ χωρίου Κοφίνου.

Stavrovouni: church of the Holy Cross on Mt. Olympus

The church of the Holy Cross collapsed. Mt. Olympus was split open in the middle. The church of the Holy Cross no longer exists; the attached Benedictine monastery (present-day Stavrovouni, to the west of present-day Larnaca) stood on the highest peak of a mountain which was known in earlier times as Mt. Olympus. The highest point of the Troodos Mountains further to the west now bears that name. The sources are: the letter sent from Venice to Milan, the *Notula* written by *papas* Athanasius Pharis, the manuscript *Diario veneto* and Francesco Suriano's account of his travels. In the letter sent from Venice to Milan, we read: "The mountain of the cross has split open in the middle; that is where there stood a church of the Holy Cross occupied by Benedictine monks (St. Helen had it built after the discovery of the Holy Cross), and it too lies in ruins".

La montagna de la croce è ffesa per megio; dove era una chiesa de Santa Croce ne la quale habitavano monaci de san Benedecto (fece far sancta Helena dopos la inventione de la santa croce), è similmente a terra ruinata.

The *Notula* written by *papas* Athanasius Pharis (*Chron. Min. Byz.* 28.17), records: "In the year 1491, there was a great earthquake on 24 April, which was the Sunday of the Paralytic. [...] The [church of] the Holy Cross which stood on Mt. Olympus also collapsed [...] I, *papas* Athanasius Pharis of the village of Kophinos, have written this, on 24 April of the said year, to express my sadness".

τὴν ἐχρονίαν ,αυρα' Χριστοῦ ἐγένετον σεισμός μέγας εἰς τὴ μέρα ἀπριλλίου κδ', ἡμέρα κυριακῆ, ἢ ποία κυριακῆ ἦτον τοῦ Παραλύτου. [...] ἐχάλασε καὶ ὁ Σταυρός τοῦ Ὀλυμπίου, ὁποῖος ἦτον ἀπὸ εἰς τὸ βουνί. [...] διὰ ἀθύμησιν ἔγραψα ἀπριλλίου κδ', ἐχρονίας ἀνωθεν, παπᾶς Ἀθανάσιος Φάρης ἀπὸ χωρίου Κοφίνου.

The manuscript *Diario veneto* records:

"On 3 June [1491], the following news reached this town: that on 24 April, the day before the feast of St. Mark, there was a greater earthquake throughout the kingdom of Cyprus than had ever been experienced before. [...] in the town of Nicosia, too, the event did very great damage, reducing to ruins both the royal palace and the church at the archbishop's palace and a large part of the mountain on which stood a church: the whole of the mountain was split open and the church badly damaged".

Adì 3 zugno vene nuova in questa terra; como adì 24 del mexe de april seguente che fo la vigilia de san Marcho, fo un taramotto per tutto el reame de Cipri, tanto grande che mai non fo el mazor. [...] eciam nela citade de Nichoxia accade questo fatto grandissimo danno et haveva ruinato el palazzo reale e la ecclesia de l'arcivescovado et una gran

parte de montagna la qual haveva una giexia sopra, tutta quella montagna era aperta e ruinata la giexia.

We think it very likely that a passage in the 1524 version of Francesco Suriano's work is referring to effects on Mt. Olympus, though he dates the earthquake to 1480: "Similarly in 1480 in Cyprus, in the town of Nicosia, there was so great an earthquake [...]; and a mountain split across into two parts".

Item, del mille quatrocento otanta in Cypro, ne la città de Nicosia, fo sì grande terremoto [...]; e spaccosse una montagna attraverso in do parte.

Limassol (or Lemesos)

All its houses and churches were badly damaged (*ruinoreno*). Half the fortress collapsed. The dome of the cathedral of the Holy Cross collapsed. In 1494, the cathedral was still in danger of collapse, and no steps had been taken to repair the fortress. In 1495, the remaining inhabitants were forced to live in small shacks. The sources are: the letter sent from Venice to Milan, the *Notula* written by *papas* Athanasius Pharis, and the accounts of three travellers: Reinhard von Bommelberg, Pietro Casola and Alexander von Zweibrücken. In the letter sent from Venice to Milan, we read: "The keep and fortress of Limassol, a castle on the coast, were reduced to ruins, along with all the local houses and churches".

Lo toriono et forteza de Limiso, castello su la marina, con tute le case e chiesie ruinoreno.

The *Notula* written by *papas* Athanasius Pharis (*Chron. Min. Byz.* 28.17), records:

"In the year 1491, there was a great earthquake on 24 April, which was the Sunday of the Paralytic. [...] and the dome of the cathedral of Lemesos [Limassol] collapsed, the church of the Holy Cross, Giver of Life. [...]. I, *papas* Athanasius Pharis of the village of Kophinos, have written this, on 24 April of the said year, to express my sadness".

τὴν ἐχρονίαν αὐθαΐ Χριστοῦ ἐγένετο σεισμός μέγας εἰς τὴ μέρα ἀπριλλίου κδ', ἡμέρα κυριακῆ, ἣ ποῖα κυριακῆ ἦτον τοῦ Παραλύτου. [...] καὶ ἐχάλασε καὶ ἡ τροῦλλα τῆς Καθολικῆς Λεμεσοῦ, τοῦ Ζωοδότου Σταυροῦ. [...] διὰ ἀθύμησιν ἔγραψα ἀπριλλίου κδ', ἐχρονίας ἄνωθεν, παπᾶς Ἀθανάσιος Φάρης ἀπὸ χωρίου Κοφίνου.

A German pilgrim called Reinhard von Bommelberg (in Grivaud 1990, p.140) stopped at Cyprus on his journey in July and September 1493. He records:

"At dawn we reached Limassol, an ancient town in the kingdom of Cyprus which was largely destroyed some time ago by a sultan; and in those days it was struck by earthquakes and completely reduced to ruins. It has a large and well-equipped castle, but that too has been half destroyed by earthquakes".

da khamen wier mitt den sonnen aufgannng nach gheenn Linmischo, welhes ein altte statt in dem künigreich Ciperen vor zeitten hatt sie ein Soldann vast zerbrochen, unnd die erdtpidtmen zue diser zeitten verbrechen unnd verderben sie ganntz unnd gar; unnd alda ist gar ein guettes starkhs voestes schloss, aber die erdtpidtmen zerbrechen es auch albs.

Pietro Casola, a Milanese priest, called at Limassol on 12 and 13 July 1494, and noticed that the town was in a serious state of abandonment. He writes:

"When we landed the galley we went immediately, as was fitting, to the Cathedral, which is indeed still upright, but on the point of collapse. [...] I went to see this city or remains of a city. I saw from the ruins and beautiful walls, that it must have been a large and beautiful place, but there is not a single good house in the whole city. [...] All the other churches are in ruins. [...] I went to the castle, which is guarded by a soldier. Certainly it must have been a fine strong place; nevertheless it is also in a state of collapse, and nothing is being done to repair it. [...]. When I asked the cause of the destruction of such a great city, I received various explanations. Some said it was due to

earthquakes, other attributed it to the many incursions of the Moors. [...]. When I asked why the Signoria did not seek to repopulate it, standing as it does on the sea, he told me that people do not care to settle there on account of the earthquakes, and also because it is a very unhealthy place. The inhabitants have in truth an unhealthy appearance. They all appear to be ill. [trad. Newett]".

Smontate de Galea, come era onesto, andassemo subito a la Giesia Cathedrale, la qual è pur asai in pede, ma pocho li manca non ruini. [...] andai a vedere questa citade o vero vestigio de citade. Vidi debbe esser stata una grande e bella cosa e le ruine e belle pariete li sono; ma in tutto non gli è una bona caxa. [...] Altra Giesia non li è che non sii per terra. [...] Sono stato in el castello el qual è guardato da uno fante: certo doveva esser stato una bella e forte cosa, pur va per terra, e altro riparo non si gli fa. [...] Domandando la causa de la destructione de una tanta citade, hone havuto diverse opinioni: chi dice sono stati terremoti, chi dice sono state le molte incursioni de Mori [...] Domandando qual era la causa, che la Signoria non procurava de farla habitare, siando sopra el mare como è, me disse che le persone li staveno mal volontera per li terremoti, et anche perchè è molto infirmo locho. Hanno in vero tutti cattivo volto; pareno tutti li habitatori amalati.

Alexander von Zweibrücken (Grivaud 1990, p.150), who was in Cyprus in August-September 1495, also refers to the poor living conditions of the remaining inhabitants: "The town of Limassol is in a state of total destruction. Four years ago, there was a great earthquake in the kingdom of Cyprus, and most of the tall towers, churches and houses in Cyprus completely collapsed, and the town and castle of Limassol were completely destroyed by the same earthquake, and since then there are no houses, but just small shacks with poor people living in them".

Lymison ist eine ganz zerbrochen Statt. Item vor vier Jahren vergangen, ist ein grosser Erdtbiden im Königreich von Cypren gewest, dass der meist theil von den hohen thürnen, kirchen, unnd häusern in Cypren seindt ganz nider gefallen, unnd vom demselben Erdtbiden ist die Statt und Schloss von Lymison ganz zerbrochen, unnd seindt nach daselbst kein häuser, sonder als kleine hütten, da eyttel Arme leut wonen.

Famagusta

A large part of the castle, some towers, and many houses and palazzi were badly damaged ("ruinate"). Much of the church of St. George collapsed. There may also have been damage to structures at the mouth of the port. The Venetian Senate ordered building materials to be sent for reconstruction work. The sources are: the letter sent from Venice to Milan, the manuscript *Diario veneto*, Dietrich von Schachten, and a document dated 17 May 1491 in the Archivio di Stato in Venice. In the letter sent from Venice to Milan, we read:

"Most of the castle of Famagusta, together with many houses and the Greck church of St. George, are badly damaged, to such an extent that it is feared that the mouth of the harbour has been affected and damaged".

La maggior parte del castello di Famagosta, con asai case et una chiesa de San Zorzo alla greca, sono ruinate, per modo se dubita la boca del porto sii alterata et guasta.

The manuscript *Diario veneto* records:

"On 3 June [1491], the following news reached this town: that on 24 April, the day before the feast of St. Mark, there was a greater earthquake throughout the kingdom of Cyprus than had ever been experienced before. It was so powerful that it badly damaged the whole town of Famagusta, including towers, the surrounding walls, and many palazzi".

Adì 3 zugno vene nuova in questa terra: como adì 24 del mexe de april seguente che fo

la vigilia de san Marcho, fo un taramotto per tutto el reame de Cipri, tanto grande che mai non fo el mazor. In tanto che avea ruinato tutta la terra de Famagosta et tore et mure de intorno et asai palazi.

Dietrich von Schachten (in Grivaud 1990, pp.133-5) visited Famagusta on 24 September 1491, and records: "[...] the same town [of Famagusta] there has a fine and well-built church, but most of it was destroyed in the earthquake [...]"

[...] darzu hatt dieselbige stadt eine schöne Kierchenn, woll erbawett, doch hatt das Erdtbiedenn ein gutt theil zerbrochen [...].

On 17 May 1491, the Venetian ambassador at Famagusta sent a petition to the Venetian Senate requesting that the lieutenant and his counsellors, who resided at Nicosia, should move to Famagusta in order to be in a better position to carry out aid work. He also requested that timber and ironware should be sent for the first phase of reconstruction. The Senate accepted these requests, and also decided to supply free lime to anyone intending to repair or completely rebuild a church or house in the town (*Senato Mar*, reg.13, fols.51v., 53v.):

"1491, 17 May, Cyprus. [...] Your Illustrious Serenity is humbly begged to deign to make provision for the lieutenant and his counsellors, secretaries and other officials to move to Famagusta, so that he can see to the dwellings in that wretched and desolated town, which indeed has great need of them, for it has recently been so badly reduced to ruins that you might think it would shortly disappear entirely. If more action is not taken than in the past, the town will be in the same situation as other coastal towns on the island, all of which are laid waste, and only their fortresses remain. It is thus not only necessary to see to dwellings, but even more important is to fortify the town, for that is the key to the kingdom's security [...]" Eleventh. Your Excellent Serenity is begged graciously to grant to that community that a substantial quantity of timber of all kinds be sent from there, and also wrought iron for repairing houses, and that this timber and ironware be sold solely to the inhabitants of Famagusta [...] and if the poor need such timber and ironware, it should be given to them [...] and it will be appropriate to repair many houses which are falling apart, and rebuild many which are in ruins, for there is a great lack and shortage there of the above-mentioned materials.

[reply from the Venetian Senate]

Let reply be sent that we are satisfied and well content, and we shall arrange for timber and wrought iron to be sent for repairing houses in that place; we shall arrange for these materials to be distributed as long as they are in demand, and we make this additional arrangement, that all those who wish either to repair or completely rebuild a church or house in the town of Famagusta shall be supplied by our said *capitano* with any necessary and appropriate lime, free of all charge".

MCCCCLXXXI, die XVII maii. Cypri. [...] Reverentemente se supplica ala vostra illustrissima serenità che là se degni proveder che se transferisca a Famagusta el locotenente cum li soi consiglieri, camerlengi et secretari a zò più facilmente se possa proveder ala habitatione de quella poverissima et disolata cita che altramente la qual ne ha grandemente de bisogno per esser quella da pocho tempo in qua una gran parte ruinada in modo che se pol creder certamente che in breve del tuto mancharà non li facendo altra provision de quello che per lo passato esta facto serà ala condition dele altre terre maritime de quella isola lequal del tuto son disolate et de esse non li é rimasto altro cha le loro forteçe. Siché el non é manco necessario al proveder de habitare quella cha el suo fortificar siando la chiave et segurtà de quello regno, cossa importantissima al suo stado [...]. Undecimo. Se supplica ala excellentissima serenità vostra che quella vogli per sua graçia conceder a quella comunità che de li el sia mandato per quella una certa bona quantità de legname de ogni sorta, et similiter de ferramenta lavorata per reparatione dele case, deli et che tal legnami et ferramenta se habino a vender de li a

Famagosta ali habitanti de quella solamente [...] et se poveri haverano bisogno de tal legnami et ferramenta li sii dato [...] et sarà coson de reparar molte case che vano in ruina et refar molte che sono ruinate perché de li é gran manchamento et carestia dele prediacte cosse.

Respondetur esse contentos bono et alacri animo sibi complacere sicque dabimus operam quod illuc conducentur lignamina et ferramenta laborata pro reparatione domorum illinc que distribui faciemus prout petitur et requiritur cum hac etiam additione quod omnibus illis qui volent vel reparare vel de novo construere aliquam ecclesiam vel domum in dicta civitate Amocuste dari debeat per dictum nostrum capitaneum calcis que fuerit opportuna et necessaria absque omni omnino solutione.

Nicosia (or Lefkosia)

Many houses were badly damaged (*ruinate*). Amongst secular buildings affected, the lieutenant's *palazzo* partially collapsed, killing all his horses. Amongst ecclesiastical buildings, the principal churches in the town collapsed, as well as many others in the countryside, including that of the convent of the Holy Cross. At the cathedral of St.Sophia, the choir collapsed, together with the high altar and all the choir ceilings. The Venetian Senate made a grant of one thousand ducats, sent building materials, and adopted a number of fiscal measures in order to assist in the reconstruction of the cathedral of St.Sophia. The sources are: a letter sent from Venice to Milan, the manuscript *Diario veneto*, the German traveller Dietrich von Schachten, a manuscript *Notula*, Francesco Suriano's account of his travels, and three documents in the Archivio di Stato in Venice, respectively dated 27 May, 23 October and 19 December 1491. The letter sent from Venice to Milan:

"In the town of Nicosia, the cathedral church of St.Sophia is badly damaged, that is to say the choir, the high altar and all the choir ceilings are in ruins; and this church enjoyed the reputation as the finest in the Levant. Many houses are also in ruins, and they say that part of the lieutenant's *palazzo* has also collapsed, and all his horses are dead".

Ne la città de Nicoxia è ruinata la chiesa maggior, intitulata a sancta Sofia: cioè el coro con l'altare grandio et tute le volte del coro, che haveva fama de più superba chiesa de Levante; sono etiam ruinate molte case, dove dicesi essere ancora a terra una parte del palazzo del locotenente, e morti tuti li suoi cavalli.

The manuscript *Diario veneto* records:

"On 3 June [1491], the following news reached this town: that on 24 April, the day before the feast of St.Mark, there was a greater earthquake throughout the kingdom of Cyprus than had ever been experienced before. [...] in the town of Nicosia, too, the event did very great damage, reducing to ruins both the royal palace and the church at the archbishop's palace".

Adì 3 zugno vene nuova in questa terra: como adì 24 del mexe de april seguente che fo la vigilia de san Marcho, fo un taramotto per tutto el reame de Cipri, tanto grande che mai non fo el mazor. [...] eciam nela citade de Nichoxia accade questo fatto grandissimo danno et haveva ruinato el palazzo reale e la ecclesia de l'arcivescovado.

Dietrich von Schachten (in Grivaud 1990, pp.133-5) was in Nicosia at the very moment when the earthquake struck, and he has left us this eye-witness account:

"Similarly, when we reached Cyprus on the day after the feast of St.George [24 April], there was a terrible earthquake shock during the night. It was a terrifying event, and did great damage throughout the island of Cyprus, and especially in the capital, called Nicosia, a quite large town, though not well built, and the seat of an archbishop. That night the earthquake destroyed the principal church, which was a fine building and dedicated to St.Sophia.

Item ihnn Cipernn, wie wir da dar kamenn, denn nechstenn tag nach S.Georgenn tag kam gegenn der nacht ein Erdtbiebunge fast greuschlichenn, das doch sehr erschreckliches dieng was undt fast grossenn schadenn ihnn der gantzenn Innsell Cipri gethan hatt undt sönnderlichen ihnn der hauptstadt, heisset Nicisia, ist fast eine grosse stadt, doch nichtt woll erbawett undt ist ein Erzbisthumb, da hatt das Erdtbiebenn die haubtkierchenn, das eine schöne veste kierchenn gewessenn ist, dieselbe nacht ein gutt theil niedergeworffenn, heisset zu S.Sophia.

The *Notula* written by *papas* Athanasius Pharis (*Chron. min. Byz.* 28.17), records: "In the year 1491, there was a great earthquake on 24 April, which was the Sunday of the Paralytic. And Hagia Sophia [at Nicosia] collapsed, and many churches in the countryside. The [church of] the great Cross also collapsed [...]. I, *papas* Athanasius Pharis of the village of Kophinos, have written this, on 24 April of the said year, to express my sadness".

τὴν ἐχρονίαν ,αυφα' Χριστοῦ ἐγίνετον σεισμός μέγας εἰς τὴ μέρα ἀπριλλίου κδ', ἡμέρα κυριακῆ, ἢ ποία κυριακῆ ἦτον τοῦ Παραλύτου. καὶ ἐχάλασεν ἡ Ἁγία Σοφία καὶ πολλὰς ἐκκλησίας εἰς τὴ χώρα. ἐχάλασε καὶ ὁ ἀθένητης ὁ Σταυρός ὁ μέγας [...] διὰ ἀθύμησιν ἔγραψα ἀπριλλίου κδ', ἐχρονίας ἀνωθεν, παπᾶς Ἀθανάσιος Φάρης ἀπὸ χωρίου Κοφίνου.

On 27 May 1491, the Venetian Senate gave instructions, intended solely for the lieutenant of Cyprus and the island's counsellors, to carry out repairs to the church of St.Sophia at Nicosia, if work proved to be needed (*Senato Mar*, reg.13, fol.47v.):

"1491, 27 May. To the lieutenant and counsellors of Cyprus and their successors. [...] In particular, you are to provide us by letter with clear and detailed information as to the state of the chalices and priestly vestments in the said church [St.Sophia at Nicosia], and should you find that the fabric of the church is in need of repair, you will give your support and make complete and unfailing arrangements for repairs to the said church to be carried out, so that no further damage may result, both in honour of God and for the satisfaction and joy of all those very faithful people.

MCCCCLXXXI, die XXVII maii. Luocotenenti et consiliariis Cypri et successoribus suis. [...] Preterea vestris literis dabitur nobis notitiam distinctum et particularem de conditione calicum et sacerdotalium indumentorum existentium in ecclesia predicta (S.Sofia di Nicosia) et si videretis etiam fabricam ecclesie indigere reparatione eritis cum suffraganeo et dabitur operam ut omnino et infallanter provideatur reparationi predictae ne sequi possit aliqua ruina tum pro honore Dei quam pro satisfactione et contentamento totius illius fidelissimi populi.

On 23 October 1491, the Venetian Senate issued various orders concerning repair work at the cathedral church of St.Sophia in Nicosia. A grant of one thousand ducats (two hundred and fifty per year for four years) was made, and it was decided to send timber and tools for repair work. The following fiscal measures were also taken in connection with repair work. The archbishop of Nicosia was to pay two hundred and fifty ducats per year for four years. The canons and other clergy of St.Sophia with an income of more than forty ducats were to pay a tenth per year for four years, and clergy with an income of less than forty ducats per year were to pay half of one tenth. Similar provisions were made for lay citizens with incomes of forty ducats or more: they were to pay half of one tenth. Furthermore, their representative at the Roman Curia was requested to obtain an indulgence, valid for the next six years, for those who made contributions to the repair of St.Sophia (*Senato Mar*, reg.13, fols.73v-74r.): "1491, 23 October. [...] Thanks not only to letters from our governor in Cyprus, but also through many other means of communication, this Council [the Senate] and the whole city [of Venice] have already clearly learned how greatly the very faithful community

and our people of Leukosia have been affected by damage to the cathedral church of St.Sophia in that town, and how promptly, by day and night, all of them, including the womenfolk, have reacted to the earthquake damage, and with how much good will they wish the said church to be repaired, for they see it as a unique place of refuge for all, and especially for those who observe the Latin rite. [...]. For such holy and essential work (as is indeed the restoration of this archiepiscopal church), we consider it appropriate not only to offer our support, but also to establish time limits and procedures for completely restoring and repairing this church for the pleasure and consolation of these very faithful people, for we are gratified by their efficacious prayers and the petitions which we accept in such a holy and religious cause, and in order that everyone shall know how great is our affection for the said island”.

MCCCCLXXXI, die XXIII octobris. [...] Superiori tempore, non tam ex literis regiminis nostri Cypri, verum etiam per omnem viam, hoc Consilium et universa urbs plane intellexit quantum fidelissima universitas et populus noster Leucosie, supra cetera omnia, extimaverit ruinam ecclesie cathedralis Sancte Sophie ipsius civitatis et quam prompte, die noctu quam, omnes, etiam mulieres, incubuerint abductioni ruinarum sequutarum ex terremotibus et demum quanto animi affectu cupiant instauracionem dicte ecclesie tamquam unici confugii omnium et precipue servantium ritum latinum. [...] supplicatum dominio nostro dignemur huic tam pio et involabili operi (ut erit instauratio ipsius archiepiscopalis ecclesie) pro sua solita clementia et benignitate, non solum suol porrigere favores, verum etiam dare modum et formam ut pro universali gaudio et consolatione illius fidelissimi populi templum illud celeberrimum omnino instaurari et profici possit, cum igitur complacendum sit tam efficacibus precibus et supplicationibus porrectis in tam pia et religiosa causa et ut omnes intelligant quantum cordi est nobis insula predicta.

The document goes on to approve a series of fiscal measures in support of reconstruction work at the cathedral of St.Sophia. On 19 December 1491, the Venetian Senate reiterated and confirmed the decisions taken on 23 October regarding the cathedral of St.Sophia, and laid down that payment for the materials required for reconstruction work should be made by the *Camera* of Cyprus in the following six months (*Senato Mar*, reg.13, fols.75v.-76r.):

“19 December [1491]. The *Savi* of the Council and the *savi* of *terra firma*.

It has been established by this Council [the Senate], that for restoration and reconstruction work at the cathedral church of Leukosia, our State shall provide and send from Venice timber and tools to the value of one thousand ducats, but since no-one will be willing to supply these materials except by the authority and with the approval of this Council, let it be known to them that they will receive their payment.

It is hereby laid down, by the authority of this assembly, that all those who supply our State with the said timber and tools will be paid all the money owed to them by our *Camera* of Cyprus during the six months following the arrival of these materials in Cyprus, until payment for these materials has been made in full, at current prices, up to a maximum of the said sum of one thousand ducats. Therefore, let our governor be instructed in writing to arrange for these instructions to be strictly adhered to, and put into operation in such a way that they shall be completed within six months of the arrival of these materials in Cyprus”.

Die XVIII decembris [1491]. Sapientes Consilii, sapientes terre firme.

Decretum fuit, per hoc Consilium, ut, pro instauracione et fabrica ecclesie cathedralis leucosiensis, per Dominium nostrum provideri hinc debeat de lignaminibus et ferramentis necessariis usque ad sumam ducatorum mille et, quia non esset aliquis qui vellet dare res predictis, nisi mediante auctoritate et deliberacione huius Consilii, sciat tamen recepturus sit satisfactionem suam.

Vadit pars quod, auctoritate huius Consilii, omnibus illis, qui servient Dominio nostro de dictis lignaminibus et ferramentis, obligentur et obligate intelligantur omnes pecunie illius camere nostre Cypri menses sex postquam dicte res in Cyprum fuerint appulse, usque ad integram et completam satisfactionem rerum predictarum pro eo pretio quod ascendent usque ad predictam sumam ducatorum mille sic quam scribatur et mandetur illi nostro regimini ut observet faciat quam diligentissime observari et executioni mitti, faciendo solutiones ipsas cum omni celeritate et expeditione menses sex postquam in Cyprum res ipse fuerint conducte.

We think it very likely that a passage in the 1524 version of Francesco Suriano's work is referring to the earthquake of April 1491, because of references to damage at the church of St. Sophia, though he dates the earthquake to 1480:

"Similarly in 1480 in Cyprus, in the town of Nicosia, there was so great an earthquake that a great number of palaces, houses and churches collapsed, in particular that of St. Sophia, which is the seat of an archbishop".

Item, del mille quatrocento otanta in Cypro, ne la città de Nicosia, fo sì grande terremoto, che cascò grande moltitudine di palazi, case e chiesie, maxime Santa Sophia, che è arcivescovato.

There is also a reference to the damage to the church of St. Sophia in Marin Sanudo's *Vite dei Dogi*, where the earthquake is wrongly dated to 27 April:

"In the month of April, on the 27th day, there was a very great earthquake in Cyprus, which reduced to ruins not only the great chapel of Nicosia cathedral but other buildings as well".

Del mexe di april, a dì 27, in questo fo uno grandissimo terramoto in Cypro, ruinò la cappella granda di la chiesa cathedral di Nicosia, e altri hedificii.

Paphos

The castle and many houses and churches in the village were badly damaged (*ruinoreno*). The smaller of the two towers collapsed and was not rebuilt, its materials being used to repair damage to the larger one. It is worth remembering that Paphos had been in a state of abandonment for some years before the earthquake. The sources are: a letter sent from Venice to Milan, Dietrich von Schachten, and a document in the Archivio di Stato in Venice dated 21 February 1494.

In the letter sent from Venice to Milan, we read: "The castle of Paphos, and many houses and churches in the village, were badly damaged in an earthquake."

La rocha de Baffo, con molte altre case e chiesie del borgo, per terremoto ruinoreno.

Dietrich von Schachten (in Grivaud 1990, pp.133-5) was at Paphos in July 1491. He records: "[...] in that same place [Cyprus] there was formerly a town called Paphos, but it collapsed in the earthquake which struck the island two months ago".

[...] da ist ann demselbenn orte vor zeittenn eine stadt gewessenn, heisset Papho, siendt noch heuttiges tages zwene Thuerm da ann dem Meer, ist aber der eine gefallenn vonn demselbigenn Erdtbebenn, der dann derselbigenn Insul ist gewessenn vor zweienn Monatenn.

On 21 February 1494, the Venetian Senate decided to repair the larger of the two towers at Paphos, using materials from the ruins of the smaller one (*Senato Mar*, reg.14, fol.31v): "1493 [Venetian style = 1494], 21 February. [...] Furthermore, since the smaller of the two towers or fortresses at Paphos was almost completely reduced to ruins in the earthquake, and the other has some need of repair, we order our Cyprus government to have the larger of the two towers repaired and restored, for by using the stone from the fallen tower, which is now of no importance, the work can be done with ease

and little expense; and for the guarding of the larger tower, now to be repaired, the 20 wages which have been paid up to now shall continue. However, the other twelve wages which are currently paid for guarding the smaller tower, now in ruins, shall now be completely abolished, so that such unnecessary expense shall be removed from the burden of government.

MCCCCLXXXIII, die XXI februarii. [...] Insuper quam ex duabus turribus seu fortificiis Paphi minus ex terremoto pene totum corruit et aliud indiget aliquali reparatione committatur regimini nostro Cypri quod reparari et reaptari faciat maiorem dictarum turrium quod ex lapidibus alterius collapse et que nullius erat importantie facile et cum parva admodum impensa fieri poterit et ad custodiam ipsius maioris turris reparande continuent page XXti prout nunc sunt. Alie vero XII. que nunc deputate videntur custodie turris parve et dirupte cassentur penitus ut illa superflua impensa solevetur dominium nostrum.

Kyrenia [formerly Cerines]

The castle tower was damaged. On 21 February 1494, the Venetian Senate decided to repair the tower because of its great strategic importance.

The source is a document in the Archivio di Stato in Venice (*Senato Mar*, reg.14, fol.31v): "1493 [Venetian style = 1494], 21 February. [...] Let precise measures be taken and communicated to our said government, to have the damaged tower of the castle of Cerines repaired as soon as possible, in view of the great importance and general reputation of that place".

MCCCCLXXXIII, die XXI februarii. [...] Demum captum sit et mandetur regimini antedicto quod quandam turrin castelli Cerines scinidi ruptam instaurari quam primum faciant ob summam importantiam illius loci unicuique notissimam.

Larnaca (formerly Saline)

The collapse of a tower on to the stables below killed two horses. It is very likely that the tower stood on the ruins of the ancient settlement of Kition, where the port of Saline had been built, as we are informed by Alessandro Rinuccini, who visited the city in September 1474 (Figliuolo 1995, p.209, note 12).

The source is the letter sent from Venice to Milan. The text is as follows: "The tower of Saline, which was not guarded and had stables below it, was similarly reduced to ruins, and two horses were killed".

La torre de le saline, che non era guardata, dove sotto era una stalla, similmente ruindò, e morirono dui cavalli.

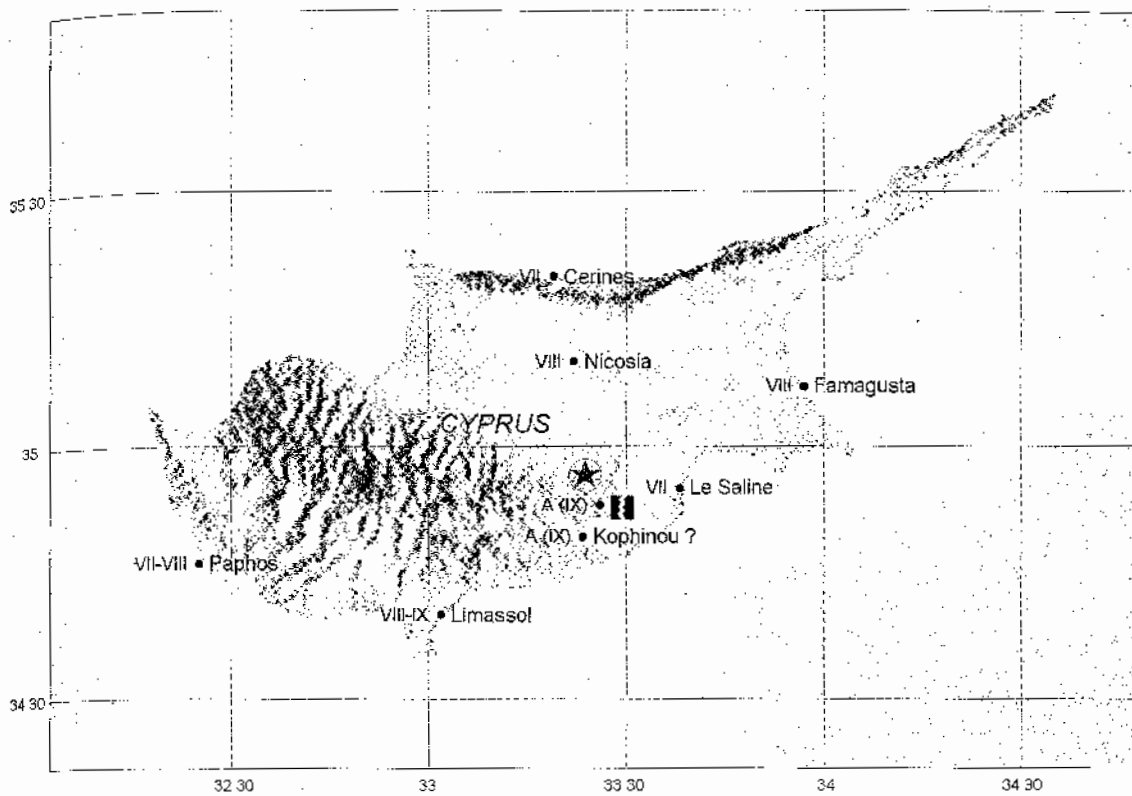
Cairo

There was a slight shock on 24 April, and another on 1 May. The sources are two contemporary Arab chroniclers. Al-Suyuti, whom we consider to be the more reliable, records: "On Sunday, half way through the month of *Jumada II* [24 April] 1491, there was a slight shock at Old Cairo (*Misr*). The earth also shook on Sunday 22 of that month [1 May].

في جمادى الآخرة زلزلت مصر زلزلة لطيفة يوم الأحد نصف الشهر ثم زلزلت أيضا يوم الأحد ثاني عشرين منه.

Ibn Iyas gives a different date from al-Suyuti for the second shock, and mentions a solar eclipse (there was a solar eclipse on 8 May: Oppolzer 1887, p.258, chart 129):

"In the month of *Jumada II*, after sunset, there was a slight earthquake at Cairo, which caused the earth to sway and then grow still again. [...] there was a total eclipse of the sun lasting for about 30 *daraja* and the earthquake of the day before occurred again, but the shock was very slight".



1491
April 24

0 30 km

fig. 145

و في جمادى الآخرة وقعت بالقاهرة زلزلة خفيفة بعض المغرب، و ماجت منها الأرض ثم سكنت. [...] و فيه كسفت الشمس كسوفاً تاماً، و دامت في الكسوف نحواً من ثلاثين درجة، و عادت الزلزلة التي وقعت بالأمس و كانت خفيفة جداً.

Damascus

A few people felt the shock of 24 April. There was another shock on 1 May. The source is the Syrian historian Ibn Tulun, who puts the first shock a day later than al-Suyuti. Ibn Tulun also mentions a lunar eclipse (there was a lunar eclipse on 23 May; Oppolzer 1887, p.366):

“During the night of Monday 16 *Jumada II* (25-26 April 1491), news spread amongst the people of Damascus that the earth had shaken immediately after sunset prayers, and that there had been an eclipse of the moon, but most people, including our master al-Muhaywa [?] al-Na‘imi, were not aware of it. [...] on Sunday morning, the twenty-second of this month, the first day of *Ayyar* (1 May), the earth shook again at Damascus, before sunrise”.

و في ليلة الاثنين سادس عشر جمادى الآخرة منها، شاع بين أهل دمشق أن الأرض تزلزلت عقيب صلاة المغرب، و أن القمر خسف، و لم يحس بذلك جماعات، منهم شيخنا الحيوى النعمي. [...] و في بكرة يوم الأحد ثاني عشرينه، و هو أول أيار، تزلزلت الأرض بدمشق أيضاً قبل طلوع الشمس.

The time given by Ibn Iyas and Ibn Tulun (after sunset) for the shock which we think occurred on 24 April, fits the suggested time of the twenty-fourth hour, “Italian time” (17:00 UT). At that time of the year at the latitude of Cairo, in fact, sunset was at about 18.30, local time; and if we add about half an hour, in order to take account of the fact that the shock occurred after sunset, that gives us about 19.00, local time, which is 17:00 UT.

▲
1491 04 24 17:00 UT ☉ = 34 56 33 24 I₀ = IX Me = 6.6 Sites: 10 EE: 1

localities	lat.	long.	I	localities	lat.	long.	I
Kophinou	34 49	33 23	A (IX)	Paphos	34 46	32 25	VII-VIII
Stavrovouni	34 53	33 26	A (IX)EE	Kyrenia	35 20	33 19	VII
Limassol	34 40	33 02	VIII-IX	Larnaca	34 55	33 38	VII
Famagusta	35 07	33 57	VIII	Caïro	30 03	31 15	IV
Nicosia	35 10	33 22	VIII	Damascus	33 30	36 19	III

< 376 > **1493 October 18 Kos island [southern Aegean Sea, Greece]**

sources 1 NLMalta, *Libri conciliorum*, Arch. 77, fols.111r.-v., 112r.-v.; BNCFlorence, *Magliabechiano*, XIII, 93, fol.31r.; Heinrich des Frommen von Sachsen, in Röhricht (1901b)

source 2 Bosio (1594)

historiography Coronelli and Parisotti (1688); Maiuri (1921-22 [1924]); Luttrell (1986); Figliuolo (2002)

catalogues d. Bonito (1691); Perrey (1850); Schmidt (1881); Sieberg (1932a); Galanopoulos (1955; 1961); *Papazachos and Papazachou (1997)

catalogues p. Ergin *et al.* (1967); Shebalin *et al.* (1974); Galanopoulos (1981, p.693); Bektur and Alpay (1988)

On 18 October 1493 at about 14:30 UT (an hour before sunset), the island of Lango (Kos), which lies in the southern Aegean about 100 km north west of Rhodes, was hit by a destructive earthquake: in the town of Narangia (present-day Kos) and the fortified settlements of Antimachia (Andimakhia), Pilli (Pylon) and Cefalo (Kefalos) all on the island, there was serious damage to most houses, as well as to parts of the walls and fortresses. There were many deaths and injuries, but the exact number is not given. There was also serious damage to castles on the little islands of Lero (Leros) and Calino (Kalymnos), though perhaps to a lesser extent than on the island of Kos, since it was from these two small islands that the first assistance was sent to the main island. The castles on the islands of Leros and Kalymnos (to the north of Kos), were subsequently repaired or rebuilt. There were also some collapses at the castle of St. Peter at the entrance to the port of Bodrum, on the Turkish coast opposite the island of Kos (for this information, see Figliuolo 2002, pp.896-904).

According to Luttrell (1986, pp.165-7), this earthquake was responsible for the final collapse of the famous mausoleum of Halicarnassus (Bodrum), considered to be one of the seven wonders of the world (it was built around the mid-4th century B.C.).

According to Figliuolo (2002, p.896), the earthquake was also responsible for damage at Rhodes, but in our opinion there is some doubt about this, for Domenico Malipiero's *Annali veneti* (the source referred to by Figliuolo), date the event to "this winter time", which fits the Rhodes earthquake of 18 December 1481 (see the entry concerned) better than that on Kos on 18 October, i.e. in the early autumn. Moreover, no contemporary sources refer to the island of Rhodes.

A few days after the earthquake, on 23 October, the Grand Master and Council of the Order of Knights of St. John of Jerusalem (the Hospitallers), whose headquarters was at Rhodes, decided to send the first urgent assistance to Kos. The promptness of the aid may have been inspired by fear of Turkish raids, for the previous year Antimachia had been attacked, and some time earlier, in 1464, the Turks had already tried to invade the island. Some ships with medicines and timber were the first aid to be sent to the islanders. On 26 October, more ships were sent with more substantial assistance: 800 wooden planks to make shacks for the inhabitants of Antimachia, and masons for the first reconstruction work on the castle and houses of Narangia and Antimachia, where the survivors wanted the settlement to be rebuilt on a different site.

It was also decided that some ships should stay along the coast in order to be able to intervene more easily where necessary.

The primary sources for this earthquake were brought to light by Figliuolo (2002), and are now in the archives of the Order of Knights of St. John of Jerusalem (the Hospitallers) in the National Library of Malta at La Valletta (*Libri conciliorum*, Arch. 77). The knights occupied the island of Kos from 1315 onwards. Their archives are in Malta because Charles V assigned that island to them after they lost their headquarters at Rhodes in 1522 as a result of a Turkish invasion.

In the Biblioteca Nazionale Centrale in Florence (*Magliabechiano*, XIII, 93, fol.31r.), we also found a reference to the earthquake by a traveller who went to Kos in 1497, four years after its occurrence. Reference to the earthquake is also made by another traveller, a German by the name of Frommen von Sachsen, who visited Kos in 1498.

Up to now, this earthquake has been known through the work of Giacomo Bosio (1594, II, pp.418-9), who wrote a history of the Knights of St. John based on archive sources. Bosio's work was used by Bonito (1691, pp.644-5) in his catalogue, and is an important and reliable secondary source. For the work and cost of reconstruction, see Figliuolo (2002).

We transcribe below two documents from the *Libri conciliorum* (The Books of the Council). The first of these (Arch. 77, fol.111r.-v.) deals with measures taken by the Grand Master and Council of the Hospitallers on 23 October 1493, five days after the earthquake, and provides brief information about the effects of the earthquake at four places on the island:

"23 October 1493. The reverend Grand Preceptor and the Procurator of the Treasurer General presented themselves before the very reverend Cardinal Grand Master and the reverend ordinary Council, and explained in the name of the Treasurer General that because of an earthquake on the island of Lango, affecting the localities and settlements of Narangia, Antimachia, Cefalo and Pilli, where there was considerable damage to houses and walls, and death and injury beset both laymen and brothers in these places on the island, it was necessary to provide suitable remedies in order to defend, preserve, uplift and nourish minds and bodies of our subjects in those places, and repair the damage and disaster caused by the earthquake, for which purpose a decision and order of the very reverend Cardinal Grand Master and of the reverend Council is required. It was thus arranged and decided that the triremes which are at the islands of Lero and Calino should go to Lango and provide for their needs, as has been written to the venerable captain, and that the Biscayan caravel should sail to Lango at once, and with it should be sent planks, nails, medicines and suitable assistance, and also that the great ship, duly provisioned, should set sail for the said island, to assist and protect these places and their inhabitants, who have been afflicted and oppressed by the said earthquake disaster, which was not without substantial expense and problems".

Die XXIII mensis octobris M IIII XXXXIII. Coram Reverendissimo domino cardinali et magno magistro ac Reverendo consilio ordinario constituti Reverendi domini magnus preceptor [...] comunis thesaurj exposuerunt nomine ipsius thesaurj generalj propter casum terre motus qui contingit in insula Langonis apud loca et castella Narangie Antimachia Chefali et Pyly ex quo sequita est ruina non parva domorum et murorum ac oppressit morsque confractio [...] hominum tam fratrum quam secularum dictorum locorum insularum fuit necesse providere de remedijs oportunis ad custodiam conservationem sublevacionem et refociliacionem animorum et personarum subditorum dictis in locis constitutorum superstitem et restauracionem ex dictis ruinis et casu terre motus quare st[...] deliberacionem] et ordinacionem Reverendissimi domini cardinalis et magni magistri ac Reverendi consilij fuit provisum et [...] demandatum quod triremes armate quae sunt apud insulas Lorrj et Calamj accedant Lingonem assistantque pro rerum exigencia prout scriptum [?] est venerabilj capitaneo etiam quod caravella

biscayna naviget statim ad Langonum et supra ea mittantur tabule clavi medicine et subvenciones oportune etiam quod grossa navis debite provisa ad dictam insulam naviget ad subvencionem et custodiam dictorum locorum et habitanorum affectorum et oppressorum dicto casu terre motus qui non fuit sine gravj impersa et incomoditate.

The text goes on to describe the administrative duties of the various officials. The second document (Arch. 77, fols.112r.-v.) deals more extensively and in greater detail with the orders given to the ships on 26 October 1493, and the first reconstruction work in the town of Kos:

"On 26 October 1493, there came a messenger who lives on the island of Lango and has citizenship there, with letters and oral messages, and in these letters is set out the very great disaster which befell that place and Antimachia because of an earthquake, begging the very reverend Cardinal Grand Master to send a financial contribution and all necessary help. Therefore, after discussing these matters at length, the following decisions were taken and ordered to be put into effect:

First of all, a caravel to be sent with eight hundred planks in addition to those already sent in these last few days to build shelters for the people of Antimachia who have survived this disaster.

Senior master mason Papantoni [?] also to be sent, together with other masons to repair and rebuild houses in the *castello* of Narangia, and some men to raise the stones, beams and earth in the ruins of the houses in the *castello* of Narangia, so that the said houses can be repaired, and temporary shacks also to be put up in the square at Narangia for people to live in. In addition, the houses for repair and rebuilding to be subdivided as necessary for the people to live in them.

In addition, provision now to be made at Antimachia for dwellings where they now live or in the future will live and reside, either in the original place or elsewhere, because they declare that they do not wish to live on the hill where they lived before.

Provision also to be made for mills, grain and other necessities.

It was also decided that the galleys shall remain at sea along the coast of the said island so that they may succour and assist where necessary, and they shall not leave the area. And the captain to be informed in writing that before the date when he is due to return, namely 17 November, he shall set down in writing what is needed and necessary, and similarly the Biscayan caravel [*bistavia*] which has gone there shall remain until such time as he shall be given other orders.

It was also ordered that the galleon of Raffaele Zura, procurator of the reverend Preceptor of Lango, shall sail to Lango with the above-mentioned provisions, accompanied by the senior master mason and the other items for which provision shall be made, and in addition the said Raffaele shall see to the eight hundred planks and the timber, and the galleon shall remain at Lango with the other vessels in order to perform whatever is necessary.

Furthermore, for the organisation and ordering of these arrangements and repairs as long as is necessary, orders to be given to the reverend Barabino of the Morca, captain of the triremes, representing the reverend Cardinal Grand Master, to go there with the galleon and in the company of the lieutenant of the reverend Preceptor of Lango and the castellan of Antimachia.

It was also agreed that brother Filippo shall be instructed in writing to go there from Lerro and to remain there in order to be of service, and he is not to leave until given other orders. Further, all the above to be communicated in writing to the said reverend captain as representing the reverend Preceptor of Lango.

It was also decided that a great ship shall always be ready to set sail for Lango in order to provide necessities and speed up repairs on the said island to the castles and for our subjects. All the above to be provided for in conformity with the requests and reservations recently made by the reverend Grand Preceptor and the Procurator of the

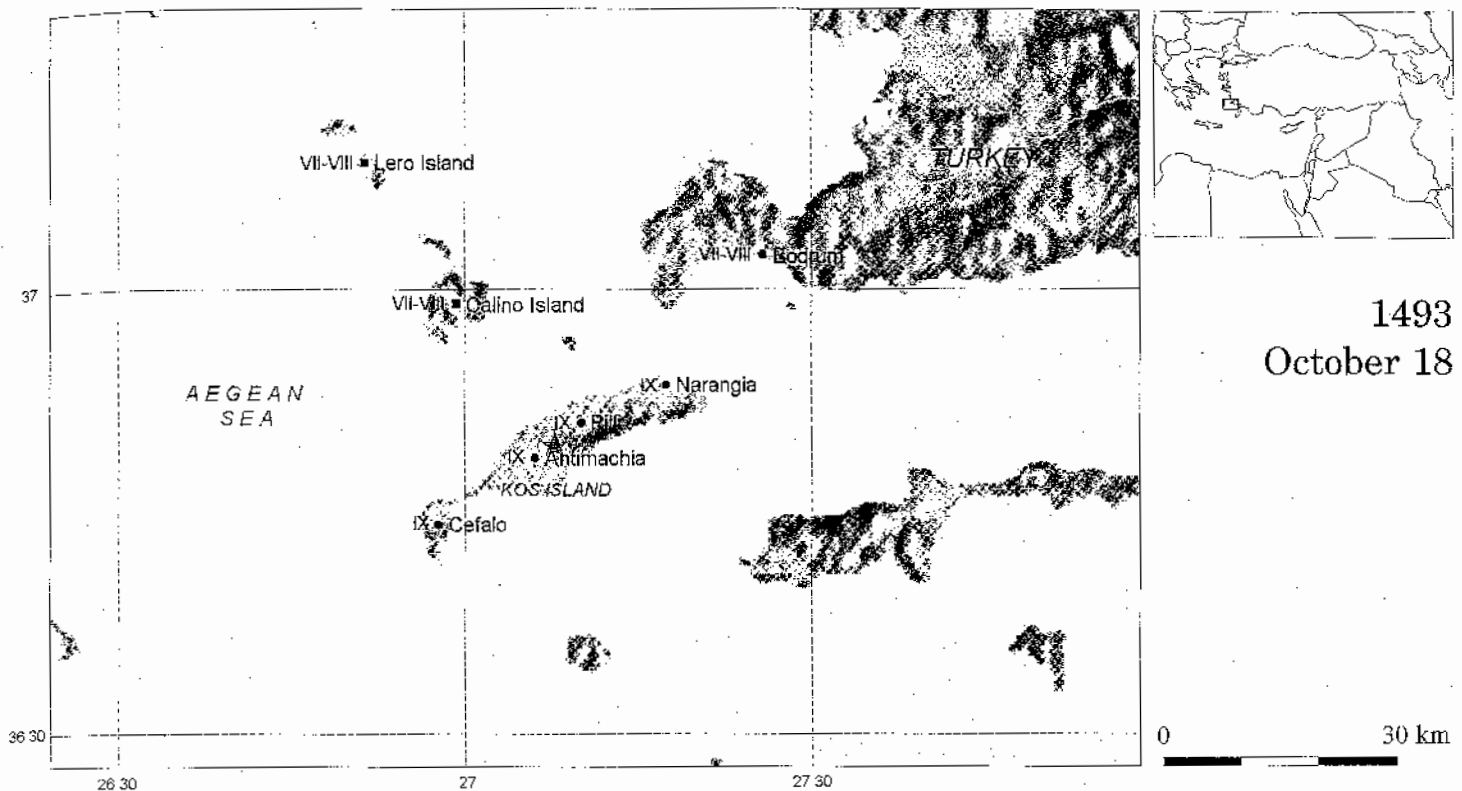


fig. 146

Treasurer General, who is naturally responsible for these costs, or else the Treasurer, or the reverend Preceptor of Lango”.

Die xxvj octobris 1493 venit quidam nuncius habitantem insuli Langonis civis eodem litteris quibus et verbis et eiusdem litteris exponunt iactura que contigit propter terremotum que permagna est in eodem loco et coram [?] in Antimachia supplicantes ut Reverendissimo domino cardinali et magno magistro ut subvencionem mittat et provideat de necessarijs. Itaque his rebus mature consultis fuit ordinatum in sequendo preteritas deliberaciones ut sequitur

Primo mittantur alie viij centum tabule preter illas que misse sunt proximis diebus cum caravella ad faciendj habitacula pro populo Anthimachie qui supra est et remansit ex ipsa iactura.

Item mittantur prothomagister murator de [?] papa Anthonj cum alijs quibusdam muratoribus ad ordinandi et redificandi domos castelli Narangie cum selambus [?] et aliquibus hominibus ad auferendi lapides trabes et terram ruinarum domorum castelli Narangie ut possint reparari dicte domus et quod interim fiant baragie in platea narangie pro habitacione populi. Item quod domus reparande et redificande dividantur prout necessarium fuerit pro populi habitacione.

Item quod provideatur in Antimachia de habitacione homini in presentis loco ubi et in quo loco decetero residebunt et manebunt vel in primo loco aut alio quia asserunt se nole habitare in primo monte ubi habitabant. Item provideatur de molendinis frumento et alijs ad presens necessarijs.

Item fuit deliberatum quod galee remaneant ad mare et littora dicte insule ut succurrant et subveniant in his que sunt necessariis et non distedant et scribatur capitaneo quod ante terminus earum qui erit xvij novembris advenire providebitur scrivendi rerum oportunitatem et occurrencias et per similis caravella bistavia que illuc accessit remaneat quousque illi fuerit ordinatum.

Item fuit ordinatum quod galeonis raphaelis zura procuratoris Reverendi domini preceptoris Langonis vadat et naviget langonem cum dictis provisionibus supra quibus ibunt prothiomagister muratoris et alia de quibus providebunt etiam quod dictus Raphael provideat de tabulis viij centum et legnaminibus quequod galeonis remaneat Langone ad subvenitudo cum alijs.

Preterea ad dirigendi huiusmodi negocia et reparaciones et ordinandi prout necesse est committitur Reverendo domino barabino moree [?] capitaneo tiremini et loco Reverendo domino cardinali et magno magistro [...] illuc vadat cum galeone et locumtenente Reverendi domini preceptoris Langonis atque castellano Anthimachie [...]. Item fuit deliberatum quod scribatur fratri Philippo qui illuc venit ex Lerro ut illic remaneat ad obsequium prestandi nec distedat prousque alium fuerit sibi ordinatum. Item quod supra his omnibus scribantur littere ad dictum Reverendum dominum capitaneum et loco Reverendi domini preceptoris Langonis.

Item supra fuit deliberatum quod grossa navis semper sit parata ut ad Longonem possit navigare faciendi rerum exigencia ad corroborandi reparacionem dicte insule et castellorum ac subditorum. Quibus omnibus provideatur cum protestacione et reservacione his diebus facta per Reverendum dominum magnum preceptorem et procuratorem comunis thesauri cui videlicet dicta impensa incumbit vel thesauro aut Reverendo domino preceptorj Langonis.

In 1497, the town of Kos was visited by Bonsignore Bonsignori, who wrote the following brief description: "[the town of Kos] [...] was completely in ruins as a result of earthquakes: not a single house was left standing; and the Grand Master had already had it completely rebuilt next to the old town".

[...] era tutta per terremotj ruinata: che una casa sola non vi era restata in piedi: et di già il Gran Maestro l'havea rifatta tutta achanto alla vechia.

Heinrich des Frommen von Sachsen visited Kos in 1498, and wrote that the town had been "half swallowed up" about four years earlier. In the history of the Hospitallers written by Giacomo Bosio (1594, II, pp.418-9), there is a skilful summary of the documents preserved in Malta, together with some extra details, such as the day and time when the earthquake occurred:

"In this same year [1493] there was a terrible and frightening earthquake on the island of Lango, which did great harm to religion and to the vassals and inhabitants of the island. What happened was that on 18 October, the day of the feast of the Glorious Evangelist St. Luke, an hour before sunset, the earth shook and trembled with such force and violence that in the town of Narangia and in the *castelli* of Antimachia, otherwise known as Landimachio, Pilli and Cefalo, most houses collapsed, as did part of the walls and fortresses, killing some knights and many men, women and children, for they were suddenly trapped in the ruins of the houses; and many were also injured and crippled. The lieutenant of the bailiff of Lango immediately informed the Cardinal Grand Master about this, asking for succour, aid and comfort for the poor vassals, who were all frightened, dismayed and dumbfounded. The Grand Master and Council therefore immediately sent orders to the Bailiff of the Morea, the Captain of the Galleys, who was at sea off Lero, that he should go to Lango at once; and that once he reached the Narangia area, he should use the ships' crews and any other assistance possible to provide every aid and comfort to those people".

Occorse in questo medesimo anno nell'isola di Langò un horrendo e spaventevole terremoto; il quale fu molto dannoso alla religione e a' poveri vassalli et abitanti di quell'isola. Percioché a 18 di Ottobre, giorno del glorioso Evangelista san Luca, un'ora inanzi al tramontar del sole, si scosse e tremò la terra con tanto impeto e con tanta violenza che nella Terra di Narangia e nelle castella d'Antimachia, o sia di Landimachio, di Pilli e di Cefalò rovinò la maggior parte delle case, e parte delle

muraglie e delle fortezze, ammazzando alcuni cavalieri e molti huomini, molte donne e molti fanciulli, ché improvvisamente sotto le rovine delle case colti furono; e molti anco feriti e stroppiati ne rimasero. Del qual infelice successo, il Luogotenente del Baglivo di Langò ne diede subito avviso al Cardinal Gran Maestro, domandando soccorso e qualche aiuto e consolazione a' poveri vassalli, i quali erano tutti atterriti, sbigottiti et attoniti. Perilché fu subito d'ordine del Gran Maestro e del Consiglio spedito un commandamento al Baglivo della Morea, Capitano delle Galere, il quale si trovava ne' mari di Lerro, che subito andar dovesse a Langò; e che sorgendo sotto Narangia, con le ciurme di dette galere, e con ogni altro soccorso, che possibile gli fosse, procurar dovesse di dare ogni aiuto e consolazione a quei popoli.

Bosio goes on to provide many details about the aid that was provided, the religious processions that were held in Rhodes, and the fact that the disaster was on the point of causing the inhabitants of Kos to leave the island. They were only dissuaded from doing so by the repeated aid afforded to them. Luttrell (1986) sheds light on a misunderstanding which led to the supposed occurrence of another earthquake at Kos on 5 August 1493. It resulted from an error made by a 17th century scholar in copying Bosio. Schmidt (1881, p.157) wrongly dates the earthquake to 18 October 1483; the wrong date is also found in Sieberg (1932a, p.59), Shebalin *et al.* (1974) and Papazachos and Papazachou (1997, p.197), who give 18 August 1493.

▲ 1493 10 18 14:30 UT ☉ = 36 49 27 08 $I_0 = IX$ $M_c = 6.5$ Sites: 7

localities	lat.	long.	I	localities	lat.	long.	I
Andimakhia GR	36 49	27 06	IX	Bodrum TR	37 02	27 26	VII-VIII
Kefalos CR	36 44	26 58	IX	■ Kalimmos island CR	36 59	26 59	VII-VIII
Kos GR	36 54	27 17	IX	■ Leros island GR	37 08	26 51	VII-VIII
Pylion GR	36 51	27 10	IX				

< 377 > 1494 May 29 Messina [Sicily, Italy]

source 2 Maurolico, *Sicanicarum*, p.32v.

historiography Buonfiglio Costanzo (1604); Samperi (1644); Pirri (1733); Spanò Bolani (1857); Gallo (1877-82); Trasselli (1972); Agnello (1992); Fallico and Sparti (1994); Fulci (1994)

catalogues d. Mongitore (1743); Mercalli (1883; 1897); Baratta (1895, 1901); De Stefano (1987); *Boschi *et al.* (1997, 2000)

catalogues p. Giorgetti and Iaccarino (1971); Carrozzo *et al.* (1973); Postpischl (1985); CPTI (1999)

During the night of 28-29 May 1494 between about 1:50 and 2:50 UT (between the seventh and eighth hours of the night, "Italian time") a sequence of strong earthquakes struck the city of Messina, causing the collapse of some house roofs, the upper part of the southern gate of the city, called the *Porta di Giano* or *di S. Antonio*, and a section of the city walls on the north side. There were no victims.

At the time of the earthquake, Messina stood within a surrounding wall bounded by the sea to the east, the slopes of the Monti Peloritani to the west, and the two streams called Boccetta and Portalegni to the north and south respectively. The urban layout had taken form and become established during the period of Byzantine and Arab domination. In the closing years of the 15th century, and until new work was carried out in the mid-16th century, city buildings had suffered serious decay.

The earthquake is mentioned for the first time in a work dating to a few decades later, namely the *Sicanarum Rerum Compendium* by Maurolico (1562). This reliable work does not describe the effects in detail. A great many medieval sources for Messina have been destroyed or are now missing as a result of earthquakes — especially those

of 1783 and 1908. Maurolico simply tells us: "In the year of grace 1494, in the month of May [...], many strong earthquakes struck Messina".

"Anno salutis 1494. mense Majo [...] et magni Terraemotus Messanam vexarunt.

Later erudite historiography provides more detailed information about effects. The *Historia Siciliana* by the scholar Buonfiglio Costanzo (1604) tells us in general terms that the 1494 earthquakes caused damage to buildings, but provides no further details. The most detailed information appears in the *Iconologia della gloriosa Vergine Madre di Dio...* by Samperi (1644), an even later work, which relies on sources now lost. It is Samperi in fact who tells of damage in Messina: to the roofs of some houses, to the southern gate, and to a stretch of northern city wall.

Information from Maurolico and Samperi was taken up by Mongitore (1743), who was the source used by Baratta (1901). The latter amplified what he obtained from Mongitore with information from Gallo (1877-1882).

▲	1494 05 29	1:50-2:50 UT		
localities	lat.	long.		I
Messina	38 11	15 33		VII-VIII

< 378 > 1494 July 1 10:10 UT Crete island ▷ tsunami ◁ [Greece]

< 379 > 1494 July 1 21:10 UT Candia

source	Casola, <i>Viaggio</i> , pp.40-1
historiography	Thevet (1554-56); Olivier (1801)
catalogues d.	Perrey (1850); Sieberg (1932a); Plataki (1950); Ben-Menabem (1979); *Papazachos and Papazachou (1997)
catalogues p.	Shebabin <i>et al.</i> (1974); Galanopoulos (1981); Papadopoulos and Chalkis (1984); Papazachos <i>et al.</i> (1986); Bektur and Alpay (1988)
catalogues Ts	Ambraseys (1962); Antonopoulos (1980); Soloviev <i>et al.</i> (2000)

hours 10:10 UT On the first July, at about the sixteenth hour ("Italian time"), a strong and prolonged earthquake struck the island of Crete. At Candia, the capital of the island (now Iraklion), the shock caused severe damage to bell-towers, churches and houses. The convent and church of San Francesco were amongst the buildings damaged, the convent beams being almost pulled out of their framework. Some unspecified places on the island were violently shaken and damaged. The earthquake caused a tsunami in the harbour at Candia, increasing the rough seas (which had already been disturbed in a preceding storm). All the ships at anchor struck violently against one another, to the extent that they seemed likely to break up.

hours 21:10 UT At about the third hour of the night ("Italian time") on that same day, July 1, there was another shock, which caused the people of Candia to flee from their houses and take refuge in the open air.

On the day of the earthquake itself, a procession led by the Latin and Greek clergy was immediately organised, and repeated the next day as well.

Information about this earthquake is to be found in the diary of Pietro Casola (published in 1855 by Porro), a Milanese priest who went on a pilgrimage to Jerusalem in 1494 together with a friar called Francesco Trivulzio. Their journey began on 15 May in Milan. When they reached Venice, the pilgrims embarked on a ship which called at various Adriatic and Mediterranean ports. They disembarked at Candia on 1 July — the very day of the earthquake. Casola's diary records as follows:

"On Tuesday, the first day of July, at dawn, as the sea had somewhat calmed down [...] We finally entered the desired port of Candia [...] about the sixteenth hour, there was an earthquake of such a nature, that I was almost thrown to the ground from the seat on which I was sitting. The friary [S.Francesco] seemed on the point of falling, the beams were seen to come out of their places, and made a great dust; and the friars cried aloud "Misericordia", as did the others who were in the convent. I desired to flee with the rest, but it was impossible; on the one side were the convent and the church, from which came clouds of dust, and on the other side were the walls of the city, from which we could fall headlong and break our necks. There were dangers on every side, and we thought to have escaped the sea only to perish on land. [...] The said earthquake did much damage in the city to the bell-towers and churches, and to private houses as well. [...] It was said that there had been other earthquakes, but they had not lasted as long or been as terrible as this one. Everyone was terrified, visitors as much as local people. And when I returned to the galley because I was afraid, I found another thing which greatly alarmed everyone. For the sea was stormier than when we had landed, and raged so much that it dashed all the ships in the port against one another, so that it seemed as if they would all be broken to pieces; [...] At about the third hour of the night the earthquake was renewed with such violence that people rose from their beds and fled into the open. It was said that letters were brought to the governors of the city from several places in the island which were reduced to ruins by this earthquake. On Wednesday 2 July, I left the galley to go and see the city of Candia, and I happened to see the beginning of the procession made in consequence of the earthquake".

Martedì al primo de Julio in l'aurora, siendo alquanto chetato el mare [...] gionsemo al desiderato porto de Candia [...] cerca a le XVI hore levossi uno terremoto de tal natura, che stando a sedere me fece quasi gitare a terra; ita ch'el pariva cascasse el monastero, e vedevasi le travi che pariva uscisseno de loco e facevano grande polvere; e cridavano li frati misericordia, e così altri che erano in el monastero: desiderava in se ma con li altri de fugir, e non gli era el modo: da uno lato el monastero e la Giesia che gitaveno polvere, de l'altro lato erano le mura de la città, unde se potevano gitare in precipizio e romperse el collo. Da ogni lato erano le angustie, e credevamo esser fugiti dal mare per morire in terra. [...] Fece dicto terremoto grande danno in la città, in campanili, in Giesie et anche in case private. [...] Dicevasi esser stato altre volte, ma non così terribile e longho. Staveno tutti sbigottiti così li forestieri quanto li terreri. E tornando io a la Galea per paura, trovai un'altra cosa che induceva grande terrore a la brigata. Nam el mare era montato in majore furia che non era quando el lassassemo, et era tanto corrucciato, ch'el urtava tutti li navillii erano in porto, e l'uno contro l'altro, ch'el pariva li volesse spezare tutti. [...] cerca le tre hore de note renovossi dicto terremoto, e talmente che se levarono le brigate fora del lecto e fugirono a la larga. Dicesi esser portate littere a li rectori di questa citade de alcuni loghi sono fracassati in la insula per questo terremoto. El Mercore a II de Julio smontai de Galea per andar a vedere questa città de Candia, et me incontrai a vedere el principio de la processione inducta a fare per questo terremoto.

Casola remained at Candia for one more day, setting sail for Rhodes at dawn on 4 July. The frequency and violence with which earthquakes struck Crete had caused the inhabitants to build their houses in a special way. According to André Thevet (1554-56, pp.41-2), a French monk, traveller and cosmographer, houses were first appropriately built in solid stone with vaulting and arches, and then covered with stones to provide a platform. The inhabitants said that in this way they reinforced their buildings against earthquakes. According to Thevet, they had learned this technique from Pliny. The catalogues of Perrey (1850, p.20), Plataki (1950, p.476) and Sieberg (1932a, p.208), all of which derive from Thevet (1554-56, pp.41-2), and Olivier (1801, I, p.384), wrongly date the earthquake to 1490.



1494 07 01 10:10 UT Ts

localities	lat.	long.	I	localities	lat.	long.	I
■ Crete island	35 12	24 55	VIII-IX Ts	Iraklion	35 20	25 09	VIII

1494 07 01 21:10 UT

localities	lat.	long.	I
Iraklion	35 20	25 09	V

< 380 > **1496 November 28 Ragusa [Croatia]**

source Razzi, *La storia*, p.68

literature Albini (2004)

catalogues d. Kispatic (1891-92)

Although this earthquake is listed in Kispatic's catalogue (1891-92), it does not appear in current parametric catalogues.

On 28 November 1496, at about 8:45 UT (the seventeenth hour, "Italian time"), there was a sufficiently powerful earthquake at Ragusa (present-day Dubrovnik) for the nobles who were then holding a general council meeting to think that the building in which they were meeting would collapse. That did not happen, but there were some unspecified effects, probably not of a serious nature. Evidence for the earthquake is provided by Serafino Razzi, an Italian monk who was a native of Lucca but spent many years in Ragusa in the 16th century, gathering information *in loco*, and writing a history of the city. Razzi's text (1595, p.68) reads as follows:

"In the year 1496, on 28 November, at the seventeenth hour, when the general council was meeting in the Palazzo, there was so powerful an earthquake that they thought the Palazzo would collapse and that all the nobility would perish. But, thanks be to God, there were no such evil consequences".

Dell'anno 1496 alli 28. di Novembre, à hore 17. essendo congregato il Consiglio generale in Palazzo, venne un così fatto terremoto, che dubitarono non rouinasse il Palazzo, e che non morisse tutta la nobiltà. Ma Dio grazia non seguì tanto male.

The source does not specify the earthquake effects, but the expression "there were no such evil consequences" seems to be a clear indication that damage did indeed occur, though it was probably only slight. The statement that the effects of the earthquake were not very serious ("...no such evil..."), compared to the expectation that the building might collapse, indicates that at least some damage was caused. Albini (2004, p.687) provides the text of the source for this earthquake, but not intensity estimate.



1496 11 28 8:45 UT

localities	lat.	long.	I
Dubrovnik	42 40	18 07	V-VI

< 381 > **1497 March 3 Lunigiana [Tuscany, Italy]**

source Zambotti, *Diario ferr.*, p.272

historiography Branchi (1897-98)

This earthquake is unknown to the tradition of seismological studies and to current catalogues. It occurred on 3 March 1497, striking the area of Lunigiana in the river

Magra basin in the northernmost part of Tuscany, on the border with western Emilia and eastern Liguria. Numerous houses and three castles collapsed, killing a large number of people. The fact that the area was close to the Garfagnana region, which belonged to the dukes of Ferrara, explains how news of the earthquake reached Ferrara in spite of its being about 150 km away.

The source is Bernardino Zambotti's *Diario ferrarese*, which covers the period 1476-1504, and deals with daily events of his own time. Zambotti belonged to a wealthy Ferrarese family and held many public positions, in addition to teaching at the University of Ferrara. In the present state of research it is possible to make only a limited number of observations about the affected area. Zambotti records that the earthquake occurred in the lands of marquis "Spineta" — who may perhaps be identified as Gian Spinetta Malaspina (d. 1528). The feudal situation in Lunigiana towards the end of the 15th century was very complicated because of the substantial breakup of the original family estates. This makes identification difficult (see Branchi 1897-1898). Zambotti's text is as follows:

"Friday 3 March [1497]. There was a very large earthquake in the lands of marquis Spineta, where many houses and three castles collapsed, and many people were killed as a result of properties and houses collapsing in the earthquake".

Marzo, a dì 3 de vegneri. Trette uno grandissimo terramoto in le terre de lo marchexe Spineta, dove roinòno molte case e 3 castelle, e se amazòno molte persone per terre e case che ruinòno per dicto terramoto.

March 3 was indeed a Friday in 1497. Gian Spinetta Malaspina was marquis of Licciana, Bastia, Podenzana and Terrarossa, all of which are located in the valley of the river Taverone, a tributary of the Magra on its left.

▲ 1497 03 03

localities	lat.	long.	I
■ Lunigiana	44 15	09 55	VIII-IX

< 382 > 1497 November 11 or December 10 Nicosia? [Cyprus]

source *Notula* in Darrouzès (1956, p.57)

historiography Darrouzès (1956)

This earthquake is unknown to the seismic catalogue tradition.

A rather obscure *Notula* in manuscript *graecus* 2316, fol.182 in the Biblioteca Apostolica Vaticana (published in Darrouzès 1956, p.57) records:

"During today, 15 of St.Menas, in the year 1497 since the birth of Christ, there was shaking...".

Κατὰ τῆ(ν) σήμερο(ν) ἡμέρα(ν), ὅπου εἶνι ἐ' τοῦ ἀγίου Μην(ᾶ), ἐχρονία(ς), αὐρ(ς) Χ(ριστο)ῦ ἐτζακίστε (ἡ χώρα γῆ εἰς Παλούρης).

On the basis of one of the preceding *Notulae* (fol.179), which mentions the church of St.Michael at Kythrea, Darrouzès (1956, p.57) has expressed the view that the earthquake occurred at a time when the manuscript, which is a liturgical work, was in that church. The page containing the text of the *Notula* is, however, in poor condition. Darrouzès thinks the place names Lefkosia and Paliouriotissa can be read in the final phrase. He evidently had in mind the well-known female monastery of the Theotokos Paliouriotissa at Lefkosia. However, the words "εἰς Παλούρης" may well refer to Palloura, a locality near Lefkosia.

The exact chronology of this earthquake is uncertain, because the feast of the

Athenian St.Menas is on 10 December, while that of the Egyptian St.Menas is on 11 November.

△ There are no elements with which to indicate the parameters.

< 383 > 1498 September 18 – October 16 [*Safar* 904 H.] Cairo [Egypt]

source Ibn Iyas, *Bada'i*, III, p.399

catalogues d. *Ambraseys *et al.* (1994)

There was a minor earthquake at Cairo between 18 September and 16 October 1498. The earthquake was interpreted as an ill omen for sultan Nasir al-Din Muhammad, who was murdered shortly afterwards, on 31 October of that year. Information about the earthquake can be found in one source only, namely the contemporary Arab historian Ibn Iyas: "In that month [*Safar* = 18 September – 16 October], there was a minor earthquake shock at new Cairo, which was an ill omen for the sultan, and indeed he was murdered immediately after that event".

و فيه وقعت زلزلة خفيفة بالقاهرة، و كانت فألا على السلطان، فإنه قتل عقيب ذلك

Ambraseys *et al.* (1994, p.102) give it an epicentral intensity of class F, which is equivalent in their classification to a range from felt to strong (up to grade VI MSK).

It is likely that these are felt effects from a distant and so far unidentified epicentre. The chronological indicator may act as a guide for further research.

▲ 1498 09 18 – 10 16 [*Safar* 904 H.]

localities	lat.	long.	I
Cairo	30 03	31 15	V

Short Catalogue and Maps

Listed below are the parameters attributed to 383 events, corresponding to the individual entries in the catalogue. The epicentres and magnitudes have been calculated only if the underlying historical information relates to at least four localities. Wherever such information is missing, an epicentral area has been suggested for a few special cases (see texts); in all other cases, only the maximum intensity is given. The Mercalli Cancani Sieberg (MCS) scale has been used. Since the historical data are provided, there seems to be little point in discussing the choice of scale, for any catalogue compiler can reinterpret the descriptive data provided here (they are the true results of our historical research and interpretations). We suggest that this short catalogue should be used in close and critical relation to the corresponding entries in the main catalogue. In our opinion, the parameters are a stage in interpretation which is open to discussion and may be improved upon by adopting other approaches, which may even differ from one Country to another (well-applied attenuation laws, more accurate intensity of effects estimates etc.). In other words, this Short Catalogue should be used as an "index" of the various earthquakes and tsunamis analysed.

For the sake of simplicity, we have adopted certain conventions for data in the entries:

- dates: for time-spans (years, days or hours) only the first term is given;
 - capital letters after the name of a locality indicate the Country to which it belongs (see the list in the Legend);
 - (): estimated intensity grades, when the historical information applies to the effects on a single building (see Legend);
 - italics: doubtful events or unidentified locality;
 - bold: earthquake or tsunamis not known in the catalogues in use;
 - G: (generic) environmental effects and tsunamis described but not localised.
- For other symbols used, see the Legend.

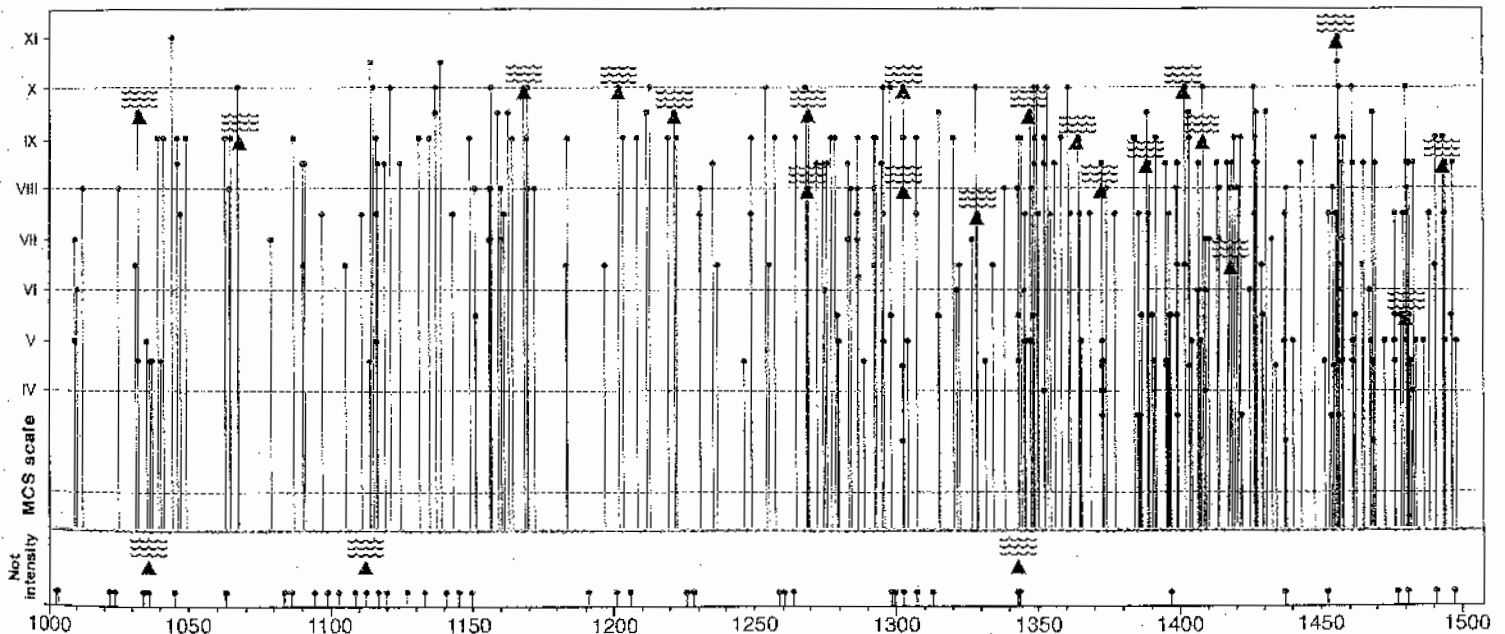


fig. 147 Summary chart of the earthquakes and tsunamis analysed in this Catalogue: 383 earthquakes, of which 231 are above the damage threshold; 50 are unknown to current catalogues; 48 earthquakes without parameters (below, in grey); 22 tsunamis, of which 2 are unknown to current catalogues; 2 are not linked to known earthquakes.

Num	Date	Time U.T.	Epicentral area	Locality	Lat	Lon	Io	Imax	Me	Sites	EE	Ts
(001)	1002-1003	-	-	Syria	-	-	-	-	-	-	-	-
(002)	1003-1004	-	-	Edessa area TR	-	-	-	-	-	-	-	-
(003)	1010 01 -	-	-	Istanbul TR	41 02	28 57	-	V	-	1	-	-
(004)	1010 03 09	-	-	Istanbul TR	41 02	28 57	-	VII	-	1	-	-
(005)	1011 --	-	-	Erzinkan TR	39 44	39 30	-	VI	-	1	-	-
(006)	1013-1014	-	-	Halbat TR	41 06	44 43	-	(VIII)	-	2	-	-
(007)	1022 08? -	-	-	Melitene area? TR	-	-	-	-	-	-	-	-
(008)	1024-1025	-	-	Andalucia E	-	-	-	-	-	-	-	-
(009)	1026 12 04	-	-	Istanbul TR	41 02	28 57	-	VIII	-	1	-	-
(010)	1032 08 13	17:45	-	Istanbul TR	41 02	28 57	-	VI-VII	-	1	-	-
(011)	1033 03 06	07:15	-	Istanbul TR	41 02	28 57	-	F	-	1	-	-
(012)	1033 12 05	night	Israeli-Palest. area	-	32 00	35 12	IX	IX-X	6.0	11	1	1
(013)	1034-1035	-	-	North. Anatolia TR	-	-	-	-	-	-	G	-
(014)	1036-1037	-	-	Cilicia? TR	-	-	-	-	-	-	G	G
(015)	1036 12 18	19:30	-	Istanbul TR	41 02	28 57	-	V	-	1	-	-
(016)	1037 11 02	13:00	-	Istanbul? TR	41 02	28 57	-	F	-	1	-	-
(017)	1038-1039	-	-	Istanbul? TR	41 02	28 57	-	F	-	1	-	-
(018)	1040 02 02	-	-	Smyrna TR	38 25	27 09	-	IX	-	2	-	-
(019)	1041 06 10	17:45	-	Istanbul? TR	41 02	28 57	-	F	-	1	-	-
(020)	1041-1042	-	-	Istanbul? TR	41 02	28 57	-	F	-	1	-	-
(021)	1042-1043	-	-	Tadmur SYR	34 33	38 17	-	IX	-	2	-	-
(022)	1045 02 01	-	-	Melitene area? TR	-	-	-	-	-	-	G?	-
(023)	1045 --	-	-	Erzinkan TR	39 44	39 30	-	XI	-	2	G	-
(024)	1046-1047	-	-	Diyarbakir TR	37 55	40 14	-	IX	-	2	-	-
(025)	1046 11 09	-	Middle Adige Val.	-	45 54	11 01	IX?	VIII-IX	-	1	-	-
(026)	1048-1049	-	-	Orihuela E	38 05	-00 57	-	VII-VIII	-	2	G	-
(027)	1050 08 05	-	-	Çankiri TR	40 35	33 37	-	IX	-	2	G	-
(028)	1063 07 30	-	Tripoli RL	-	34 24	35 36	VIII	IX	5.6	4	-	-
(029)	1063 09 23	night	Sea of Marmara	-	40 52	27 24	IX	IX	6.0	5	-	-
(030)	1063-1065 c.	-	-	Istanbul TR	-	-	-	-	-	-	-	-
(031)	1065 03 27	morning	-	Brescia I	45 33	10 13	-	VIII	-	2	-	-
(032)	1065 c. 09 -	-	-	Iznik TR	40 27	29 43	-	IX	-	1	-	-
(033)	1068 03 18	06:30	Eilat IL	-	29 33	34 57	IX	X	8.1	13	2	-
(034)	1068 05 29	-	Ramla IL	-	32 34	35 17	IX	X	6.0	4	1	G
(035)	1079 09 01	night	-	Seville E	37 23	-05 59	-	VII	-	1	-	-
(036)	1083 08 18	-	-	Maghreb	-	-	-	-	-	-	-	-
(037)	1086-1087	-	-	Syria	-	-	-	-	-	-	-	-
(038)	1087 09 10	-	-	Apulia I	41 15	16 00	-	IX	-	2	-	-
(039)	1090 12 06	10:00	-	Istanbul TR	41 02	28 57	-	VIII-IX	-	1	-	-
(040)	1091 01 27-28	-	-	Rome I	41 54	12 29	-	VI-VII?	-	1	-	-
(041)	1091 09 26	-	-	Antioch TR	36 14	36 07	-	VIII-IX	-	2	-	-
(042)	1094 05 19	-	-	Syria	-	-	-	-	-	-	-	-
(043)	1097 12 30	-	-	Antioch area TR	36 14	36 07	-	VII-VIII?	-	2	G	-
(044)	1099 c.	-	-	Istanbul TR	-	-	-	-	-	-	-	-
(045)	1103 02 -	-	-	Melitene area TR	-	-	-	-	-	-	-	-
(046)	1105 12 24	-	-	Jerusalem IL	31 46	35 14	-	VI-VII?	-	1	-	-
(047)	1108 09	-	-	Melitene area? TR	-	-	-	-	-	-	-	-
(048)	1111 08 31	08:30	-	Cairo FR	30 03	31 15	-	VII-VIII?	-	1	-	-
(049)	1112 06 20	-	-	Tyrrhenian Sea I	-	-	-	-	-	-	-	1
(050)	1114 08 10	-	-	Jerusalem IL	31 46	35 14	-	F	-	1	-	-
(051)	1114 11 13	-	Maras TR	-	37 24	37 40	X	X-XI	6.3	11	1	-

Num	Date	Time U.T.	Epicentral area	Locality	Lat	Lon	Io	Imax	Me	Sites	EE	Ts
(052)	1115 11 29	-	Yakapinar	TR	-	37 17	36 16	X	X	6.3	5	-
(053)	1117 01 03	night	Southern Germany	see text	-	-	-	-	-	-	-	-
(054)	1117 01 03	15:15	Verona	I	-	45 22	11 10	IX	IX	7.0	57	G
(055)	1117 01 03	15:15	Tuscany	I	-	44 05	10 27	VII-VIII	VII-VIII	-	5	-
(056)	1117 - 1118	-	-	Marmet	TR	38 39	43 14	-	V	-	1	-
(057)	1117 06 26	night	-	Scandelion	RL	33 08	35 10	-	VIII-IX	-	1	-
(058)	1120 01 01	-	-	Melitene area?	TR	-	-	-	-	-	-	-
(059)	1120 - 1121	-	Latium	I	-	41 22	13 55	VIII-IX	VIII-IX	5.8	4	-
(060)	1121 12 18	-	-	Samah	TR	38 30	37 50	-	X	-	1	1
(061)	1125 06 07	11:00	-	Syracuse	I	37 05	15 17	-	VIII-IX	-	-	-
(062)	1127 02 -	-	-	Melitene area?	TR	-	-	-	-	-	-	-
(063)	1131 11 28	-	-	Ani	TR	40 32	43 34	-	IX ?	-	1	-
(064)	1133 02 03	-	-	Melitene area?	TR	-	-	-	-	-	-	-
(065)	1136 09 23	-	-	Tolatap'	TR	39 40	41 44	-	IX	-	1	-
(066)	1137 10 19	-	-	south-east, Turkey		37 17	41 44	-	IX-X	-	1	-
(067)	1138 10 11	-	Mount Quroso	SYR	-	36 43	36 56	IX	X	6.0	11	1
(068)	1139 09 30	night	Ganca	AZ	-	40 24	46 14	X	X-XI	6.3	5	2
(069)	1140 10 29	-	-	Melitene area?	TR	-	-	-	-	-	-	-
(070)	1143 11 26	-	-	Bursa	TR	40 11	29 04	-	VII-VIII	-	1	-
(071)	1145 05 24	-	-	Melitene area?	TR	-	-	-	-	-	-	-
(072)	1149 12 29	-	-	Melitene area?	TR	-	-	-	-	-	-	-
(073)	1150 c.	-	-	Qasr al-Yahud	WS	31 50	35 31	-	(IX)	-	2	-
(074)	1161 09 28	night	-	Busra ash Sham	SYR	32 31	36 29	-	VIII	-	2	-
(075)	1162 02 01	04:00	-	Busra ash Sham	SYR	32 31	36 29	-	V-VI?	-	2	-
(076)	1156 10 13	-	Afamiyah	SYR	-	35 25	38 24	VI	VII	4.9	4	-
(077)	1156 12 09	-	Aleppo	SYR	-	36 14	37 10	VII	VIII	5.3	5	-
(078)	1157 04 02	-	Afamiyah	SYR	-	35 24	36 38	VII	VII	5.8	6	-
(079)	1157 07 05	-	Afamiyah	SYR	-	35 12	36 37	VIII	VIII	6.8	6	-
(080)	1157 08 09	-	-	Tall Harran	SYR	36 07	37 20	c.e.	X	-	20	2
(081)	1160 10 15	-	-	Subiaco	I	41 55	13 06	-	(VIII)	-	2	-
(082)	1161 01 16	-	-	Ceccano	I	41 34	13 20	-	VII ?	-	1	-
(083)	1160 c./1165	-	-	Paphos	CY	34 43	32 34	-	(IX)	-	1	1
(084)	1162	-	-	Istanbul	TR	41 02	28 57	-	VII-VIII	-	1	-
(085)	1163 08 -	-	-	Antioch	TR	36 14	36 07	-	IX-X	-	2	G
(086)	1165 c. - 1167	-	-	Erzincan	TR	39 44	39 30	-	IX	-	1	-
(087)	1169 02 04	07:00	-	Eastern Sicily	I	37 13	14 57	X	X	6.3	8	3 2
(088)	1170 05 09	-	-	Ceccano	I	41 34	13 20	-	VIII	-	1	-
(089)	1170 06 29	03:45	Syria-Lebanon		-	34 39	36 11	X	X	7.7	29	-
(090)	1170 - 1171	-	-	Cordoba	E	37 53	-04 46	-	IX	-	1	1
(091)	1172 09 26	13:40	-	Messina	I	38 11	15 33	-	VIII	-	1	-
(092)	1183 12 ? -	-	-	Verona	I	45 26	11 00	-	VI-VII ?	-	1	-
(093)	1184 05 24	-	Crati Valley	I	-	39 24	16 12	IX	IX	6.0	6	-
(094)	1191 - 1192	-	-	Egypt		-	-	-	-	-	-	-
(095)	1197 b. 07	-	-	Istanbul	TR	41 02	28 57	-	(VI-VII)	-	1	-
(096)	1201 02 17	-	-	Istanbul	TR	-	-	-	-	-	-	-
(097)	1202 05 20	02:40	Syria-Lebanon		-	33 26	35 43	X	X	7.6	30	1 1
(098)	1204 - 1236	-	-	Verona	GR	40 31	22 12	-	IX	-	1	-
(099)	1206 - 1207	-	-	Erzincan	TR	39 44	39 30	-	NC	-	1	-
(100)	1209 - -	-	-	Chieti diocese	I	42 10	14 00	-	IX	-	2	-
(101)	1212 05 01	-	-	Elat	IL	29 33	34 57	VIII-IX	IX-X	5.8	4	-
(102)	1213 06 22	-	-	Isauria	TR	37 15	32 20	-	X	-	2	G

Num	Date	Time U.T.	Epicentral area	Locality	Lat	Lon	Io	I _{max}	Me	Sites	EE	T _s
(103)	1220 01 11	-	-	Mshakavank' AM	41 12	45 00	-	(IX)	-	1	-	-
(104)	1222 05 11	06:15	Cyprus cv	-	34 42	32 48	IX	IX-X	6.0	3	G	2
(105)	1222 12 25	11:30	Brescia area I	-	45 29	10 14	VIII	IX	6.2	20	-	-
(106)	1226 - 1227	-	-	Armenia	-	-	-	-	-	-	-	-
(107)	1228 07 -	-	-	Ischia island I	-	-	-	-	-	-	-	-
(108)	1231 03 11	-	-	Istanbul TR	41 02	28 57	-	VII-VIII	-	1	-	-
(109)	1231 06 01	11:00	-	Cassino I	41 29	13 50	-	VIII	-	3	1	-
(110)	1236 - 1237	-	-	Erzincan TR	39 44	39 30	-	VIII-IX ?	-	1	-	-
(111)	1237 09 16	-	-	Istanbul? TR	41 02	28 57	-	VI-VII ?	-	1	-	-
(112)	1247 spring	-	-	Corfu TR	41 09	27 48	-	F	-	1	-	-
(113)	1249 09 -	-	-	Modena I	44 39	10 56	-	VII-VIII	-	2	-	-
(114)	1250 c. - 1260 ?	-	-	Galaxidhion GR	38 23	22 23	-	IX ?	-	1	-	-
(115)	1254 10 11	-	-	Erzincan TR	39 44	39 30	-	X ?	-	2	1	-
(116)	1255 11 17/1256	10:00	-	Messina I	38 11	15 33	-	VI-VII ?	-	1	-	-
(117)	1258 02 19	-	-	Barrea I	41 45	13 59	-	(IX)	-	2	-	-
(118)	1258 - 1259	-	-	Cairo ET	30 03	31 15	-	NC	-	1	-	-
(119)	1259 03 22	night	-	Damascus SYR	33 30	36 19	-	NC	-	1	-	-
(120)	1261 - 1262	-	-	Syria	-	-	-	-	-	-	-	-
(121)	1264 02 20	-	-	Egypt	-	-	-	-	-	-	-	-
(122)	1265 08 -	-	-	Marmara (island) TR	40 38	27 37	-	IX ?	-	1	1	-
(123)	1269 04 17	17:00	-	Cilicia TR	37 01	36 21	X	X	6.3	7	-	-
(124)	1269 09	-	-	Ancona I	43 36	13 30	-	VIII	-	2	1	1
(125)	1270 --	-	-	Sansepolcro I	43 34	12 08	-	VIII	-	1	-	-
(126)	1270 03 --	-	-	Durrës AL	41 18	19 28	-	IX-X	-	1	-	1
(127)	1273	-	-	Potenza I	40 38	15 48	-	VIII-IX	-	1	-	-
(128)	1275 10 03	-	Ercis TR	-	38 53	42 55	IX	X	6.0	6	-	-
(129)	1275 b.	-	-	Ischia island I	40 44	13 57	-	VIII-IX	-	1	1	-
(130)	1276 05 22-25	-	-	Orvieto I	42 43	12 07	c.e.	VIII-IX	-	2	G	-
(131)	1278 02 25	-	-	Corfu GR	39 37	19 55	-	IX	-	1	-	-
(132)	1279 04 30	14:00	Umbria-Marche I	-	43 06	11 46	IX	IX	6.2	14	1	-
(133)	1279 05 01	02:00	Romagna Ap. I	-	44 02	11 47	VIII	VIII-IX	6.2	5	-	-
(134)	1280 - 1281	-	-	Erzincan TR	39 44	39 30	-	V-VI	-	1	-	-
(135)	1280 07 12	-	-	Mount Kayis TR	40 59	29 09	-	V	-	1	-	-
(136)	1284 01 17	15:30	-	Venice I	45 26	12 20	-	VII	-	2	-	-
(137)	1284 10 13	-	-	Damascus SYR	33 30	36 19	-	VIII ?	-	1	-	-
(138)	1284 - 1285	-	-	Borsum Kalesi TR	38 00	38 35	-	VIII-IX	-	2	-	-
(139)	1287 02 -	-	-	Hims SYR	34 44	36 43	-	VII-VIII	-	2	-	-
(140)	1287 03 08	-	-	Hims SYR	34 44	36 43	-	VII ?	-	1	-	-
(141)	1287 03 22	-	-	Al-Ladhiqiya SYR	35 31	35 47	-	VIII	-	1	-	-
(142)	1287 05 16	-	-	Erzincan TR	39 44	39 30	-	IX	-	1	-	-
(143)	1289 06 -	-	-	Istanbul TR	41 02	28 57	-	F	-	1	-	-
(144)	1293 01 11	-	Al-Karak HKJ	-	31 32	35 07	VIII-IX	IX	5.8	6	-	-
(145)	1293 03 -	-	-	Pistoia area I	43 35	10 50	c.e.	VIII	-	2	-	-
(146)	1293 09 04	-	Sannio I	-	41 18	14 33	VIII-IX	IX	5.8	6	-	-
(147)	1293 - 1294	-	-	Cairo ET	30 03	31 15	-	VI-VII ?	-	1	-	-
(148)	1295 - 1296	-	-	Sicily I	37 30	14 00	-	VIII-IX	-	1	-	-
(149)	1296 06 01	20:00	-	Istanbul TR	41 02	28 57	-	VII-VIII	-	1	-	-
(150)	1296 06 13	11:30	-	Istanbul TR	41 02	28 57	-	V ?	-	1	-	-
(151)	1296 07 17	18:15	Bergama TR	-	39 06	27 27	X	X	6.3	3	G	-
(152)	1298 11 30	-	-	Rieti I	42 24	12 52	-	V-VI	-	1	-	-
(153)	1298 12 01	-	Rieti I	-	42 34	12 54	IX-X	X	6.2	5	-	-

Num	Date	Time U.T.	Epicentral area	Locality	Lat	Lon	to	Imax	Me	Sites	EE	Ts
(154)	1298 12 01	-	-	Egypt	-	-	-	-	-	-	-	-
(155)	1299 01 08	-	-	Egypt	-	-	-	-	-	-	-	-
(156)	1300 c.	-	-	Corinth GR	-	-	-	-	-	-	-	-
(157)	1302 12 13	-	-	Istanbul TR	-	-	-	-	-	-	-	-
(158)	1303 01 15	morning	-	Istanbul TR	41 02	28 57	-	III	-	1	-	-
(159)	1303 01 17	morning	-	Istanbul TR	41 02	28 57	-	IV-V	-	1	-	-
(160)	1303 08 08	03:30	Crete GR	-	35 11	25 38	X	X	8.0	38	1	4
(161)	1303 08 -	-	Central Adriatic sea	-	43 46	14 01	VIII	IX	5.6	4	-	1
(162)	1304 10 23	00:45	Po plain I	-	45 01	10 09	V	V	4.6	4	-	-
(163)	1307 08 10	-	-	Egypt	-	-	-	-	-	-	-	-
(164)	1308/1319 ?	-	-	Maku IR	39 17	44 33	-	(IX)	-	1	-	-
(165)	1308 01 25	17:15	-	Rimini I	44 04	12 34	-	VII-VIII	-	1	-	-
(166)	1313 02 27	-	-	Egypt	-	-	-	-	-	-	-	-
(167)	1315 09 29	-	-	Istanbul? TR	41 02	28 57	-	V-VI ?	-	1	-	-
(168)	1315 12 03	-	L'Aquila area I	-	42 17	13 32	IX?	IX-X	6.0	2	-	-
(169)	1321 c.	-	-	Thebes GR	38 20	23 19	c.E.	IX	-	1	-	-
(170)	1322 01 20	-	-	Damascus SYR	33 30	36 19	-	VI ?	-	1	-	-
(171)	1323 02 25	19:00	-	Bologna I	44 30	11 20	-	V-VI	-	2	-	-
(172)	1327 05 12	19:45	-	Uluabat? TR	40 12	28 26	-	VII ?	-	1	-	-
(173)	1328 12 04	08:15	Valnerina I	-	42 51	13 01	X	X	6.4	12	-	-
(174)	1329 06 28	-	-	Etna Volcano I	37 45	15 11	-	VII-VIII	-	1	1	1
(175)	1332 01 17	18:45	-	Istanbul TR	41 02	28 57	-	F	-	1	-	-
(176)	1334 12 04	-	-	Verona I	45 26	11 00	-	VI-VII ?	-	1	-	-
(177)	1339 01 13	-	-	Tripoli RL	34 26	35 51	-	VIII	-	1	-	-
(178)	1343 - 1344	-	-	Egypt	-	-	-	-	-	-	-	-
(179)	1343 10 14	morning	-	Istanbul TR	41 02	28 57	-	VIII	-	2	-	-
(180)	1343 10 18	16:15	-	Beylerbeyi TR	41 03	29 04	-	-	-	-	-	1
(181)	1343 11 20	-	-	Istanbul TR	41 02	28 57	-	F	-	1	-	-
(182)	1344 01 03	08:00	Turkey-Syria	-	36 45	37 31	IX	IX	6.0	9	-	-
(183)	1344 11 06	08:00	Sea of Marmara TR	-	40 41	27 24	IX	IX	6.0	4	-	-
(184)	1344 - 1345	-	-	Erzincan TR	39 44	39 30	-	V-VI	-	1	-	-
(185)	1345 09 12	-	-	Florence I	43 47	11 15	-	VI	-	1	-	-
(186)	1345 12 22	-	-	Florence I	43 47	11 15	-	VI	-	1	-	-
(187)	1346 02 08	-	-	Modena I	44 39	10 56	-	V	-	1	-	-
(188)	1346 02 22	11:00	-	Ferrara I	44 50	11 37	-	VII-VIII	-	3	-	-
(189)	1347 12 08	-	-	Cairo EG	30 03	31 15	-	V	-	1	-	-
(190)	1348 01 25	15:00	Carinthia A	-	46 35	13 32	IX-X	IX-X	7.3	56	6	?
(191)	1348 09 b. 13	-	-	Subiaco I	41 55	13 06	-	VIII	-	1	-	-
(192)	1349 01 22	18:00	-	Isernia I	41 36	14 14	-	V-VI	-	1	-	-
(193)	1349 09 09	-	Northern Latium I	-	42 31	11 56	VIII-IX	VIII-IX	5.8	9	1	-
(194)	1349 09 09	-	L'Aquila-Cicolano I	-	42 16	13 08	IX	IX	6.0	17	-	-
(195)	1349 09 09	-	Sulmona I	-	42 01	13 53	IX	IX	6.0	4	1	-
(196)	1349 09 09	-	Latium-Molise I	-	41 35	13 54	X	X	6.3	20	1	-
(197)	1350 07	-	-	Paphos CY	34 43	32 34	c.E.	X	-	1	-	-
(198)	1351/1352 01 24-25	-	-	Catania I	37 30	15 05	-	VII-VIII ?	-	1	-	-
(199)	1352 10 11	-	-	Cairo EG	30 03	31 15	-	IV	-	1	-	-
(200)	1352 12 25	16:00	-	Sansepolcro I	43 34	12 03	-	VIII-IX	-	3	-	-
(201)	1353 01 01	03:00	-	Sansepolcro I	43 34	12 03	-	IX	-	2	-	-
(202)	1353 04 b.	-	-	Melfi I	41 00	15 39	-	(IX) ?	-	1	-	-
(203)	1354 03 01	17:00	Sea of Marmara TR	-	40 32	26 51	X	X	6.3	5	-	-
(204)	1355 - 1356	-	-	Erzincan TR	39 44	39 30	-	VII-VII ?	-	1	-	-

Num	Date	Time U.T.	Epicentral area	Locality	Lat	Lon	Io	I _{max}	Me	Sites	EE	T _s
(205)	1356 09 early 10	-	-	Cordoba E	37 53	-4 46	-	VIII-IX	-	2	-	-
(206)	1359 - 1381	-	-	Elbasan AL	41 06	20 05	-	(IX)	-	1	-	-
(207)	1361 07 17	17:15	-	Ascoli Satriano I	41 12	15 34	-	X	-	2	-	-
(208)	1362 - 1363	-	-	Mus AM	38 44	41 30	-	VII-VIII	-	1	-	-
(209)	1365 01 04	-	-	Algiers DZ	36 50	03 00	-	IX	-	1	-	1
(210)	1365 07 25	18:00	-	Bologna I	44 30	11 20	-	VII-VIII	-	1	-	-
(211)	1366 - 1367	-	-	Zefat IL	32 58	35 30	-	V	-	1	-	-
(212)	1369 02 01	-	-	Alessandria I	44 55	08 37	-	VII-VIII	-	2	-	-
(213)	1373 03 03	02:00	Centr.Pyrenees	-	42 31	00 42	VIII	VIII-IX	6.3	23	2	1
(214)	1373 03 03	03:00	-	Barcelona E	41 25	02 10	-	IV-V	-	1	-	-
(215)	1373 03 03	06:00	-	Barcelona E	41 25	02 10	-	III-IV	-	1	-	-
(216)	1373 03 08	02:00	-	Barcelona E	41 25	02 10	-	IV	-	2	-	-
(217)	1373 03 19	18:00	-	Barcelona E	41 25	02 10	-	V-VI	-	3	-	-
(218)	1373 05 03	15:30	Barcelona E	-	42 55	02 57	IV-V	IV-V	5.0	4	-	-
(219)	1373 05 23	19:00	Barcelona E	-	43 38	01 37	IV-V	V	5.2	6	-	-
(220)	1373 07 22	19:00	Barcelona E	-	41 25	02 10	-	F	-	1	-	-
(221)	1373 09 22	01:30	-	Montpellier F	43 37	03 52	-	F	-	1	-	-
(222)	1373 10 19	-	-	Cairo ET	30 03	31 15	-	IV	-	1	-	-
(223)	1374 12 08	-	-	Erzincan TR	39 44	39 30	-	VIII	-	1	-	-
(224)	1377 11 14	-	-	Tropea I	38 40	15 54	-	VII-VIII ?	-	1	-	-
(225)	1384 08 06	-	-	Mitylene GR	39 06	26 33	-	IX	-	1	-	-
(226)	1385 09 19 - 20	night	-	Cairo ET	30 03	31 15	-	III-IV	-	1	-	-
(227)	1386 03 17	-	-	Naples I	40 51	14 16	-	VII-VIII ?	-	1	-	-
(228)	1386 07 17	07:45	-	Cairo ET	30 03	31 15	-	III-IV	-	1	-	-
(229)	1387 03 05	05:00	-	Zadar HR	44 07	15 15	-	V-VI	-	1	-	-
(230)	1388 03 20	12:30	Chios island GR	-	38 16	26 31	VIII-IX	IX-X	5.8	4	-	2
(231)	1389 08 20	13:00	-	Moggio Udinese I	46 24	13 12	-	VII-VIII	-	3	-	-
(232)	1389 10 18	-	Umbria-Marche I	-	43 32	12 22	VIII-IX	VIII-IX	5.8	7	-	-
(233)	1390 12 05	01:00	-	Zadar HR	44 07	15 15	-	V-VI	-	1	-	-
(234)	1391 08 15	-	-	Istanbul TR	41 02	28 57	-	F	-	1	-	-
(235)	1392 04 13	-	-	Cyprus island CY	35 00	33 00	-	IX ?	-	1	-	-
(236)	1395 10 -	-	-	Edhessa GR	40 48	22 03	-	X ?	-	2	-	-
(237)	1395 11 12	15:45	-	Cyprus island CY	35 00	33 00	-	F	-	1	-	-
(238)	1395 11 30	-	-	Thessaloniki GR	40 10	24 19	-	VIII-IX	-	2	-	-
(239)	1395 12 13	-	-	Mt. Athos GR	40 10	24 19	-	IV-V	-	1	-	-
(240)	1396 01 07	12:00	-	Mt. Athos GR	40 10	24 19	-	IV-V	-	1	-	-
(241)	1396 06 01	20:30	-	Mt. Athos GR	40 10	24 19	-	IV-V	-	1	-	-
(242)	1396 08 01	19:00	-	Mt. Athos GR	40 10	24 19	-	IV-V	-	1	-	-
(243)	1396 11 26	-	-	Monza I	45 35	09 16	-	VII-VIII	-	1	-	-
(244)	1397 04 28	-	-	Mt. Athos GR	40 10	24 19	-	V-VI	-	1	-	-
(245)	1397 04 29	-	-	Mt. Athos GR	40 10	24 19	-	V-VI	-	1	-	-
(246)	1397 06 17	00:00	-	Mt. Athos GR	40 10	24 19	-	V-VI	-	1	-	-
(247)	1397 04 29	-	-	Cyprus island CY	35 00	33 00	-	NC	-	1	-	-
(248)	1399 07 20	-	Tusco Emilian Ap. I	-	44 26	10 55	VII	VIII	5.8	7	-	-
(249)	1399 09 20	night	-	Damascus SYR	33 30	36 19	-	III-IV	-	1	-	-
(250)	1399 10 21	15:00	-	Zadar HR	44 07	15 15	-	VI-VII	-	1	-	-
(251)	1399 11 06	15:00	-	Zadar HR	44 07	15 15	-	V-VI	-	1	-	-
(252)	1400 01 -	-	-	Bursa TR	40 11	29 04	-	VIII-IX	-	1	-	-
(253)	1402 07 -	-	Gulf of Corinth	-	38 09	22 20	X	X	6.3	6	4	2
(254)	1402 07 28	-	-	Istanbul TR	41 02	28 57	-	VI-VII ?	-	1	-	-
(255)	1403 12 18	-	-	Aleppo SYR	36 14	37 10	-	IV-V ?	-	1	-	-

Num	Date	Time U.T.	Epicentral area	Locality	Lat	Lon	Io	Imax	Me	Sites	EE	Ts
(256)	1404 02 20	-	-	Al-Marqab SYR	35 09	35 57	--	IX	-	3	-	-
(257)	1404 11 05	-	-	Aleppo SYR	36 14	37 10	-	V	-	1	-	-
(258)	1404 - 1405	-	-	Hesat region	-	-	-	IX-X	-	1	-	-
(259)	1406 b. 11 29	-	-	Tat'ew AM	39 23	46 14	-	VI	-	1	-	-
(260)	1407 04 09	-	-	Antioch TR	36 14	36 07	-	VIII-IX	-	1	-	-
(261)	1407 06 25	-	-	Zadar HR	44 07	15 15	-	VI ?	-	1	-	-
(262)	1408 01 03	16:30	-	Bologna I	44 30	11 20	--	V	-	2	-	-
(263)	1408 12 29	-	Syria-Cyprus	-	35 40	36 10	IX	X	6.0	5	3	1
(264)	1409 08 14	08:45	-	Ferrara I	44 50	11 37	-	IV	-	1	-	-
(265)	1409 08 17	-	-	Ferrara I	44 50	11 37	-	VI	-	1	-	-
(266)	1409 11 15	11:15	-	Parma I	44 48	10 20	-	VII	-	1	-	-
(267)	1411 01 09	01:30	-	Ferrara I	44 50	11 37	-	VII	-	1	-	-
(268)	1414 --	-	-	Vieste I	41 53	16 11	-	VIII-IX ?	-	1	-	-
(269)	1414 08 03	17:35	North. Tuscany I	-	43 56	10 36	VI	VII	5.2	5	-	-
(270)	1414 08 07	15:00	Colline Metallifere I	-	43 16	11 07	VII-VIII	VIII	5.8	5	1	-
(271)	1417 08 20-25	-	-	Euboea island GR	38 30	24 14	-	VIII-IX	-	1	-	-
(272)	1418 03 07	-	-	Vrana HR	43 57	15 34	-	VIII	-	1	-	-
(273)	1419 03 15	aftern.	-	Bursa TR	40 11	29 04	-	VIII	-	1	G	-
(274)	1419 03 26	-	-	Erzincan TR	39 44	39 30	-	VIII-IX ?	-	1	-	-
(275)	1419 - 1420	-	-	Istanbul TR	41 02	28 57	-	VI-VII ?	-	1	-	?
(276)	1420 07 -	-	-	Thessaloniki GR	40 38	22 56	-	IX	-	1	-	-
(277)	1421 01 21	-	-	Artokosta GR	37 18	22 46	-	(VIII) ?	-	2	-	-
(278)	1421 09 18	-	-	Euboea GR	38 30	24 14	-	VIII	-	1	-	-
(279)	1422 04 13	00:10	W. Peloponnese GR	-	37 00	21 57	VIII-IX	IX	5.8	5	-	-
(280)	1422 06 28	-	-	Cairo ET	30 03	31 15	-	III-IV	-	1	-	-
(281)	1425 06 23	03:00	-	Cairo ET	30 03	31 15	-	VI ?	-	1	-	-
(282)	1427 03 13-19	-	-	Amer	42 00	02 35	c. e.	X	-	15	2	-
(283)	1427 04 22	22:00	Sant Julià del Llor E	-	41 58	02 40	VI-VII	VII-VIII	5.3	3	1	-
(284)	1427 05 15	-	Olot E	-	42 09	02 27	VII-VIII	VIII-IX	5.4	9	-	-
(285)	1427 06 17	-	-	Caldés Malavella E	41 50	02 48	-	IX	-	2	1	-
(286)	1428 02 02	08:00	Puigcerdà E	-	42 22	02 09	IX-X	IX-X	6.7	44	-	-
(287)	1428 05 -	-	-	Koroni GR	36 47	21 56	-	VIII-IX	-	2	-	-
(288)	1428 11 10	-	-	Messina I	38 11	15 33	-	(VI-VII)	-	1	-	-
(289)	1430 03 26	midnight	-	Thessaloniki GR	40 38	22 56	-	V-VI ?	-	1	-	-
(290)	1431 04 24	midday	-	Utrera area E	37 11	-5 47	-	IX-X	-	3	G	-
(291)	1433 05 04	08:05	Bologna I	-	44 30	11 20	VI	VII	5.5	4	-	-
(292)	1434 11 06	-	-	Cairo ET	30 03	31 15	-	IV-V	-	1	-	-
(293)	1437 09 04-24	-	-	Istanbul TR	41 02	28 57	-	V ?	-	1	-	-
(294)	1437 11 24-27	-	-	Istanbul TR	41 02	28 57	-	NC	-	1	-	-
(295)	1437 11 27	-	-	Eceabat TR	40 11	26 21	-	NC	-	1	-	-
(296)	1438 02 02	12:15	-	Grottaferrata I	41 47	12 41	-	VII-VIII ?	-	1	-	-
(297)	1438 02 13	14:00	-	Cairo ET	30 03	31 15	-	III	-	1	-	-
(298)	1438 06 11	02:00	Parma area I	-	44 51	10 14	VIII	VII	5.6	4	-	-
(299)	1441 --	-	-	Ahlet TR	38 45	42 29	-	V ?	-	2	G	-
(300)	1444 b. 08 26	-	-	Ulcinj scg	41 56	19 12	-	VIII-IX	-	1	-	-
(301)	1448 05 25	00:00	Catalonia E	-	41 41	02 12	IX	(IX)	6.4	22	-	-
(302)	1452 - 1453	-	-	Istanbul TR	41 02	28 57	-	F	-	1	-	-
(303)	1453 09 28	22:45	Florence I	-	43 47	11 17	VII-VIII	VII-VIII	5.4	5	-	-
(304)	1453 - 1454	-	-	Florence I	-	-	-	-	-	-	-	-
(305)	1454 summer	-	-	Istanbul TR	41 02	28 57	-	III-IV	-	1	-	-
(306)	1455 02 06	-	-	Middle Reno vall. I	44 20	11 11	-	VIII	-	1	-	-

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Num	Date	Time U.T.	Epicentral area	Locality	Lat	Lon	to	Imax	Me	Sites	EE	TS
(307)	1455 03 06	-	-	Cairo ET	30 03	31 15	-	IV-V	-	1	-	-
(308)	1455 12 20	20:45	Middle Reno vall. I	-	44 25	11 16	VI-VII	VII-VIII	5.3	5	-	-
(309)	1456 ? 05 13	-	-	Monte Athos GR	40 10	24 19	-	VII-VIII ?	-	1	-	-
(310)	1456 12 05	03:00	Central-south. Italy	-	42 12	13 55	X	X-XI	5.8	17	-	-
(311)	1456 12 05	03:00	Isernia area I	-	41 32	14 30	XI	XI	7.0	89	4	-
(312)	1456 12 05	03:00	Samnium-Irpinia I	-	41 11	14 52	XI	XI	7.0	82	2	1
(313)	1456 12 05	03:00	Apulia region I	-	41 05	15 40	IX	IX	6.3	18	-	-
(314)	1456 12 07	21:05	Naples I	-	40 51	14 16	-	III-IV	-	1	-	-
(315)	1456 12 21-22	-	Naples I	-	40 51	14 16	-	F	-	1	-	-
(316)	1456 12 30	08:20	-	Naples I	40 51	14 16	-	VII	-	2	1	-
(317)	1457 01 08-09	-	-	Naples I	40 51	14 16	-	VI	-	1	-	-
(318)	1457 02 10-11	-	-	Capua I	41 06	14 13	-	VI-VII	-	2	-	-
(319)	1457 04 23	03:30	-	Erzincan TR	39 44	39 30	-	X	-	2	1	-
(320)	1458 04 25	-	-	Città di Castello I	43 27	12 14	-	F	-	1	-	-
(321)	1458 04 26	12:15	Tiberina Valley I	-	43 28	12 14	VIII-IX	VIII-IX	5.8	5	-	-
(322)	1458 04 29-30	-	-	Città di Castello I	43 27	12 14	-	F	-	1	-	-
(323)	1458 05 01	00:35	-	Città di Castello I	43 27	12 14	-	VII	-	2	-	-
(324)	1458 11 08/16	-	Al-Karak HK	-	31 11	35 42	VIII	IX	5.6	5	-	-
(325)	1461 11 16	-	-	L'Aquila I	42 21	13 24	-	F	-	1	-	-
(326)	1461 11 27	21:05	Abruzzo Ap. I	-	42 19	13 33	X	X	6.3	9	-	-
(327)	1461 12 11	-	-	L'Aquila I	42 21	13 24	-	F	-	1	-	-
(328)	1461 12 18	00:10	-	L'Aquila I	42 21	13 24	-	NC	-	1	-	-
(329)	1462 01 03	20:25	-	L'Aquila I	42 21	13 24	-	V	-	1	-	-
(330)	1462 01 04	22:25	-	L'Aquila I	42 21	13 24	-	V	-	1	-	-
(331)	1462 03 27	02:00	-	L'Aquila I	42 21	13 24	-	V	-	1	-	-
(332)	1462 03 27	21:00	-	L'Aquila I	42 21	13 24	-	F	-	1	-	-
(333)	1462	-	-	Nafpaktos GR	38 24	21 50	-	VIII-IX	-	1	-	-
(334)	1463	-	-	Ios island GR	36 44	25 16	-	V-VI	-	2	G	-
(335)	1465 04 07	15:30	Po Plain I	-	44 57	10 41	V-VI	VI-VII	4.7	5	-	-
(336)	1466 01 15	02:25	Irpinia I	-	40 46	15 20	VIII-IX	VIII-IX	6.1	31	-	-
(337)	1467 12 14-15	night	-	Cairo ET	30 03	31 15	-	VI	-	1	-	-
(338)	1468 06 06	10:30	-	Rimini I	44 04	12 34	-	V	-	3	-	-
(339)	1469 spring	-	-	Cephalonia isl. GR	38 15	20 35	-	IX-X	-	3	-	-
(340)	1469 03 27	16:10	-	Cesena I	44 08	12 15	-	F	-	1	-	-
(341)	1469 03 29	03:15	-	Cesena I	44 08	12 15	-	F	-	1	-	-
(342)	1469 04 02	22:15	-	Cesena I	44 08	12 15	-	III	-	1	-	-
(343)	1470 - 1472	-	-	Palaeokastron GR	40 00	25 25	-	VIII-IX	-	2	-	-
(344)	1473 05 07	07:45	Po Plain I	-	45 19	09 20	IV-V	V	4.4	5	-	-
(345)	1476 10 20	-	-	Cairo ET	30 03	31 15	-	V	-	1	-	-
(346)	1477 01 c.01	-	-	Foligno I	42 57	12 42	-	F	-	1	-	-
(347)	1477 01 30	16:00	-	Foligno I	42 57	12 42	-	V-VI	-	1	-	-
(348)	1477 02 03	01:00	-	Foligno I	42 57	12 42	-	VII-VIII	-	3	-	-
(349)	1477 10 12	-	-	Cyprus ?	-	-	-	-	-	-	-	-
(350)	1479 10 16	08:00	-	Nicosia CY	35 10	33 22	-	V-VI	-	1	-	-
(351)	1480	-	southern Marche I	-	42 54	13 48	VII-VIII	VII-VIII	5.5	4	-	-
(352)	1481 02 06	21:15	northern Tuscany I	-	43 56	10 21	V-VI	V-VI	4.7	4	-	-
(353)	1481 02 07	dawn	-	Lucca I	43 51	10 30	-	V-VI	-	1	-	-
(354)	1481 02 07	22:15	-	Modena I	44 39	10 56	-	V	-	2	-	-
(355)	1481 02 14	22:00	-	Dubrovnik HR	42 40	18 07	-	VII-VIII	-	1	-	-
(356)	1481 03 18	13:15	Cyprus	-	35 05	33 11	VIII	VIII-IX	5.6	4	-	-
(357)	1481 04 23	-	-	Nicosia CY	-	-	-	-	-	-	-	-

Num	Date	Time U.T.	Epicentral area	Locality	Lat	Lon	To	Imax	Me	Sites	EE	Ts
(358)	1481 05 07	14:15	Lunigiana I	-	44 16	10 08	VIII	VIII	5.6	6	-	-
(359)	1481 05 03	06:30	-	Rhodes GR	36 26	28 13	-	V-VI	-	1	-	2
(360)	1481 10 03	-	-	Rhodes GR	36 26	28 13	-	V-VI	-	1	-	-
(361)	1481 12 17	22:00	-	Rhodes GR	36 26	28 13	-	IV-V	-	1	-	-
(362)	1481 12 18	03:00	-	Rhodes GR	36 26	28 13	-	V-VI	-	1	-	-
(363)	1481 12 18	05:15	-	Rhodes GR	36 26	28 13	-	VIII-IX	-	1	G	-
(364)	1481 12 19	05:15	-	Rhodes GR	36 26	28 13	-	IV-V	-	1	-	-
(365)	1481 - 1482	-	-	Erzincan TR	39 44	39 30	-	X	-	1	-	-
(366)	1482 02 -	-	-	Dubrovnik HR	42 40	18 07	-	V-VI	-	1	-	-
(367)	1482 09 26	-	-	Dubrovnik HR	42 40	18 07	-	F	-	1	-	-
(368)	1483 06 14-15	night	-	Cairo ET	30 03	31 15	-	IV	-	1	-	-
(369)	1483 08 11	19:40	Romagna I	-	44 09	12 14	VIII	VIII-IX	5.8	14	-	-
(370)	1484 03 29	-	-	Aleppo SYR	36 14	37 10	-	V	-	1	-	-
(371)	1487 01 11	12:40	-	Ferrara I	44 50	11 37	-	V	-	2	-	-
(372)	1489/1490	-	-	Istanbul TR	41 02	28 57	-	VII-VIII ?	-	1	-	-
(373)	1491 01 24	23:50	-	Padua I	45 24	11 53	-	(VI-VII) ?	-	1	-	-
(374)	1491 spring	-	-	Çatak TR	-	-	-	-	-	-	-	-
(375)	1491 04 24	17:00	Cyprus	-	34 56	33 24	IX	IX	6.6	10	1	-
(376)	1493 10 18	14:30	Kos island GR	-	36 49	27 08	IX	IX	6.5	7	-	-
(377)	1494 05 29	01:50	-	Messina I	38 11	15 33	-	VII-VIII	-	1	-	-
(378)	1494 07 01	10:10	-	Crete island GR	35 12	24 56	-	VIII-IX	-	2	-	1
(379)	1494 07 01	21:10	-	Iraklion GR	35 20	26 09	-	V	-	1	-	-
(380)	1496 11 28	08:45	-	Dubrovnik HR	42 40	18 07	-	V-VI	-	1	-	-
(381)	1497 03 03	-	-	Lunigiana area I	44 15	09 55	-	VIII-IX	-	1	-	-
(382)	1497 11 11	-	-	Nicosia ? CY	-	-	-	-	-	-	-	-
(383)	1498 09 18	-	-	Cairo ET	30 03	31 15	-	V	-	1	-	-

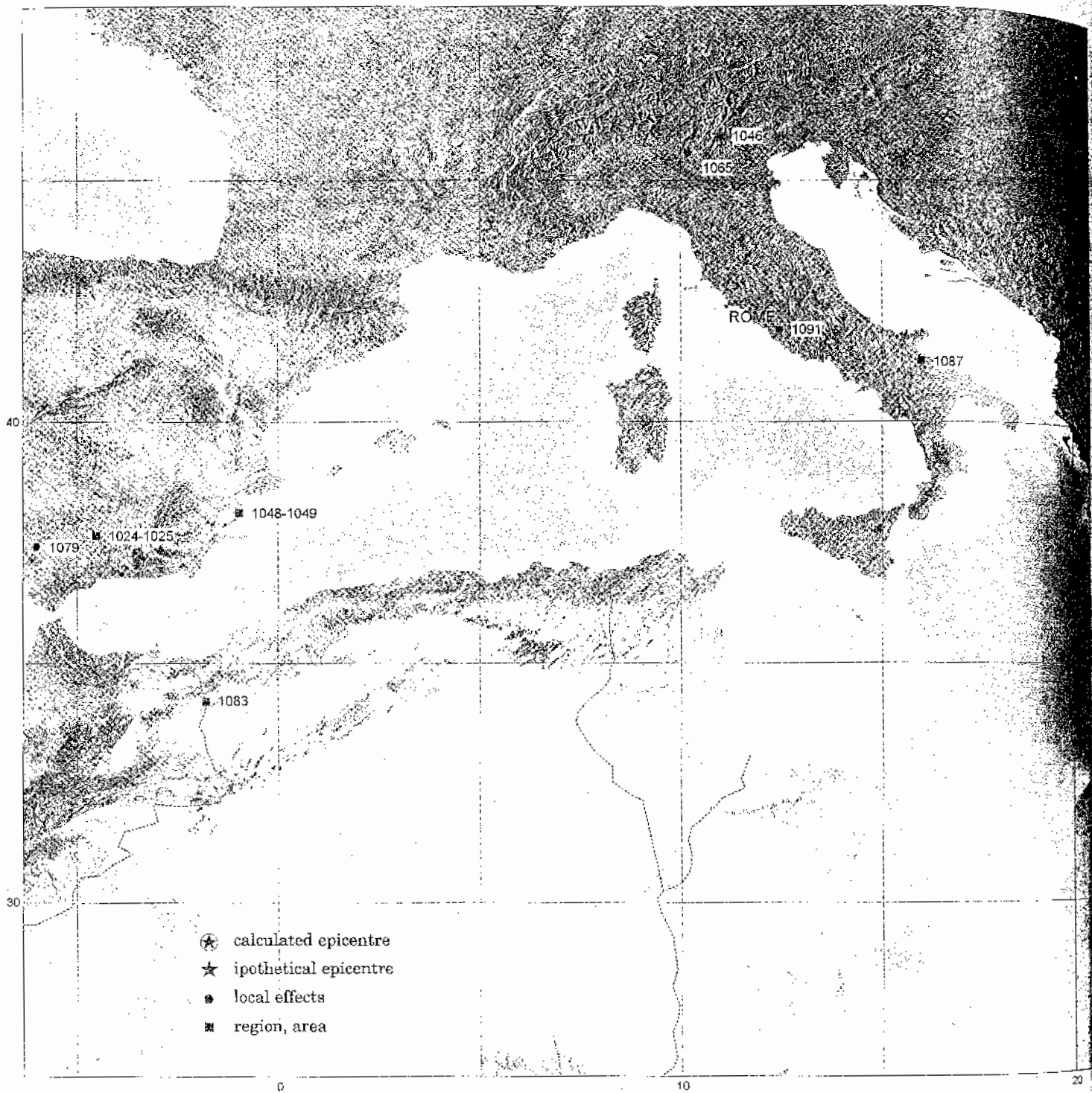
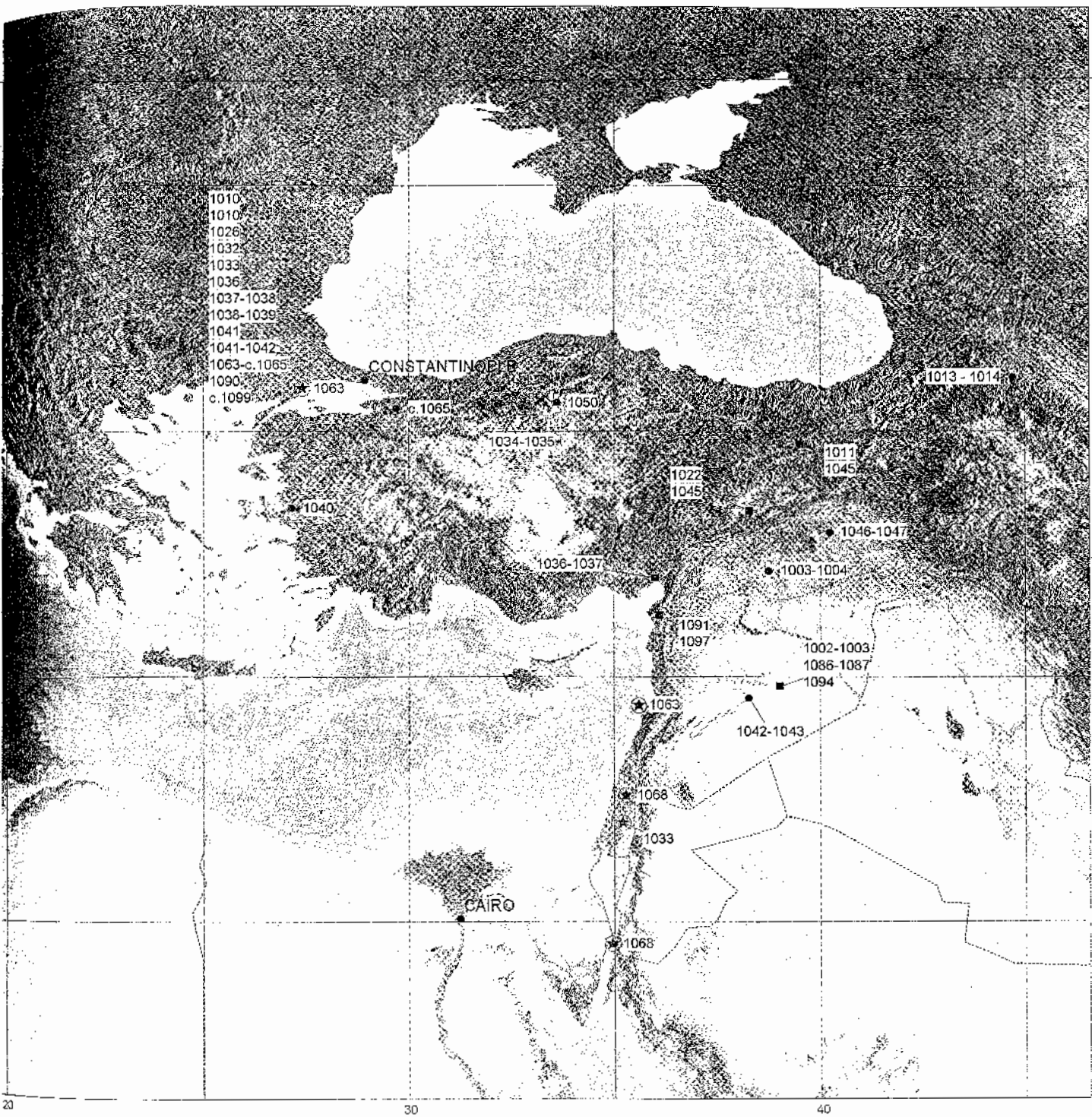


fig. 148 11th century earthquake map.



20

30

40

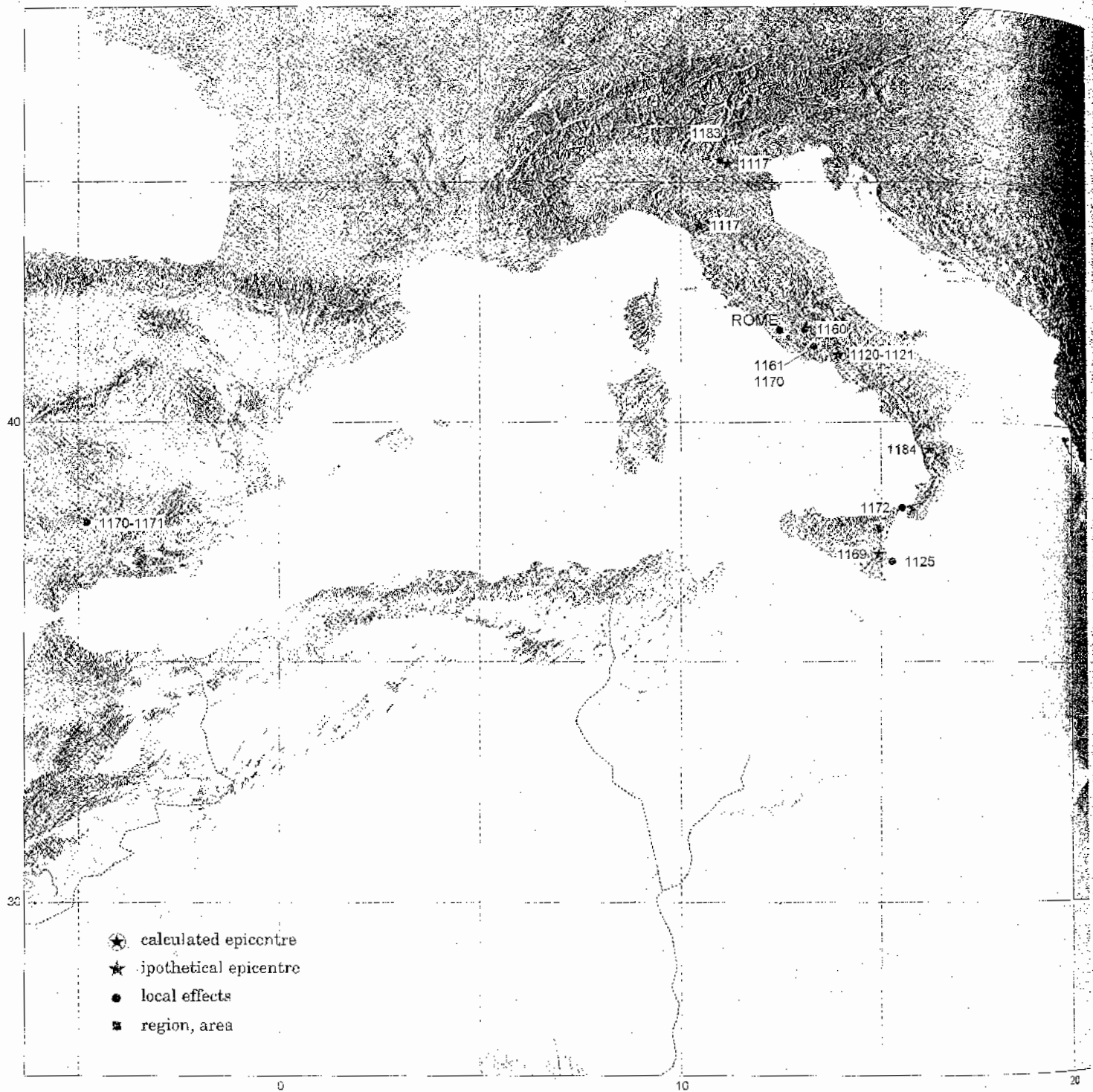
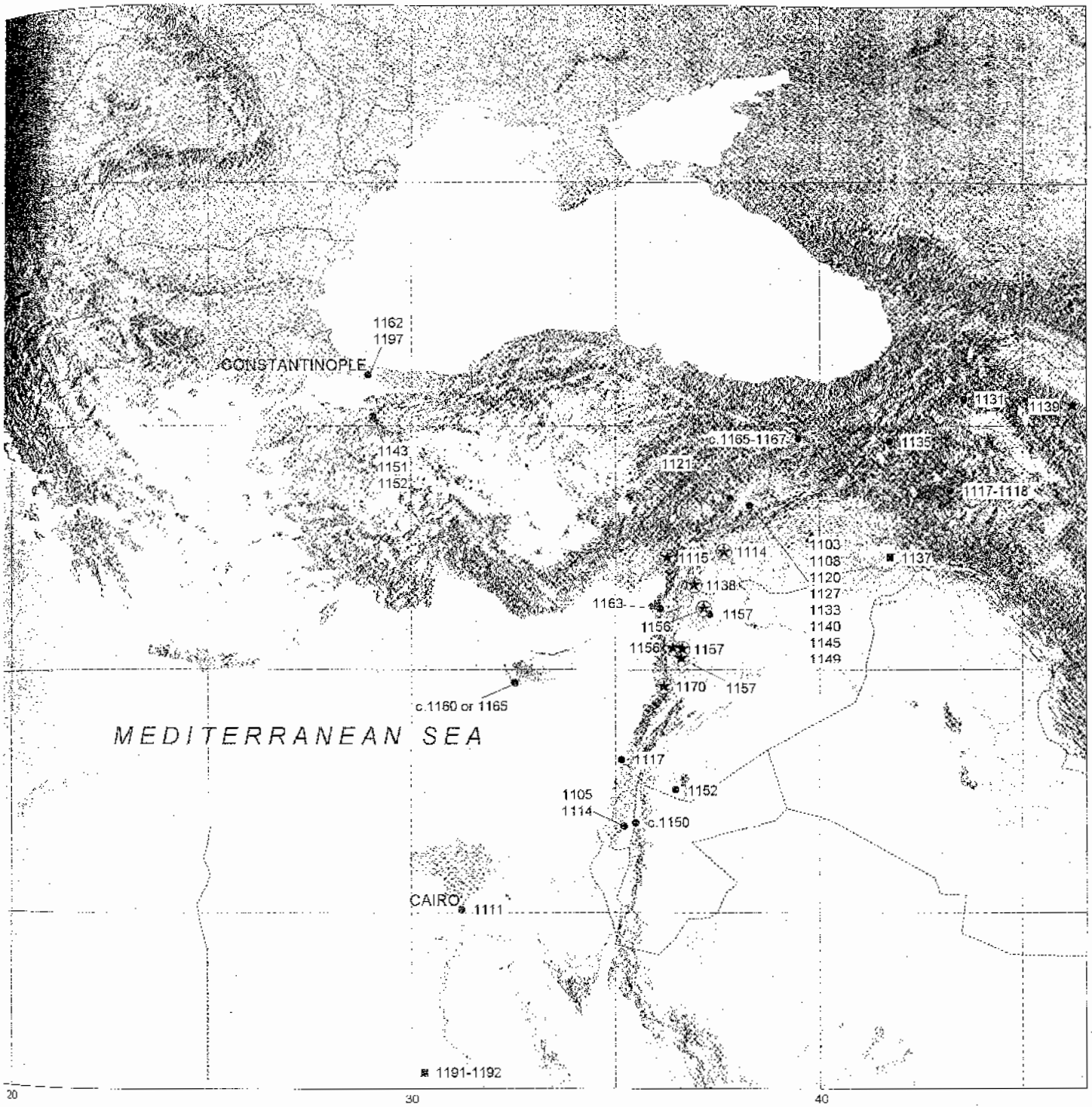


fig. 149 12th century earthquake map.



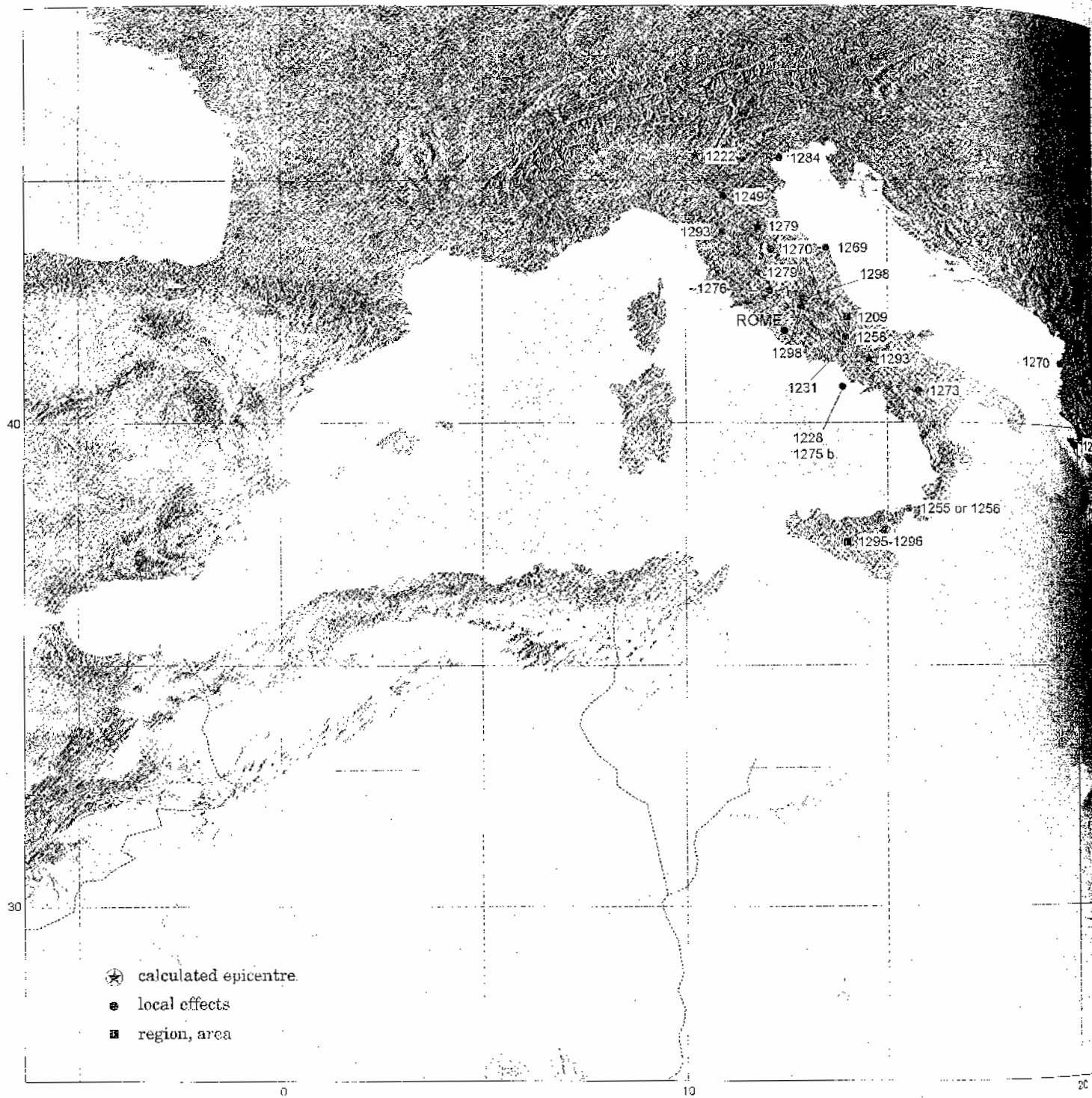


fig. 150 13th century earthquake map.



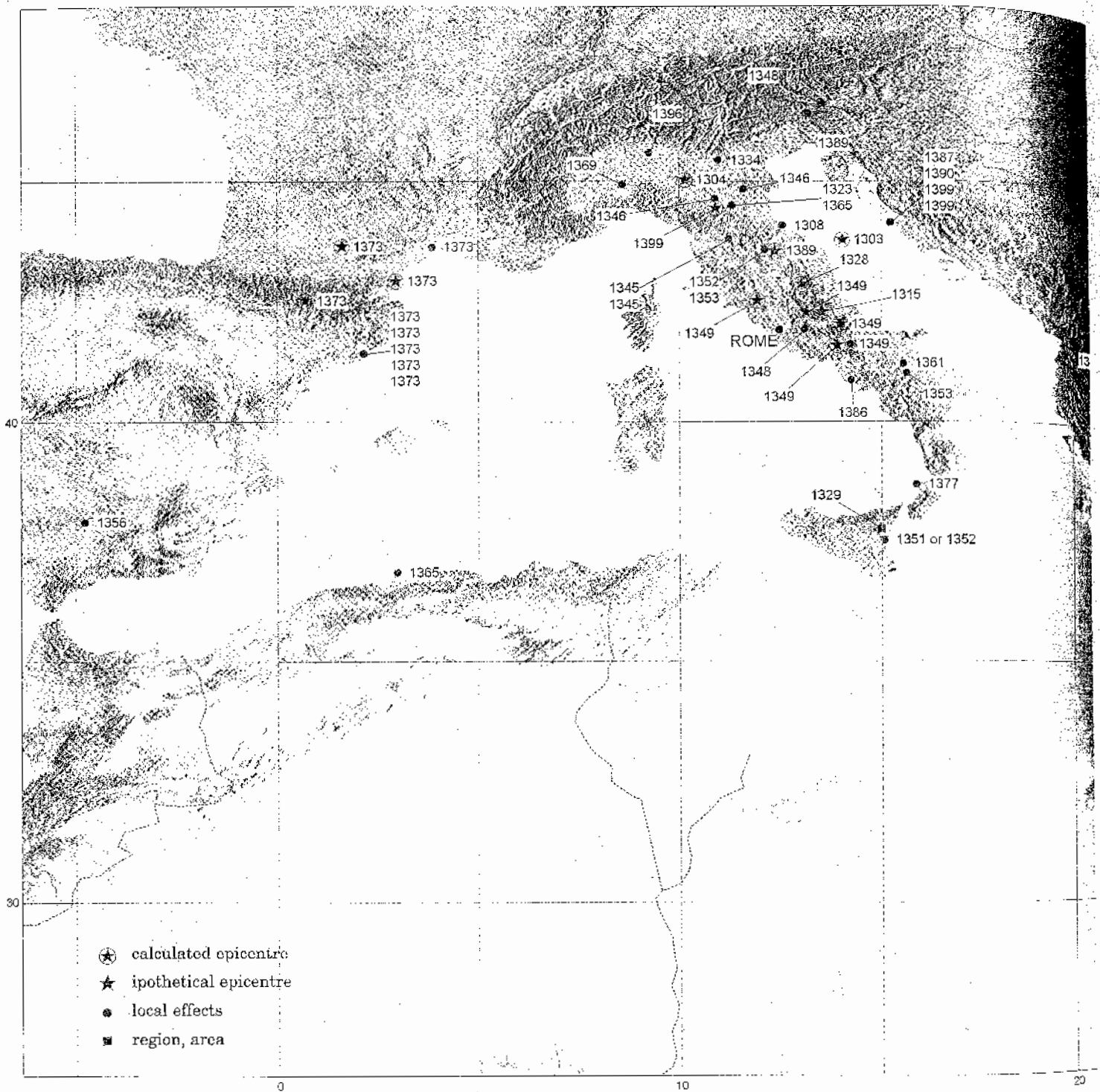
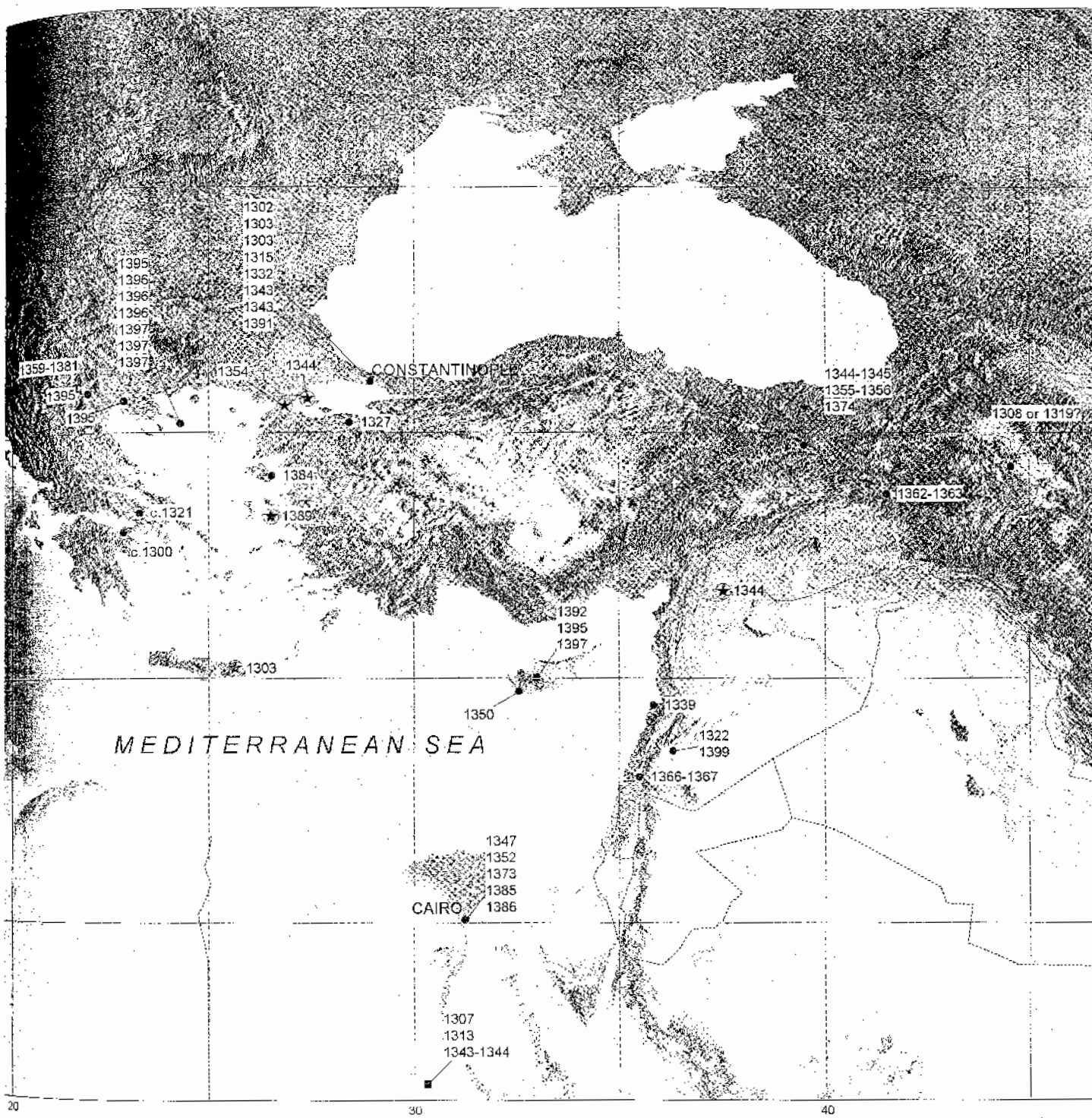


fig. 151 14th century earthquake map.



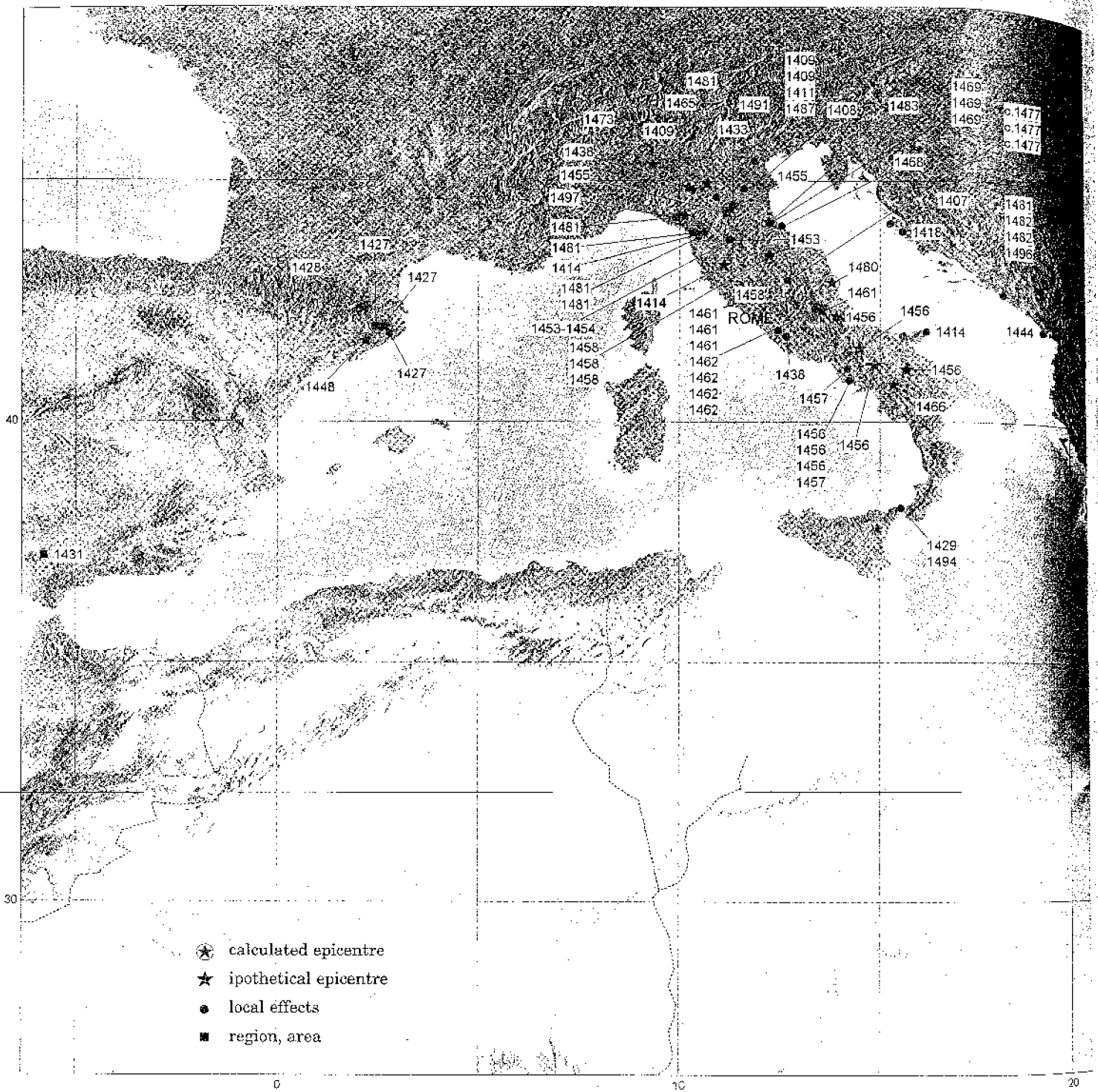
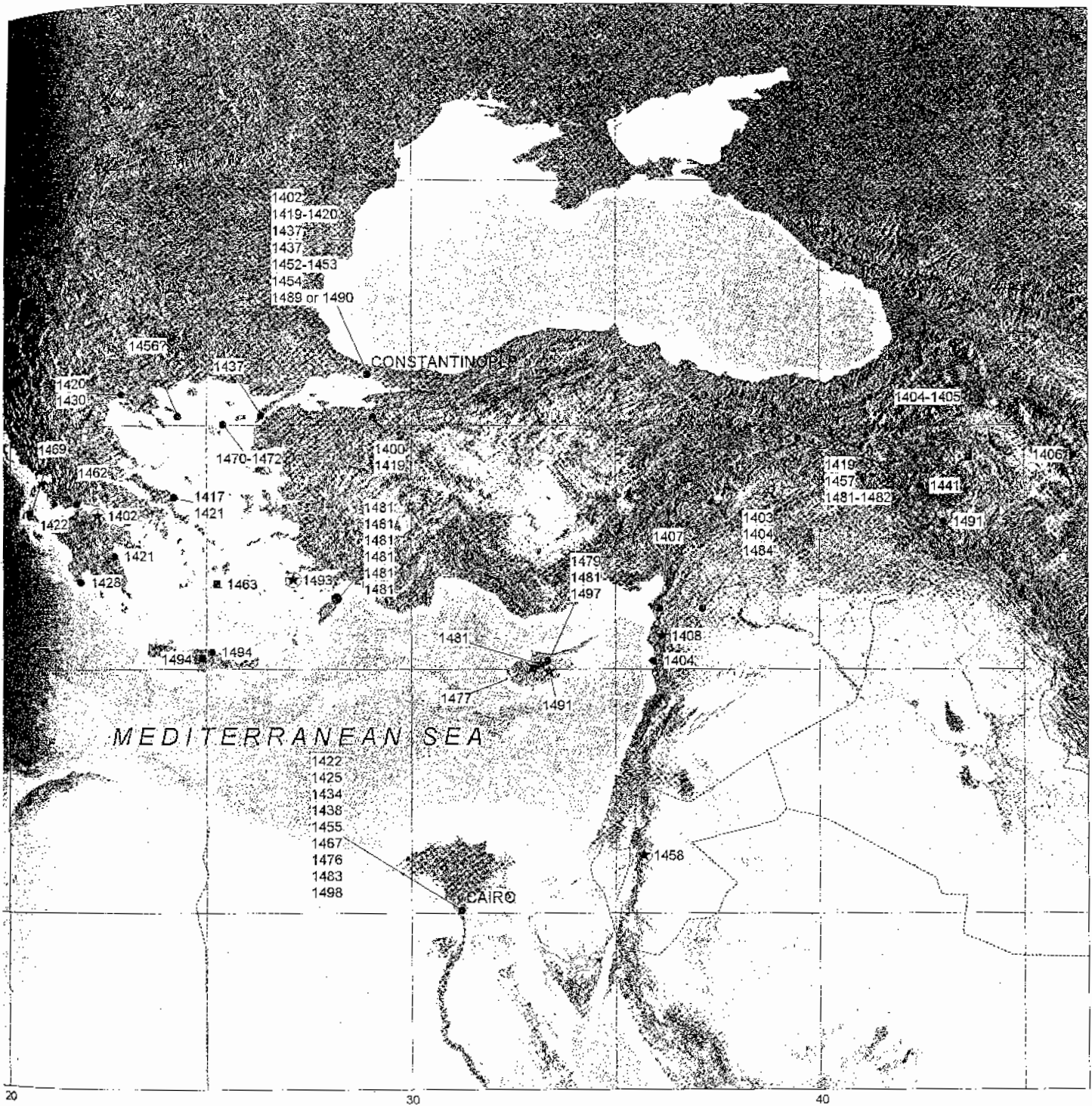


fig. 152 15th century earthquake map.



15th century map

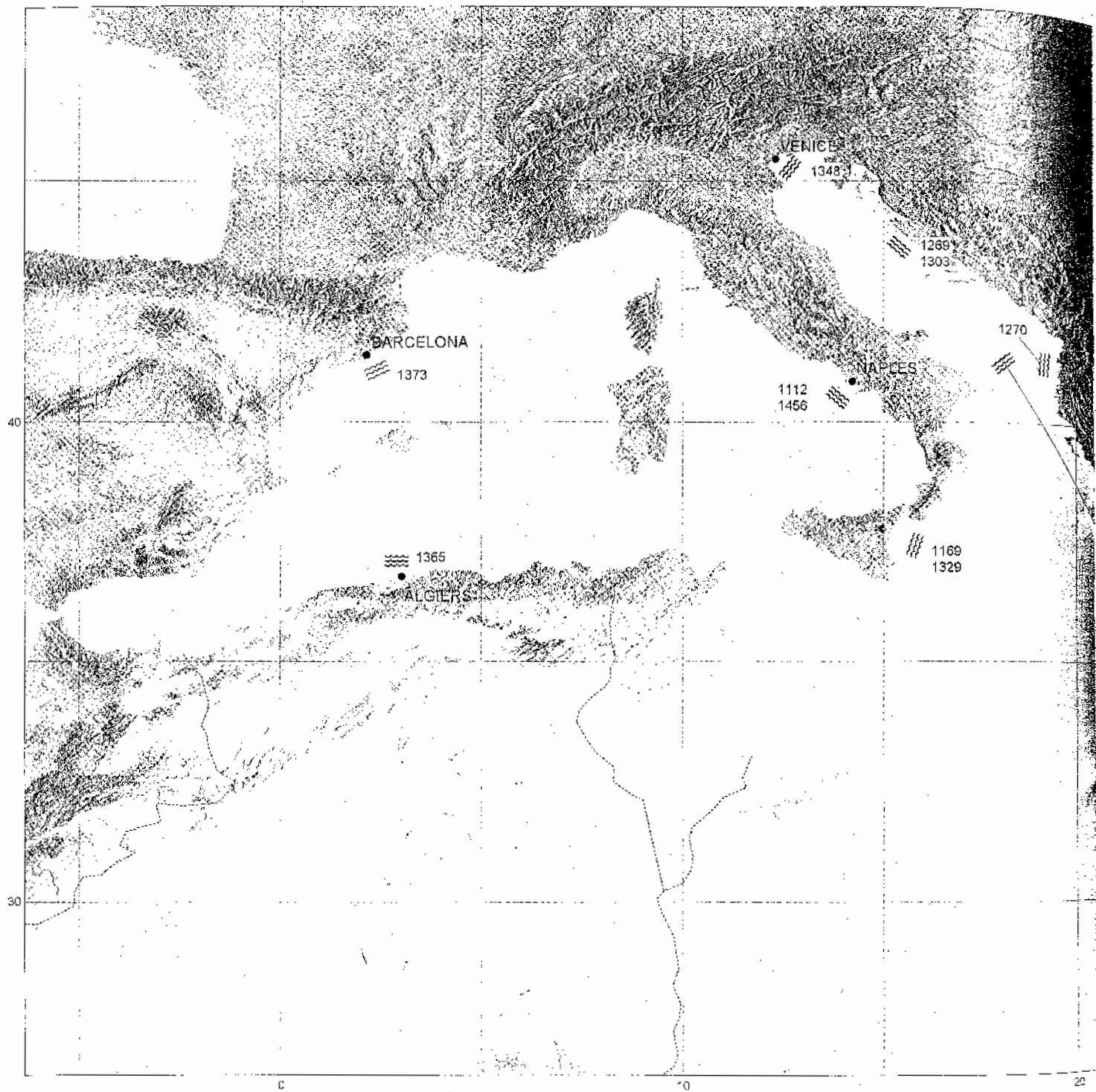
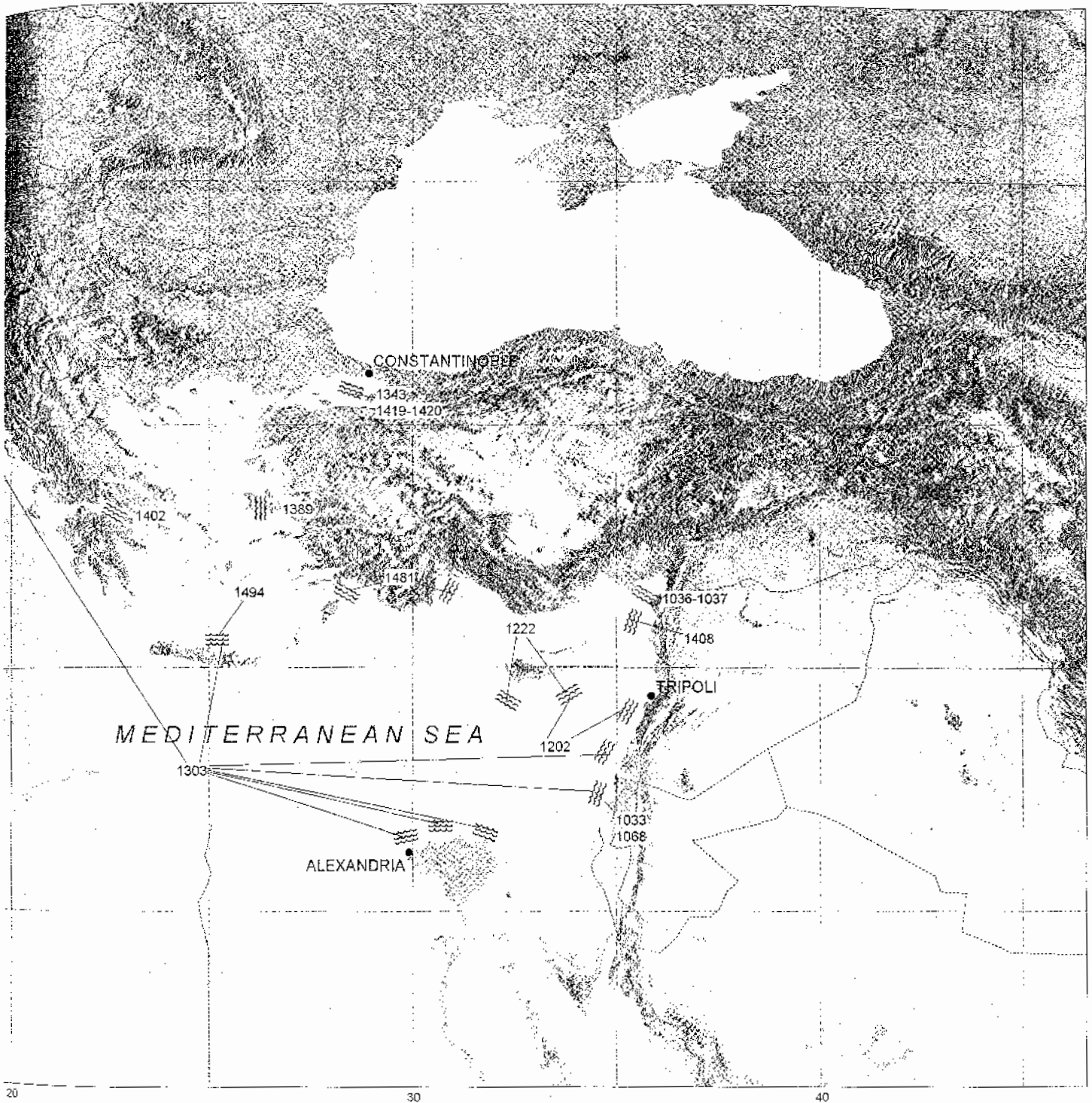


fig. 153 Tsunami map.



Notes on Authors and Works

Some concise chronological and general information on the authors and the works used as memorial primary sources (sources 1). Late sources in relation to the events have only been used in a few cases, owing to the loss of a more ancient textual tradition. The archival sources are not included here as they refer back to administrative practices contemporary to the events.

The number or numbers between < > indicate the entry or entries in which the author or the work is cited. The titles of the works (annals, chronicles, notae, notulae, etc.) are only specified when the authors are either unknown or are not explicitly stated. The names of the Arabic and Armenian authors are simplified, that is without diacritic marks.

'Abd al-Latif al-Baghdadi, Muwaffaq al-Din Abu Muhammad b. Yusuf

(1162-1231) [Arab.]

A polymath, also known as Ibn al-Labbad, who was born and died at Baghdad. For study purposes he moved between the principal centres of learning in the Arab world. His historical work *Kitab al-ifada* is about Egypt, and became known in Europe thanks to Latin, German and French translations. < 097 >

Abu 'l-Faraj see Bar Hebraeus

Abu 'l-Fida, Isma'il b. 'Ali Muhammad b. Shahanshah ... 'Imad al-Din

(1273-1331) [Arab.]

A Syrian prince, historian and geographer of the Ayyubids. He wrote some religious and literary works, now lost, as well as a universal history, *Mukhtasar al-bashar*, which goes from the pre-Islamic period up to 729/1329. For the early period, his compilation relies on that of Ibn al-Athir. His fame is also due to another work, *Taqwim al-buldan*, a descriptive geographical work partly based on an Arabic translation of Ptolemy.

< 037 > < 097 > < 160 >

Abu Shama, Shihab al-Din Abu Muhammad 'Abd al-Rahman b. Isma'il

al-Maqdisi al-Dimashqi (1203-1268) [Arab.]

An Arab polymath, who was born at Damascus. He excelled as much in religious learning as in history, and two of his historical works were highly regarded. The first of these, *Kitab al-rawdatayn*, is a history of Nur al-Din and Saladin, while in the second, *Dhayl al-rawdatayn*, he brings to bear his own experience of events, along with numerous quotations from *Mir'at al-Zaman* by the historian Sibt Ibn al-Jawzi.

< 076 - 080 > < 097 > < 101 >

Acindynus Gregory (died 1348) [Gr.]

A Byzantine theologian and polemicist. Amongst his writings are two refutations of the works of Gregory Palamas and a large number of letters published by Hero (1983).

< 179 - 181 >

Acropolites George (1217-1282) [Gr.]

A civil servant, teacher and historian. He wrote a historical work which is of fundamental importance for the period 1203-1261, published by Heisenberg (1903). < 108 >

Additamenta anonyma ad Chronicas Andreae Danduli (1280-1339) [Lat.]

Ambrosian codex A 141 inferiore not only brings together Andrea Dandolo's two *Chronicas*, but also includes amplifications and additions which are probably by his collaborators. < 136 >

Albertucci de' Borselli Gerolamo (1432-1497) [Lat.]

He belonged to an ancient family of Bologna (Italy), and entered the Dominican order in 1457. In 1493 he was general inquisitor for Bologna, and two years later he was in Rome. His historical works used to be preserved in manuscript in the library of the convent of S.Domenico in Bologna, but they were largely lost. Those that survive are the *Cronica gestorum ac factorum memorabilium civitatis Bononie (ab urbe condita ad a.1497)*, the *Cronica magistrorum generalium Ordinis fratrum Praedicatorum*, and the *Additiones* to the *Chronicon pontificum et imperatorum* by Martinus Oppaviensis, of which only records of the popes from Nicholas III (1277-1280) to Alexander VI (1492-1503) survive.

< 291 > < 308 >

Albricus of Trium-fontium (13th c.) [Lat.]

A Cistercian monk at the monastery of Troisfontaines (in the diocese of Châlons, in France). He wrote a *Chronicon* from ancient times up to the year 1241. First published by Leibniz (1698) and republished by Scheffer-Boichorst (1874) in the *Monumenta Germaniae Historica*.

< 104 > < 105 >

Alexander von Zweibrücken (15th c.) [Ger.]

A count palatine, who was in Cyprus in August-September 1495 in the company of his brother-in-law and his secretary, Johann Meisenheimer.

< 375 >

Aliprandi Bonamente (c.1350-1417) [It.]

He was a jurist from Mantua. In 1382 he went to Avignon as ambassador of the Gonzagas to Urban VI. In 1388 he became a member of the council of the Commune of Mantua, and in this capacity he was involved in the election of Francesco Gonzaga as captain and lord of the city. A year later he became a communal administrator and afterwards prior of the college of jurisconsults of Mantua. He wrote a verse chronicle in Italian, known as the *Aliprandina*, about events in Mantua from ancient times up to 1414. It was continued to 1460 by other hands.

< 190 >

Amadei Luca (15th c.) [It.]

As plenipotentiary of the Republic of Siena, he was sent on a diplomatic mission to the Kingdom of Naples after the earthquake of 5 December 1456. He left Siena on 26 December 1456, arrived in Rome on 31 and reached Naples on 8 January 1457. He left there two days later for Foggia, where king Alfonso of Aragon was in residence, arriving on 16 January. He remained in Apulia throughout the month of January 1457. One of his letters, sent from Naples on 9 January 1457, is in the Archivio di Stato in Siena and partly transcribed in Figliuolo (1988-89, I, p.37).

< 310 - 318 >

Amalric I (1135-1174) [Lat.]

He was the son of king Fulk of Jerusalem, and brother of Baldwin III (1144-1162), and he himself reigned as king of Jerusalem from 1162 to 1174. He wrote a letter about the earthquake of 29 June 1170.

< 089 >

Amiras of Erznka [Arm.]

The author of an unpublished Armenian chronography, now preserved in the Library of Yerevan (manuscript 10.200), which also includes a list of earthquakes at Erznka (now Erzincan, Turkey).

< 115 > < 184 > < 223 >

Ammannati Piccolomini Iacopo (1422-1479) [Lat.]

An Italian humanist and cardinal, who was born near Lucca (Tuscany). His literary and theological training took place in Florence. In 1450 he became private secretary to cardinal Domenico Capranica. Pope Calixtus III (1455-58) appointed him secretary

of apostolic briefs [*Apostolicorum Diplomatum Scriptor*], and he was confirmed in this position by Pius II, Aeneas Silvius Piccolomini (1458-46). He became one of Pius II's closest collaborators, to the extent that he added the name Piccolomini to his own. In 1460 he was appointed bishop of Pavia and he became a cardinal the following year. His substantial correspondence and his commentaries were published posthumously in 1506. That edition includes 694 letters. A modern amplified edition of his correspondence, edited by Cherubini (1997), includes 987 letters. (310 – 318)

Anagnostes John (early 15th c.) [Gr.]

A Byzantine writer about whose life nothing is known. He wrote an account of the siege of Thessalonica by the sultan Murat II in 1430, which was probably completed after 1453 by another hand. (289)

Andreas von Regensburg (1380 – c.1448) [Lat.]

He was a German Augustinian historiographer. He entered the convent of St. Mang at Ratisbon (Germany) in 1410. (190)

Annales Admuntenses (12th – 13th c.) [Lat.]

Annals compiled at the Benedictine abbey of Admont, in Styria (Austria) drafted by different authors from the second half of the 12th century until 1250. They cover the period 1140-1250. (089)

Annales Arretinorum maiores et minores (14th c.) [Lat.]

These annals cover the most important period in the history of the Commune of Arezzo (Tuscany), and derive from an autograph codex by Marco Alessi (1470-1546), a late humanist from Arezzo. There are two distinct parts which overlap chronologically to some extent, namely the *Annales minores* (1200-1336) and the *Annales maiores* (1192-1343). Up to the year 1287, the information provided by the *Annales maiores* is very sketchy. Only from 1300 onwards is the information sufficiently substantial and detailed as to suggest that we are reading a first-hand account of events which the writer actually saw or was involved in. The *Annales minores* omit a certain number of years before 1319, but the only omissions after that year are 1320 and 1330. The chronicler must have been alive at this time, but probably used an earlier annal source for the period before 1319. (173)

Annales Augustani (late 10th – early 12th c.) [Lat.]

Annals of the years 973-1104, compiled by various canons of Augsburg cathedral (Germany). They are original for the two periods 973-996 and 1055-1104. Published by Freher (1600) as the *Chronica Augustensis* in the *Rerum Germanicarum Scriptores*, and by Pertz (1839) as the *Annales Augustani* in the *Monumenta Germaniae Historica*. (031)

Annales Beneventani monasterii Sanctae Sophiae (11th–12th c.) [Lat.]

These annals are a valuable source for the history of southern Italy. They have survived in three redactions, which are now preserved respectively in codices *Vaticani Latini* 4928 and 4939 in the Biblioteca Apostolica Vaticana, and in some notes in manuscript VI.E.43 in the Biblioteca Nazionale in Naples. All three redactions derive from a common source which is now lost but was also used by other southern Italian chroniclers (Lupus Protospata, Falco Beneventanus, Leo Marsicanus and the anonymous author of the *Chronica S. Mariae de Ferraria*). The first codex (*Vat. Lat.* 4928) contains a redaction of the annals written between 1113 and 1118. The second (*Vat. Lat.* 4939) was compiled in 1119. The codex in the Biblioteca Nazionale in Naples can be dated to between 1099 and 1118. All these codices come from the monastery of S. Sofia at Benevento. (049)

Annales Bergomates (13th c.) [Lat.]

Annals (1156-1245) of the city of Bergamo (Italy), the material being original from 1198 onwards. Published by Finazzi (1868) with the title *Chronicon Bergomense*, and republished by Holder-Egger (1903) in the *Monumenta Germaniae Historica*. < 105 >

Annales Brixienses (12th - 13th c.) [Lat.]

Annals of Brescia (Italy) preserved in three codices, called A, B, and C in Bethmann's edition (1863) for the the *Monumenta Germaniae Historica*. The annals in codex A (1117-1213) were compiled at the abbey of S.Giovanni in the early 13th century, and derive from earlier annals compiled in the 12th century. The annals in codex B (1014-1263) were compiled at the abbey of S.Pietro in Oliveto, and seem to go back to earlier Brescian annals, written from the mid-11th century onwards, but now lost. The annals in codex C (1139-1239) are entirely original annals of the city of Brescia. < 054 > < 105 >

Annales Caesenates (c.1335) [Lat.]

Also called *Chronica Antiqua Civitatis Caesena*. A first version, which can be dated to about 1335, deals specifically with events concerning Cesena and Romagna; whereas a second version (15th c.) embraces events throughout Italy. < 160 > < 200 - 201 >

Annales Casinenses (12th c.) [Lat.]

Pertz (1866) gave this title to the series of annals (1000-1212) recorded in Cassino codices 47, 199 and 851 and Urbino codex 585, compiled by the monks of the Benedictine abbey of Montecassino from the 11th to the 13th century, together with the *Chronicon* (1000-1054), written in the 11th century and attributed by Muratori to a monk named Alberic, who was prior of S.Maria di Albaneta. The *Annales Casinenses* comprise annals covering the periods 1000-1167 and 1000-1152, together with continuations from 1153 to 1182 and 1183 to 1212, and notes to the years 1349, 1362 and 1500. < 054 > < 059 > < 087 > < 093 > < 100 >

Annales Ceccanenses (Chronicon Fossae-novae) (late 12th - early 13th c.) [Lat.]

A chronicle by an unknown author, who lived at or near Ceccano (central Italy). Pertz (1866) thought the author might be Benedetto, a notary employed by count Giovanni di Ceccano, who was the highest local lay authority at the end of the 12th century. This identification was accepted by Toubert (1973) and taken up again by Gasparri (1992). Toubert considered the *Annales Ceccanenses* to be a work of the family chronicle type, though in fact it consists almost entirely of an account of the chief events in the life of count Giovanni di Ceccano, who died in 1224 or 1227. The account is primarily concerned with the efforts of count Giovanni and other local lords to resist the penetration of the region by German forces under the emperor Henry VI. The work is preserved in 17th century manuscript codices. < 054 > < 081 - 082 > < 088 >

Annales Colonienses Maximi *sec Chronica Regia Coloniensis*

Annales Corbeienses (early 9th c. - early 12th c.) [Lat.]

Annals compiled at the Benedictine monastery of St.Peter at Corvey (in the diocese of Paderborn, in present-day Germany). They cover the period from 822 to 1117. < 025 >

Annales Cremonenses (12th - 13th c.) [Lat.]

Annals of Cremona (Italy), from 1096 up to 1270, compiled from the mid-12th century onwards by various contemporary authors. The first part (1096-1159) derives from earlier Cremonese annals, now lost, which had been compiled from the beginning of the 12th century onwards. Published in part by Muratori (1725) in the *Rerum Italicarum Scriptores* with the title *Chronicon breve Cremonense*, and by Jaffé (1863) in the the

Monumenta Germaniae Historica, and later entirely re-edited by Holder-Egger (1903) in the same collection (see below *Supplementum*). (054) (105)

Annales de Margan (13th c.) [Lat.]

Annals (1066-1232) compiled at the Cistercian abbey of Margan (in Wales, Great Britain) and covering the period 1066-1232. A complete edition was published by Luard (1864) in the *Rerum Britannicarum Medii Aevi Scriptores*, and part was published by Liebermann (1885) in the the *Monumenta Germaniae Historica*. (105)

Annales Dunstapenses (13th c.) [Lat.]

Annals of the period from the birth of Christ to 1297, compiled in the Augustinian monastery at Dunstable (England). The information provided up to 1201 is sketchy, but then becomes more substantial, especially for the years 1201-1242, which prove to have been written by prior Richard de Morins. The annals were published by Hearne (1733) as *Chronicon sive Annales prioratus de Dunstaple*, and republished by Luard (1866) in the *Rerum Britannicarum Medii Aevi Scriptores*. A partial republication by Pauli (1885) appears in the the *Monumenta Germaniae Historica*. (105)

Annales de Raimo (15th – early 16th c.) [It.]

These annals are concerned with the history of the Kingdom of Naples, and were written by various members of the Raimo family. It seems that they were begun by Fronzone di Raimo or another member of the family, who lived in the second half of the 14th century and the first half of the 15th. They were continued by Lancellotto (or Lanzillotto), a knight of St. John of Jerusalem, and by Ludovico senior and junior, in the second half of the 15th century and the early 16th. They cover the period from 1197 (or 1250, in some copies) to 1487 (some manuscripts have additions up to 1503). They were published by Muratori in *Rerum Italicarum Scriptores* (1733), but on the basis of an incomplete codex with some interpolations by Antonio d' Afeltro, and were republished in 1780, in an even more corrupt form, by Pelliccia with the title *Diario anonimo dall'anno 1193 all'anno 1487*. (336)

Annales de Terre Sainte (first half of the 14th c.) [Fr.]

Annals compiled by an anonymous Frenchman. Extremely valuable as one of the few available sources for the period 1277-1291: i.e. the closing years of the Latin presence in the Holy Land. For earlier years, it depends heavily on information from William of Tyre and the *Estoire d'Eracles empereur* (see below). (097)

Annales Dorenses (13th c.) [Lat.]

These annals of the Cistercian abbey of Dore (founded in 1147 in the diocese of Hereford, England), record historical information from the birth of Christ to the year 1283, with later annotations by various hands up to the year 1362. The homogeneous style of the narrative up to the 13th century suggests that it was written by a single hand. The annals were published by Liebermann and Pauli (1885) in the *Monumenta Germaniae Historica*. (105)

Annales Ensdorfenses (12th – 14th c.) [Lat.]

A compilation by a number of authors at the Benedictine monastery of St. James at Ensdorf in the diocese of Regensburg (Germany), covering the period 1184-1368. (190)

Annales Estenses see Delayto Giacomo

Annales Ferrarienses (12th – early 13th c.) [Lat.]

Brief annals (1101-1211) of the city of Ferrara (Italy) which are contemporary with the

events recorded. In preparing the edition of the *Chronicon Parmense* for the *Monumenta Germaniae Historica*, Jaffé (1863) set aside this single-page text, attributing it to Ferrarese chronicle circles. The published edition is based on the 14th century manuscript 1162 in the Biblioteca Palatina at Parma. (054)

Annales Floreffenses (late 15th c.) [Lat.]

Annals compiled at the abbey of Floreffe (near Namur, in Belgium) on the basis of 12th century material. It includes information from ancient times up to 1492. (089)

Annales Forolivienses (third quarter of the 15th c.) [Lat.]

The work of an anonymous compiler who brought together in a single volume a variety of sources concerning the history of Forlì (Italy) from its origins to 1473. An important source, especially for events between 1275 and 1473. (232) (320 – 323) (325 – 332)

Annales Frisacenses (early 16th c.) [Lat.]

Annals of the monastery of St. Stephen at Friesach in Carinthia (Austria), taken from the *Annales Praedicatorum Vindoboniensium*, whose order was at Friesach about the year 1300. They cover the years 1217 to 1300, with continuations for the years 1348, 1384 and 1492, and are to be found in codex 143 (early 16th c.) in the Stadtbibliothek in Augsburg (Germany). (190)

Annales Gastinenses (12th – 13th c.) [Lat.]

Shortened version of the *Annales Uticensis*, continued from 1161 to 1226 by the Benedictine monks of the abbey of Gâtines (France). (089)

Annales Hildesheimenses (12th c.) [Lat.]

Annals covering the years 1 AD – 1137. For the period 1109-1137 they derive from the original part of a lost source for the *Annales Patherbrunnenses*, compiled in the Benedictine monastery of St. Peter and St. Paul at Paderborn (Germany). They were published by Duchesne (1641), republished by Pertz (1839) in the *Monumenta Germaniae Historica*, and then published again by Waitz in vol.8 (1878) of the *Scriptores Rerum Germanicarum*. (054)

Annales Ianuenses (second half of the 13th c.) [Lat.]

Annals of the city of Genoa (Italy) by various hands. The part covering the years 1270-1279 is by Oberto Stancone, Iacopo d'Oria, Marchisino di Cassino and Bertolino di Bonifacio. The Commune of Genoa had established that from 1264 the task of compiling the city's annals should be entrusted to four chroniclers nominated by the government, two of whom were to be juriconsults. Oberto Stancone and Iacopo d'Oria belonged to noble Genoese families. D'Oria was also appointed keeper of the public archive, and so undertook the task of sorting out and commenting on earlier city annals. Marchesino di Cassino and Bertolino di Bonifacio were the two juriconsults. They had at their disposal first-hand and very authoritative sources; and they very often had personal knowledge of what they reported. (124)

Annales Magdeburgenses (15th c.) [Lat.]

Compiled in the monastery of Kloster Berge, near Magdeburg (Germany). They cover the period from the birth of Christ to 1188, and continuations reach the mid-15th c. (089)

Annales Mantuani (late 12th – 13th c.) [Lat.]

Annals (1183-1299) of the city of Mantua (Italy), composed from the late 12th century onwards. Published by d'Arco (1855) with the title *Breve Chronicon Mantuanum*, and republished by Pertz (1866) in the *Monumenta Germaniae Historica*. (105)

Annales Matseenses (14th c.) [Lat.]

This name is given to the last part of a larger chronicle written around 1358-1363 by Christian Gold, a canon of the Benedictine monastery of St. Michael at Mattsee in the diocese of Passau, near Salzburg (Austria). It concerns events between 1305 and 1395. For events before 1363, the author used other sources. (190)

Annales Mechovienses (14th - 15th c.) [Lat.]

Annals compiled by various hands at the end of the 14th and the beginning of the 15th century at the monastery of the Holy Sepulchre at Miechow, in the diocese of Kracow (Poland). It covers events between 947 and 1434. The record of events from the 10th to the 13th century is taken from earlier annals. (190)

Annales Mediolanenses breves (c.1228) [Lat.]

Annals (1104-1228) compiled at Milan by a single anonymous author about 1228. Information about the 12th century derives from Milanese annals which are now lost. Published by de Levis (1789) with the title *Chronicon I Mediolanense*, and republished by Jaffé (1863) in the *Monumenta Germaniae Historica*. (054) (105)

Annales Mediolanenses brevissimi (13th c.) [Lat.]

For the 12th century, these annals (1111-1237) derive from a lost source also used by the *Annales Mediolanenses breves*. Published by Baluze (1679), and republished by Jaffé (1863) in the *Monumenta Germaniae Historica*. (054)

Annales Mediolanenses minores (13th c.) [Lat.]

Short annals of the city of Milan containing information about the history of the city from the year 750 up to 1280. They derive from lost Milanese annals which were also used by the *Annales Mediolanenses breves* and the *Notae S. Georgii Mediolanensis*. They were published by Jaffé (1863) in the *Monumenta Germaniae Historica*. (054)

Annales Mellicenses. Continuatio Lambacensis (12th - 14th c.) [Lat.]

Annals of the Benedictine abbey of Lambach in the diocese of Passau (Austria), compiled by various hands at various times. They record events from 1197 to 1283, together with information about the years 1330 and 1348. (190)

Annales Mellicenses. Continuatio Mellicensis (12th - 16th c.) [Lat.]

Annals from the monastery of Melk in the diocese of Passau (Austria), which continue the *Annales Mellicenses* from 1124 to 1564. (190)

Annales Parmenses minores (12th c.) [Lat.]

Brief annals of Parma (Italy), consisting of sketchy reports of famine, earthquakes and war in the period 1038-1167. Nothing is known of the author. They were given the title *Annales Parmenses minores* in the edition by Jaffé (1863) for the *Monumenta Germaniae Historica*, because he thought they were independent of the Parma chronicle tradition. In the new edition of the *Rerum Italicarum Scriptores*, however, Bonazzi (1902-1904) placed this text at the beginning of the *Chronicon Parmense*. (054)

Annales Pisani see Maragone Bernardo

Annales Pisani antiquissimi (11th - early 12th c.) [Lat.]

These are brief notes in annal form concerning the city of Pisa and the Pisan wars in the Mediterranean between 1004 and 1117. They were transcribed by a 12th century librarian into manuscript LXXIX in the Biblioteca Statale in Cremona. This is a 12th century codex from the monastery of S. Agostino. According to Novati (1910), who first

edited and published them, these notes derive from contemporary 11th – 12th century sources. (055)

Annales Placentini Gibellini (13th c.) [Lat.]

Annals compiled by an anonymous chronicler from Piacenza (Italy), who lived in the second half of the 13th century. (124) (132)

Annales Ratisponenses (12th c.) [Lat.]

Annals (1-1167) compiled at the Benedictine monastery of Ratisbon (Regensburg, Germany). The information up to 1130 derives in part from lost Ratisbon annals. (025)

Annales Reatini (15th c.) [Lat.]

Bethmann (1866) found these annals in codex Vaticanus Latinus 5994. The text records events at Rieti (Italy) between 1054 and 1377. Events after 1368 were recorded by a single hand in the 15th century. For events before that year the author used an earlier codex compiled by more than one hand. (192 – 196)

Annales Remenses et Colonienses (first half of the 12th c.) [Lat.]

These annals (967-1150) seem to derive from lost annals of Rheims (France) which were also used in the *Annales S.Dionysii Remenses*. They were continued up to the year 1196. Published by Pertz (1859) in the *Monumenta Germaniae Historica*. (054) (105)

Annales S.Blasii in Nigra Silva (11th – 15th c.) [Lat.]

From the Benedictine monastery of St-Blasien (in the diocese of Constance, Germany), a series of annals original from the late 11th – early 12th century. (054)

Annales S.Dionysii Remenses (second half of the 12th c.) [Lat.]

Annals (845-1190) compiled at the Augustinian monastery of St-Denis at Rheims (France). They are original for the period from the second half of the 12th century onwards, and for the preceding period, they derive from Rheims cathedral annals, now lost. Published by Labbe (1657) under the title *Chronicon breve Remense*, and republished by Waitz (1881) in the *Monumenta Germaniae Historica*. (054)

Annales S.Disibodi (12th c.) [Lat.]

Annals (891-1200) compiled around 1125-1147 by a Benedictine monk at Disibodenberg (in the diocese of Mainz, Germany), and continued by other monks up to the end of the 12th century. Published as early as 1559, and republished by Waitz (1861) in the *Monumenta Germaniae Historica*. (054)

Annales S.Emmerammi Ratisponensis (first half of the 11th c.) [Lat.]

Brief annals compiled at the Benedictine monastery at Ratisbon (Regensburg, Germany). They cover the period from 1036 to 1048. (025)

Annales S.Iacobi Leodiensis minores (late 11th – late 14th c.) [Lat.]

Annals (1-1393) compiled at the Benedictine abbey of St-Jacques in Liège (Belgium), the material from 1087 onwards being original. Published by Bethmann (1859) in the *Monumenta Germaniae Historica*. (087)

Annales S.Iustinae Patavini see *Chronicon Marchiae Tarvisinae et Lombardiae*

Annales S.Rudberti Salisburgenses (12th – 13th c.) [Lat.]

From Salzburg cathedral (Austria), original from 1186 onwards; the report of the 1117 earthquake derives from old Salzburg annals which are now lost. (054)

Annales S. Stephani Frisingenses (11th – 15th c.) [Lat.]

Annals compiled in the Benedictine monastery of Weihenstephan near Freising (Germany) for the years 711-1380, 1472 and 1488. Brief historical notes up to the 11th century were added by various hands, at first simply giving the names of the Roman emperors, but later on providing a few notes about the Frankish kings from 711 to 743. Until the year 938 nothing was added in the margins, but in the 11th century the names of the bishops of Freising were recorded. From 1021 onwards, after the restoration of the monastery of St. Stephen, the names of the abbots were recorded, as well as outstanding events. (054) (190)

Annales S. Trinitatis Veronenses (12th – early 13th c.) [Lat.]

Annals (1117-1223) from the monastery of S. Trinità in Verona (Italy), compiled from the second half of the 12th century onwards. The material is entirely original. Published by Biancolini (1760), and republished by Pertz (1866) in the *Monumenta Germaniae Historica*. (054) (105)

Annales Scheftarienses maiores (11th – 13th c.) [Lat.]

Annals compiled at Schaftlarn, near Freising (Germany). They cover the period between 1092 and 1248. (105)

Annales Urbevetani (13th – 14th c.) [Lat.]

This is the title given to two chronicles and some chronicle fragments on the history of Orvieto (Italy) which Fumi published in the second edition of the *Rerum Italicarum Scriptores* (1902). The first chronicle, entitled *Cronica antiqua*, covers the period 1161-1313; the second, entitled *Cronica potestatum*, covers the period 1194-1332. Both chronicles are original from the last quarter of the 13th century onwards. For the earlier period they rely on lost annals of the town of Orvieto. (130)

Annales Venetici breves (late 11th - 12th c.) [Lat.]

Brief annals (1062-1195) of the city of Venice, compiled in the early 13th century. They are original for the period from the end of the 11th century onwards. Published by Simonsfeld (1876), and republished by him in the *Monumenta Germaniae Historica* (1883). (054)

Annales Veronenses antiqui (second half of the 13th c.) [Lat.]

Annals of the city of Verona (Italy) from 1 AD up to 1251, written in the second half of the 13th century, and deriving largely from a common source, now lost, which was compiled from the end of the 12th century onwards. Published by Cipolla (1908) on the basis of a manuscript in the Archivio Capitolare of the cathedral at Sarzana (La Spezia, northern Italy). (054) (105)

Annales Veronenses breves (12th c.) [Lat.]

Annals (1095-1178) deriving from earlier Verona (Italy) cathedral annals, now lost. Published by Pertz (1866) in the *Monumenta Germaniae Historica*. (054)

Annales [Veronenses] veteres (late 13th c.) [Lat.]

Annals of the city of Verona (1 AD – 1250), written in the late 13th century, and deriving largely from a common source, now lost, which was compiled from the end of the 12th century onwards. (054) (105)

Annales veteres Mutinensium (12th – 14th c.) [Lat.]

Annals of the city of Modena (Italy) covering the period from 1131 to 1336, with addi-

tions from 1336 to 1500. Their record of events in the city was compiled by early writers, sometimes working contemporaneously. (190) (248)

Annales Vizeliacenses (mid-12th – mid-14th c.) [Lat.]

Annals (1-1343) compiled at the Benedictine abbey of Vézelay (in the diocese of Autun, in central France). Its material is original for the mid-12th century onwards. Was drafted by a first author until the year 1168 and was continued until 1343. Published by Huygens (1976) in the collection entitled *Corpus Christianorum. Continuatio Mediaevalis*. (087) (089)

Annales Windbergenses (14th – 15th c.) [Lat.]

Annals compiled in the monastery of St. Mary of Windberg in the diocese of Regensburg (Germany). The text is contained in two 14th and 15th century codices, and records events from 1196 to 1393, together with information about 1407. (190)

Annales Wratislavienses maiores (late 14th c.) [Lat.]

Annals of the monastery at Breslau (Slovakia), covering the period 1230-1371. The two parchment sheets added at the end were written by an anonymous author in the second half of the 14th century. Published by Arndt (1866) in the *Monumenta Germaniae Historica*. (190)

Annales Zwetlenses (14th c.) [Lat.]

Annals compiled in the monastery at Zwettl in the diocese of Passau (Austria). They record events from the year 1 to 1349. For the years from 1241 to 1329 the anonymous compiler took his information from the *Annales Mellicenses*. (190)

Annales Zwetlenses. Continuatio Zwetlensis IV (14th c.) [Lat.]

Annals from the Cistercian monastery at Zwettl in the diocese of Passau (Austria). The text derives from a broader based and wider ranging compilation, recording events from 1348 to 1362 and in 1386. (190)

Annales Zwifaltenses (late 11th – early 16th c.) [Lat.]

Annals (1-1503) compiled at the Benedictine monastery of St. Mary at Zwiefalten in the diocese of Constance (Germany). They are original for the period from the end of the 11th century onwards. Two versions have survived. Published by Hess (1784), and republished by Abel (1852) in the *Monumenta Germaniae Historica*. (054)

Annali e cronaca di Perugia in volgare dal 1191 al 1336 (14th c.) [It.]

These annals contain a collection of items of news and events concerning the city of Perugia (Italy) in the late 12th and first half of the 13th century. The text provides a reliable record of events in central Italy in those two centuries; and the vernacular Italian in which it is written makes a contribution to the history of the Italian language. (173)

Annalium Austriaricorum Continuatio Claustroneoburgensis V (14th – 15th c.) [Lat.]

Wattenbach (1851) gave this title to the annals compiled at the monastery of Klosterneuburg in the diocese of Passau (Austria) in the 14th and 15th centuries. They record events from 1307 to 1455. (190)

Annalium Mellicensium Continuatio Claustroneoburgensis II (12th c.) [Lat.]

A continuation of the *Annales Mellicenses* (see above) containing an account of events between 1142 and 1224. (105)

***Annalium Mellicensium Continuatio Novimontensis* (14th c.) [Lat.]**

Annals compiled by the monks of the Cistercian abbey of Neuberg in the diocese of Murz (Austria). It records events from 1329 to 1355, with some information about 1396. < 190 >

Anonymous, *La città di Monza* (18th c.) [It.]

An anonymous Lombard chronicle concerning the town of Monza (near Milan). It was discovered amongst the papers of the Mezzotti family of Castellambro. < 243 >

Anonymous, *Ta'rikkh* (13th-14th c.) [Arab.]

An unidentified Egyptian writer, who was at Minya (Egypt) at the time of the 1303 earthquake. Of particular interest is his vivid description of effects in the mountains surrounding Minya, and on the waters of the Nile. < 160 >

Anonymus Leobensis [*Chronicon*] (14th c.) [Lat. Ger.]

The work was first published by Pez (1721), who gave the author this name because he thought he was a monk of the Order of Preachers at Leoben, in Upper Styria (Austria). It is now thought that the chronicle was written at Vienna or Kröms, where the same Order of Preachers had a convent. The chronicle is in Latin, and comes down to 1343; but there is a continuation in Latin up to 1346 and in Old German up to 1348. < 190 >

Anselm of Gembloux (died 1136) [Lat.]

He was abbot of the Benedictine monastery at Gembloux (Belgium) from 1113 to 1136, and wrote the first *Continuatio* (1112-1135) of the *Chronographia* of Sigebert of Gembloux (who died in 1112). This *Continuatio* was published by Bethmann (1844) in the *Monumenta Germaniae Historica*. < 051 >

al-Antaki, Abu'l-Faraj Yahya b. Sa'id (al-Antaki) (980?-1066) [Arab.]

An Egyptian historian and doctor, who was a Melchite Christian. He is known for his continuation of the *Chronicle* of Eutychius of Alexandria. He spent the first forty years of his life in Egypt, but from 1014 onwards was in Antioch, then a Byzantine possession. His sources are Islamic, Greek and Antiochene Christian. < 009 > < 012 >

Antonio da Trezzo (15th c.) [It.]

At the time of the earthquake of 5 December 1456, he was ambassador in Naples for Francesco Sforza, duke of Milan, to whom he sent three letters and a report about the earthquake between 6 and 28 December 1456. The letters of 6, 22 and 28 December were published in Motta (1887, pp.151-2, p.153, pp.153-4), and re-edited by Senatore (1997, no.177, pp.464-5, no.178, pp.466-7, no.181, pp.470-2. < 310 - 318 > < 336 >

Appendix to the *Chronica per l'anno 1349* (14th c.) [Lat.]

The appendix for the year 1349 was written at the abbey of Montecassino, and is to be found inserted at the end of the Cassinese chronicle entitled *Rerum in regno Neapolitano gestarum, breve chronicon*. It was published by Muratori (1724) in the *Rerum Italicarum Scriptores*. < 192 - 196 >

Arakel of Tabriz (Arak'el Dawrizec'i) (17th c.) [Arm.]

An Armenian historian whose *Book of histories* records events in Armenia from 1602 to 1662. Some chapters based on other sources are included as an appendix. Chapter 56 (pp.467-89 of the critical edition) is effectively a chronography, much like many other *Chronica minora* (see below), recording events from year 10 of the Armenian era (561 - 562 AD) to the year 1615. Some items of information about earthquakes at Erzincan are taken from Amiras of Erzinka (see above), and there are many parallels with Gregory of Kamakh (see below). < 204 >

Armenian colophons and *notulae* (12th – 15th c.) [Arm.]

Armenian authors are noteworthy for their tendency to compile very long colophons, called *y'atakan* [= memorials] in accordance with their tradition of learning. Current editions, though very rich in material, are not quite complete. Some *notulae* have been published by Hakobyan (1951, 27; 1956, 25): cf. *Chronica minora* (Armenian). < 056 > < 068 > < 099 > < 142 > < 204 > < 258 > < 259 > < 299 > < 319 > < 365 >

Arnulf of Milan (late 10th c. – after 1077) [Lat.]

He was one of the most eminent historians of early medieval Italy. He was a great grandson of the brother of Arnulf I of Arzago, archbishop of Milan (970-974), and belonged to the aristocratic class of the captains. His profound knowledge of holy scripture and church archives suggests that he was an ecclesiastic. In 1072 he began writing his *Gesta archiepiscoporum Mediolanensium* (republished as *Liber gestorum recentium*), which is a chronicle of the history of Milan from 925 to 1077. From 1018 he was recording events within his own experience, and he also made use of documents from Milanese Church archives. After 1077 he resumed his chronicle and added two more books to the original three. Book IV deals with events in Milan up to 1075, and book V ends with the election of Tebaldo as archbishop of Milan, events at Canossa, and the election of the anti-king Rudolf of Swabia (1077). < 031 >

Athanasius I (c.1235 – c.1315) [Gr.]

Patriarch of Constantinople (who was born at Adrianople). He was patriarch for the years 1289-1293 and 1303-1309, and died at Constantinople. An important figure in late Byzantine religious life. His correspondence is of great documentary value.

< 157 >

Attaliates Michael (c.1020/1030 – after c.1079) [Gr.]

A Byzantine historian (who was born at Constantinople or Attalia). His historical work dealing with the period 1034-1079/80 uses primary sources, and shows a considerable interest in the naturalistic aspect of events. < 003 – 004 > < 029 > < 030 > < 032 >

Auctarium Zwettlenses (1024-1160) [Lat.]

From the Cistercian monastery at Zwettl, in the diocese of Passau (Austria), partial continuation of the *Annales Mellicenses* (see above). The earthquake of 1117 is wrongly dated to 1116. < 054 >

Averroes see Ibn Rushd

al-'Ayni, Abu Muhammad Mahmud b. Ahmad b. Musa Badr al-Din (1361-1451) [Arab.]

A Turkish historian, who also wrote in Arabic. He was born and died at 'Ayntab (Turkey). He was a public official, textual scholar and expert in canonical traditions, and left a general history, whose many sources have not yet been identified or are not directly accessible. As a man of letters, a mystic and an intellectual, he was close to the Mamluk sultans, whom he served in a variety of positions at different times in his career. He was particularly famous for a general history entitled *Iqd al-juman fi ta'rikh ahl al-zaman*, a commentary on the *Alfiyya* of Ibn Malik and his great commentary in the margin of the *Sahih* of Bukhari. < 118 > < 123 > < 128 > < 160 > < 182 > < 255 – 256 > < 274 > < 275 > < 281 >

Azario Pietro (1312 – after 1366) [Lat.]

He was a Lombard notary, who studied law at Novara and Milan (Italy). At the time of the plague in 1348, he was at Borgomanero in the service of the Visconti. After 1350 he was in Bologna working as a notary in the administrative office of the mercenary companies which controlled the city. In 1362 he was in Tortona, where he remained for several years. It was here that he began and completed his *Liber gestorum in*

Lombardia, in which he set out events in northern Italy and Milan in particular between 1250 and 1364. < 200 - 201 >

Bar Hebraeus, Gregory Abu'l- Faraj (1225-1286) [Syr.]

The great west Syrian polyhistor who became bishop of Aleppo in 1246 and maphrian of the Jacobite Church in Tagrit (Persia) in 1264. He wrote a famous world history, divided into two parts: a) a secular history, usually called *Chronicon*, from Adam to his own times; and b) an ecclesiastical history, *Chronicon Ecclesiasticum*, also divided into two parts. It reaches 1286, and was later continued by his brother Bar Sauma to 1297, and then by an anonymous historian to 1496. For their source the works of Bar Hebraeus depend largely on Michael the Syrian (see below), but they are very different in form. < 012 > < 056 > < 068 > < 123 > < 128 > < 138 >

Bartolf of Nangis (12th c.) [Lat.]

Nothing is known of his life. He was apparently writing in Syria in the early 12th century. Around 1108 he reworked Fulk of Chartres's work known as the *Historia Hierosolimitana* or *Gesta Francorum*, adding information about the Holy Land. < 046 >

Bartolomeo da Ferrara see Nicolò da Ferrara

Bartolomeo del Corazza (1381-1449) [It.]

A Florentine wine merchant, who held managerial office in the guild of wine sellers. In 1434 he withdrew from that trade and held certain paid posts in public service. He wrote a private diary about events in Florence from 1405 to 1438. Though it does record the main political events of the time, the diary is primarily concerned with ceremonies, feast days and festivities, in line with the popular nature of the work and the status of its author. It was published by Muratori in 1731 as an anonymous *Historia Florentina* on the basis of a 17th century manuscript codex in the Biblioteca Estense in Modena. Later on the author was identified as the wine merchant Bartolomeo di Michele del Corazza, and Corazzini (1894) republished the diary, collating the Este text used by Muratori with a copy of the work preserved in a Strozzi manuscript codex in Florence. < 270 >

Bartolomeo Fiadoni see Tolomeo da Lucca

Battagli Marco (first decade of the 14th c. - after 1376) [Lat.]

He was a 14th century jurist from Rimini (Italy). In his early youth he went to Coimbra (Portugal) in the company of his paternal uncle Gozio, a professor of law at the university there, and stayed for about five years, from 1318 to 1323. From Coimbra he accompanied his uncle again to Avignon, but then left him to return home. From 1338 onwards, Marco took an active part in the political life of Rimini, where he was elected to the council on a number of occasions. He wrote a chronicle in 5 books called *Marcha*, which narrates events from the creation of the world to 1354, and is dedicated to Charles IV of Bohemia. The first four books are a schematic compilation from well-known sources, but as he approaches contemporary events, the account becomes more lively and detailed. < 200 - 201 >

Benjamin of Tudela (Benjamin bar Jonah) (12th c.) [Hebr.]

A Spanish rabbi. His *Massa'oth* is a diary of his wanderings between 1160 and 1173 from Spain across the Tyrrhenian coast of Italy to eastern Mediterranean lands. It is a fundamental source of information regarding the distribution of Jewish communities in the Mediterranean area, as well as for the political situation in the Holy Land. < 089 >

Bernardi Andrea (*Novacula*) (1450-1522) [It.]

He was born in Bologna (Italy) and moved to Forlì in 1470. It was here that, some time later, he began writing his *Cronache Forlivesi*, which narrates events of the author's own lifetime (from 1476 to 1517), paying particular attention to the history of Forlì. The nickname *Novacula* derives from the fact that he worked as a barber as well as being a historiographer. He held various magisterial posts in the town, and when the prince Cesare Borgia governed the city briefly in 1500, he exempted Bernardi from all taxes. His works are preserved in two autograph manuscript codices, the first of which is preserved in the Biblioteca Comunale in Forlì (a number of leaves are missing), and the second in the Bibliothèque Nationale de France. (369)

Berthold of Zwiefalten (d. 1169) [Lat.]

Abbot of the Benedictine monastery of St. Mary at Zwiefalten (in the diocese of Constance in Germany). Around 1137-38 he wrote the *Chronicon monasterii Zwifaltensis*, which spans the years 1089-1138. The chronicle was published by Abel (1852) in the *Monumenta Germaniae Historica*, and republished by König and Müller (1941) in the *Schwäbische Chroniken der Stauferzeit*. (054)

Bianchi Jacopino de', known as Lancellotti (1440 - c.1502) [It]

He was enrolled in the guild of spice merchants, and in 1500 was appointed one of the *savi* of the city of Modena (Italy). He wrote a *Cronaca modenese* covering the period 1469-1502, which has come down to us in an autograph manuscript consisting of preparatory notes for the final work, as is indicated by annotations and inaccuracies in the text. Since de' Bianchi deals primarily with events in Modena and its surroundings in his own lifetime, his work is a reliable primary source. It was continued by his son Tommasino for the period 1506-1554. (352 - 354)

Bindi Bindo (15th c.) [It]

In early November 1456, he was appointed ambassador of the Republic of Siena at Naples, and therefore personally experienced the earthquake of 5 December, one month after he took up his post. He wrote a letter about it to the Sienese authorities on 7 December 1456. The letter was published with omissions and imperfections in De Blasiis (1885, pp.349-52), and has been republished by Figliuolo (1989, pp.9-11, doc.I) on the basis of a copy in the Bibliothèque Nationale de France (*ms. ital.* 1587, fols.151r.-152v.). (310 - 318)

Bolognino della Marcanzia (15th c.) [It.]

His name appears as author of a *Cronaca di Bologna [...] dal 1238 al 1443*, but nothing is known of his life. The manuscript is in the Biblioteca Universitaria in Bologna (81, no.6). (291)

Bonaventura di Benvenuto (13th - 14th c.) [Lat.]

A notary, who wrote the earliest chronicle source for the town of Foligno (central Italy). Scarcely anything is known of his life, but his name appears in the Statutes of the College of Judges and Notaries of Foligno at 6 August 1346. He was employed in local government, and his chronicle reveals that he had a direct knowledge of financial affairs and used various sources from the archive of the Commune of Foligno. Bonaventura's entire known output is preserved in manuscript B.II.23 in the Seminary Library at Foligno. The codex in question has been published only in part. The list of *podestà* with items of local history from 1198 to 1341 first of all became one of the *Fragmenta Fulginatis Historia* which Muratori included in the appendix to the *XLVI dissertationes* of the *Antiquitates Italicae Medii Aevi* in 1741. (132) (173)

Bonaventura of Bagnoregio (Giovanni Fidenza) (1217-1274) [Lat.]

He was born at Bagnoregio (Viterbo, central Italy). In 1236 he went to Paris to complete his studies and decided to enter the Franciscan order around 1243, concentrating on the study of philosophy and theology. In 1257 he became minister general of the Franciscan order. In 1265 he was nominated archbishop of York, and in 1273 he was made cardinal and entrusted with preparations for the Council of Lyons, but his death on 14 July 1274 prevented him from completing this work. In addition to his theological writings he was author of two official biographies of St. Francis: the *Legenda maior* and the *Legenda minor*. (105)

Bonifacio da Morano (end of the 13th c. - 1349) [Lat.]

He was a notary and judge from Modena (Italy), who is well known as the author of the *Chronicon Mutinense*, which deals with events in the history of Modena from 1188 to 1347. In 1348 he was one of the revisers of the city statutes. In 1349 he was taken to the infirmary of the convent of S. Francesco in Modena, where he died of the plague. He was in contact with Giovanni da Bazzano, a notary and author of a chronicle of Modena. There are clear affinities between the chronicles of Bonifacio and Giovanni, and it seems likely that they both derive from an early source which is now lost. (171)

Bonincontri Lorenzo (1410 - after 1502) [Lat.]

He was born at San Miniato (Tuscany), lived in Naples from 1450 to 1475, in Florence from 1475 to 1478 and in Rome from 1483 to 1491. He was interested in matters of astrology. He wrote a history of the Kingdom of Naples and a *Chronicon* covering the period from 903 to 1458, which was published by Muratori (1732) in the *Rerum Italicarum Scriptores*. (310 - 318)

Boquet Pere (15th c.) [Cat.]

A Catalan jurist. At the time of the earthquake of 5 December 1456 he was ambassador in Naples for Barcelona city council, to which he wrote two letters about the earthquake. They are dated 8-9 December 1456 and 31 March 1457, and have both been published in Madurell Marimon (1963, pp.544-5 and pp.573-5). (310 - 318)

Bozner Chronik (14th c.) [Ger.]

This chronicle in German survives in two manuscript copies and is primarily concerned with events at the city of Bolzano (Italy). It was written by an anonymous monk from the Benedictine monastery at Bolzano who narrates events in the period 1338-1341/42 as though he had personally experienced them. Unsystematic additions of later events are by a different author. It has been suggested that up to the years 1341/42 the chronicle was compiled by Heinrich, the abbot of the monastery, who in fact died in 1341-42, and that the additions were compiled by his successor, Johan. (190)

el-Brechki (14th c.) [Arab.]

An Arab traveller, who was at Algiers when the 1365 earthquake struck. (209)

Buccio di Ranallo (end of the 13th c. - 1363) [It.]

A poet from L'Aquila (central Italy). In 1328 he was one of the citizens of L'Aquila sent by the duke of Calabria to the pass of Anticoli to resist Louis of Bavaria. In 1350 he went to Rome for the Jubilee. In 1355 he supported the government of L'Aquila by the five guilds. In 1361 he was a member of the town council. He wrote a verse *Cronaca Aquilana*, in which he celebrates events in the history of L'Aquila from the foundation of the city in 1254 to 1362. From 1310 onwards he speaks in the first person plural and reports events of which he had first-hand knowledge. (168) (192 - 196)

Buoninsegni Domenico (c.1384-1466) [It.]

He belonged to an ancient Florentine family which had made its fortune in commerce and industry, and had connections with the humanist circle of Niccolò Niccoli, Roberto de' Rossi and Ermolao Barbaro. After taking an active part in the economic and political life of Florence, Buoninsegni appears to have suffered a financial disaster. He devoted the last decade of his life to completing his *Historia Florentina*, which records events from 1410 to 1460. Although his aim was to make a compilation of already existing chronicles of Florence rather than to compose an original work, the last part records events of his own lifetime. The principal sources of the *Historia* are: the Villani chronicles, the *Cronica volgare* by an anonymous Florentine, the *Priorista Fiorentino* by Pietro Pietribuoni, and Bruni's works. The work is preserved in various manuscripts, the three earliest of which are copies authorised by Buoninsegni's younger son Pietro, now in the Biblioteca Nazionale in Florence. < 270 > < 303 - 304 >

Butrus, Pseudo-Butrus (Petrus) b. al-Rahib (13th c.) [Arab.]

A Coptic Christian historian. His world chronicle, written in Arabic (c.1260), is commonly known as *Chronicon Orientale*. He is often wrongly identified with Petrus al-Rahib, who is mentioned as a source in the histories of al-Makin and al-Maqrizi (see below). The chronicle consists of several synchronic calendars from the Old Testament era and the Roman emperors down to the time of Mohammed. The second part deals in particular with events in Islamic Syria and Egypt until the time of the Ayyubid Sultan Nur al-Din 'Ali (1259). It also contains a church history of the patriarchs of Alexandria up to the year 1261. < 048 >

Byzantine colophons and notulae [Gr.]

A selection of colophons containing information about disasters and prodigious events was published (not always in a very accurate way) by Lampros (1910), together with a number of other miscellaneous notes from various Greek manuscripts: nos.22, 39, 73, 116. < 091 > < 149 - 150 > < 225 > < 296 >

Other *notulae*, which had already been published here and there, were republished by Schreiner (1975-79), but without his undertaking a real re-examination of all the documents (see also *Chronica minora Byzantine* 81-109). < 104 > < 108 > < 230 > < 252 >

Other *notulae* up to the 13th century had been published by Evangelatou-Notara (1982, 1984). < 087 > < 091 > < 116 > < 148 >

See also Joannou (1958).

< 111 >

Caesarius of Heisterbach (c.1180-1240) [Lat.]

A Cistercian monk, who was born in Cologne (Germany) and studied theology and philosophy. Around 1199 he entered the monastery of Heisterbach (in the diocese of Cologne). The most famous of his numerous works is the *Dialogus miraculorum*, written around 1222. It is a collection of edifying exempla which became one of the most popular works of the time in Germany, and is an important source for the study of the society of the period. < 104 > < 105 >

Calendar of the monastery of Morimondo (13th - 14th c.) [Lat.]

A liturgical calendar compiled in the 13th and 14th centuries at the Morimondo monastery in the province of Milan (Italy). < 162 >

Callistus I (died 1363) [Gr.]

A Byzantine patriarch (1350-1353, 1355-1363).

< 179 - 181 >

Cantacuzenus John VI (c.1293/5 – 1383) [Gr.]

A Byzantine emperor (1347-1354). He wrote his own memoirs in four books of *Historiae*, which cover events from 1320 to 1356, basing himself on personal observations. His work is one of the principal sources for this period. (183) < 203 >

Cantinelli Pietro (13th c.) [Lat.]

An Italian notary and chronicler; he took an active part in the political life of his town, Faenza. In 1278 he represented the Commune of Faenza and the Accarisi family at the Viterbo curia in the presence of pope Nicholas III. On 13 November 1280 he took refuge in Forlì with members of the Accarisi family who escaped a massacre, where he witnessed and described the city's defence against the papal army and the deeds of Guido da Montefeltro. He wrote the *Chronicon Faventinum*, in which he narrates events in Faenza from 1229 to 1294. The autograph codex containing the chronicle is in the Archivio di Stato at Gubbio (*Armanni*, I.C.14). It is in two distinct parts, which differ in material and form. The first part goes up to the year 1274, is strictly Bolognese in content, and events are arranged under successive *podestà* and captains of the people in Bologna. The second part is chiefly concerned with Faenza. When Pietro Cantinelli came into possession of the codex containing the first part, dealing with Bologna, he filled the pages left blank by the first compiler with a chronicle of Faenza. (132) < 133 >

Casola Pietro (1427-1507) [Ital.]

An Italian cleric. He took service with the duke of Milan, who sent him to the Roman curia, where he remained for sixteen years. He left a diary of a journey to Jerusalem, undertaken in 1494. (375) < 378 – 379 >

Casus monasterii Petrishusensis (mid-12th century) [Lat.]

A chronicle (c.955-1165) from the Benedictine monastery of St. Peter at Petershausen, near Constance (Germany), compiled towards the mid-12th century. Published by Abel and Weiland (1869) in the *Monumenta Germaniae Historica*. (054)

Catalogus imperatorum et pontificum (ex codice Veneto) (13th c.) [Lat.]

A catalogue of emperors and popes. Each page is divided into two columns: on the left is a history of the popes since the birth of Christ; on the right is a list of emperors from the time of Octavian Augustus onwards. Published by Bethmann (1879) in the *Monumenta Germaniae Historica*. (105)

Cerboni see *Cronica latina*

Cerruti Gerardo (15th c.) [It.]

At the time of the earthquake of 7 May 1473, he was ambassador in Bologna for Francesco Sforza, duke of Milan, to whom he sent a letter in June 1473. In the letter he answered the duke's request for information about the effects of the earthquake. The letter has been published in Gazzini *et al.* (1991). (344)

Charles I of Anjou (1226 – 1285) [Lat.]

He was the son of Louis VIII of France, and was given the counties of Anjou and Maine by his father. He accompanied his brother, Louis IX, on the crusade to Egypt. Later on, pope Urban IV persuaded him, as champion of the Guelf party in Italy, to conquer the Kingdom of Sicily. He was crowned in Rome in 1266, and defeated his enemy Manfredi at Benevento in that same year. Two years later he also defeated Conradin of Swabia. As king of Sicily he played an active and extremely influential role in Mediterranean politics. In 1272 he proclaimed himself king of Albania, and in 1272

he acquired the title of king of Jerusalem, adopting an aggressive attitude towards Constantinople. He lost Sicily as a result of the rebellion known as the *Sicilian Vespers* (1282) and the intervention of king Peter III of Aragon. (127) (131)

Chomatianus Demetrius (died c.1236) [Gr.]

Archbishop of Ohrid (in present-day Macedonia) in 1216/7. He wrote a large number of deeds and letters which are a very important source for the history of the early 13th century. (098)

Chounradus Schirensis (Conrad of Scheyern) (1206 – after 1245) [Lat.]

A monk known to have worked as an amanuensis and miniaturist at the Benedictine abbey of Scheyern, in the diocese of München-Freising (Germany). The most important of his many works are those of a historical nature, such as the *Chronicon Schirense* and the *Annales*, which cover the period 1077-1226. All these have been published by Jaffé in the *Monumenta Germaniae Historica*. (105)

Chronicae Magni presbyteri Continuatio Reicherspergensis (13th c.) [Lat.]

A continuation, for the years 1195-1279, of the chronicle of Magnus (died 1195), priest of Reichersberg (Austria). It was compiled by various canons of the abbey there. From 1222 onwards it is entirely original. (105)

Chronica de civitate Ravennae (first half of the 14th c.) [Lat.]

A short anonymous chronicle of the city of Ravenna from its origins to 1346. The author has not been identified, but presumably lived in the first half of the 14th century, and his work is likely to have been written around the middle of that century. For the history of Ravenna in the early centuries AD, up to the 9th century, the chronicle relies on the *Codex pontificalis ecclesiae Ravennatis*, while for the later period it uses texts which are now lost. The work has survived in a single early 15th century manuscript codex, now in the Biblioteca Estense in Modena (X.P.4.9), which also includes other texts concerning Ravenna Church history. The only published edition is that by Muratori (1725) in the *Rerum Italicarum Scriptores*. (133)

Chronica minora (Armenian) (11th – 15th c.) [Arm.]

These are minor chronographies, generally in chronological order, written as small independent works, as additions to historical narratives (see Arakel of Tabriz), or simply as marginal notes. Hakobyan (1951-1956) gathered into two volumes fifty-two 13th – 18th century minor chronicles, nearly all of which were unpublished.

Vol.I Chronicle 3 (known as *Annals of King Het'um*, 13th c.), from 1076 to 1296; two manuscripts contain various additions up to 1351. Attributed by the editor to Het'um (Hayton). (089) (123)

Chronicle 11 (known as *Anonymous of Sivas*, 16th c.), from 1384 to 1596. (319) (365)

no. 27, *Chronographic notulae*. no.4 records events from 846 to 1338 (023)

Vol.II Chronicle 2 (known as *Chronicle of the historian Het'um*, 13th c.), from the year 1 to 1294 (104) (123)

Chronicle 4 (known as *Annals of the Anonymous of Sivas*, 13th c.), from Adam to 1300. (110) (115) (128) (142)

Chronicle 7 (David of Merdin, 15th c.), from 1450 to 1457 (colophon of a ms. written at Merdin, also containing the chronicle of Samuel of Ani [see below]). (319)

Chronicle 11 (Gregory of Kamakh, 17th c.), from 1018 to 1614, with continuations up to 1670. (134) (184) (319)

Chronicle 15 (Vartan of Baies, 17th c.), from 1291.	< 319 >
Chronicle 24 (anonymous, of uncertain date), 484-1176.	< 089 >
no. 25, chronographic <i>notulae</i> : no.3, from 1258 to 1339.	< 123 >

Chronica minora (Byzantine) (10th – 16th c.) [Gr.]

The name (adopted by their first editor, S.Lambros) given to brief items of scattered information in manuscripts dating from the 10th century, which characteristically tend to maintain a chronographic style, giving exact dates, with indiction number, year, month and day. The title "chronicles" is given to heterogeneous materials embracing both genuine chronicles and small items of information in the margin of manuscripts. The numbering is that of the most recent edition (CFHB XII), to which we have added the chronicle in *Marcianus graecus* 595, published by Mioni (1981). For the brief notes published by Lampros (1910), and the "*chronologische Einzelnotizen*" collected by Schreiner himself (1977, pp.605-23) see colophons and *notulae*.

Edition: Schreiner (1975-1979).

1-13 "*Reichschroniken*", recording events concerning Constantinople:

Chronicle 3 contains a variety of information from 780 to 1066. < 029 > < 032 >

Chronicle 7, from 1204 to 1391, later extended to 1435. For the 14th century it gives a series of important events not recorded by historians. < 203 >

Chronicle 8 ("*Short Chronicle of 1352*"), from 1204 to 1352. < 172 > < 175 > < 179 – 181 >

Chronicle 9, from 1315 to 1422 (with an additional item for 1448). < 167 > < 179 – 181 >

14-22 ("*Kaiserchroniken*", recording events concerning the Byzantine emperors)

Chronicle 20 has scattered information from 1204 to 1261. < 108 >

23-52 (*chronicles concerning regions or towns*)

Chronicle 25, of Cypriot origin, 1191-1231. < 104 >

Chronicle 26, of Cypriot origin, 1209-1310. < 160 >

Chronicle 28 contains a collection of items of information for 1425-1432 (some *notulae* are in French) and another for 1491-1510. < 375 >

Chronicle 30 (*Short Chronicle of Lesbos*) records events in the lives of the Gattilusio family of Genoa from 1355 to 1428. < 225 >

Chronicle 32 (*Chronicle of Argos and Nauplion*, cf. *Chronicon syntomon*, PG 157, cols.1167-83). Composed after 1464 and contains information for 920-1446/7. < 277 >

Chronicle 33 (*Short Chronicle of Morea, 1423*). It has survived in a number of versions. The text (as reconstructed from a heterogeneous manuscript tradition) is that of a local Peloponnesian chronicle with interpolated local information, and continuations up to 1523/4. See also the more recent edition by Loenertz (1984). < 277 > < 279 >

Chronicle 49 (*Short Chronicle of Thessalonica*), records information between 1334 and 1402, mostly concerned with events at Thessalonica. < 254 >

53-80 (*accounts of the Turkish conquests*)

Chronicle 60a contains a variety of information for 1368-1514. < 236 >

Chronicle 69 consists of heterogeneous accounts covering events up to 1570. < 236 >

Chronicle 87 contains reports of five earthquakes between 1343 and 1354. < 179 – 181 > < 183 > < 203 >

Chronicle 91 records brief items of information about the Ottomans from 1355 to 1430. < 252 >

Chronicle 107. Part II records various items of chronological information from 1383 to 1522. < 230 >

Chronicle 113 contains three items of information between 1343
and 1347. < 179 - 181 >
Chronicle in codex *Marcianus graecus* 595 (Venice). < 179 - 181 >

Chronica Regia Coloniensis (late 12th - early 13th c.) [Lat.]
The second part of this chronicle covers the period 1106 to 1144 and derives from the
Annales Patherbrunnenses (744-1144, Paderborn. Edited by Waitz (1880) in the
Monumenta Germaniae Historica. < 089 >

Chronica S. Petri Erfordensis moderna (14th c.) [Lat.]
A chronicle compiled by the monks of the Benedictine monastery of St. Peter at Erfurt
in the diocese of Mainz (Germany). The chronicle was described as *moderna* by
Holder-Egger (1899) because that was how the preceding chronicle from the monastery
(11th and 12th c.) was described in the 14th century. The text covers events from 1072
to 1335. There are three continuations up to 1355 (see below). < 054 > < 130 >

Continuatio II (14th c.) [Lat.]
It narrates events from 1336 to 1353. < 190 >

Continuatio III (14th c.) [Lat.]
It covers the period 1335 to 1355 and derives from *Continuatio I* (1070-1335) and
II, with additional information from other annals. < 190 >

Additamentum (14th c.) [Lat.]
This part was included as a supplement by its editor, Holder-Egger, after
Continuatio III. The text records events in the years 1335, 1341 and 1348, and
has been published in the *Monumenta Germaniae Historica*. < 190 >

Chronicle of the earthquakes of Erznka see Amiras of Erznka

Chronicle of Galaxidi (1703) [Gr.]
A chronicle composed in March 1703 by the hieromonk Euthymius, on the basis of var-
ious documents which bring together a variety of information not only about the town
of Galaxidi in Phocis, but also about various other places in Greece and Dalmatia from
981 to c.1690. The original sources are lost. < 114 >

Chronicon ad annum Christi 1234 (first half of the 13th c.) [Syr.]
An anonymous Syriac chronicle, written in the first half of the 13th century, narrating
events from Adam to 1234 AD (the ending is lost). The author was often an eyewit-
ness of the described events of his lifetime. He most probably lived in Edessa (pres-
ent-day Urfa, in Turkey), because he took part in the conquest of the town by Saladin
in 1187. After the reign of Constantine the Great, the chronicle is divided into two his-
torical sections, one secular and the other ecclesiastical. The ecclesiastical section
breaks off at the year 1207. < 051 > < 067 >

Chronicon breve Atinensis ecclesiae (14th c.) [Lat.]
A brief church chronicle, in two parts, from Atina in Latium (central Italy). The first
part derives from two works by Peter the Deacon, a monk from Montecassino who lived
in the 11th century. The works are the *Acta S. Marci et SS. Nicandri et Marciani* and
the *Inventio et traslatio beati Marci martyris* which Peter the Deacon had disingenu-
ously attributed to Adenulf II, archbishop of Capua (1008 - c.1018) and Bishop Leo of
Atina, who died about 1072. The second part derives from a catalogue of 11th centu-
ry bishops of Atina, which was probably part of a lost work by Peter the Deacon enti-

tled *Destructio et restauratio Atinae urbis*. The author who combined the two parts added brief historical notes for the years 1155, 1202, 1349, 1355 and 1356.

< 192 - 196 >

Chronicon Claustro-neoburgense (1322-1428) [Ger.]

This 15th century chronicle may have been compiled at the town of Klosterneuburg (near Vienna). Its author was a layman about whom we have no information. It records events in the period 1322-1428.

< 190 >

Chronicon Estense (second half of the 14th c.) [Lat.]

An anonymous chronicle compiled in the second half of the 14th century, dealing with Este family matters from 1101 to 1354. It was later continued to 1393. The first part reaches 1260, and derives entirely from the *Annales Sanctae Justinae Patavini* (Padua Italy), with interspersed short, dry items of information about the history of Ferrara, which completely cease at the year 1212. From 1260 to 1354 the chronicle must have been compiled by a single author from Ferrara who was a diplomat or member of the Este household. The continuation is by an anonymous author who may have been an ecclesiastic. It extends from 1355 to 1393, and was started after 1368.

< 162 >

Chronicon Faventinum (12th - 13th c.) [Lat.]

A chronicle of the period 20 BC - 1218 AD compiled from 1189 onwards by Tolosano, a canon of Faenza cathedral. He was struck down with apoplexy in 1219, and died in 1226. For the period 1219-1236, his chronicle was continued by another canon of Faenza. The chronicle was published by Mittarelli (1771) in the continuation of the *Rerum Italicarum Scriptores*, and republished by Rossini (1936-39) in the new edition of the *Rerum Italicarum Scriptores*

< 054 > < 105 >

Chronicon Marchiae Tarvisinae et Lombardiae (second half of the 13th c.) [Lat.]

A chronicle (1207-1270) compiled by a Benedictine monk from the monastery of S.Giustina in Padua (Italy). The author made use of earlier annals of his abbey and a chronicle of the Marca of Treviso, now lost. Published by Soranzo (1914-1916) in the new edition of the *Rerum Italicarum Scriptores*. An earlier edition, entitled *Annales S.Iustinae Patavini*, was published by Jaffé (1866) in the *Monumenta Germaniae Historica*.

< 105 >

Chronicon Montis Sereni (early 13th c.) [Lat.]

A chronicle (1124-1225) from the Augustinian monastery of Lauterberg (or Petersberg) in the diocese of Merseburg (Germany), compiled around 1227-30. Published by Mader (1661), and republished by Ehrenfeuchter (1874) in the *Monumenta Germaniae Historica*.

< 105 >

Chronicon Parmense (second half of the 13th - first half of the 14th c.) [Lat.]

An anonymous chronicle which records events at the city of Parma (Italy) from its earliest origins to 1338. Before 1280, the information it provides is scanty and schematic, but the following part has all the breadth and detail of a diary. The author was probably a notary who lived between 1270 and 1338. For the retrospective part of the chronicle he must have used earlier chronicles, but he had first-hand experience of contemporary events.

< 105 > < 136 > < 145 > < 161 > < 162 >

Chronicon Patavinum see *Liber Regiminum Paduae*

Chronicon Pontificum. Continuatio Avenionensis (late 14th c.) [Lat.]

A papal chronicle in Latin about the life of Gregory XI (1371-1378). It is in fact part

of a broader based chronicle of the period 1334-1494, which was itself a continuation of the lives of the popes by Martin of Troppau (a Dominican chronicler). The *Chronicon Pontificum*, whose material is original for the period from 1370 onwards, was compiled between 1394 and 1398 by an author who was a native of the Toulouse region and had been living at Avignon since 1370. The text was published by Baluze (1679), and republished in a new version by Mollat in 1914 (I, p.416). (213 - 221)

Chronicon quod dicitur Willelmi Godelli (second half of the 12th c.) [Lat.]

This chronicle, which has been wrongly attributed to William Godel, is original for the period from the second half of the 12th century onwards, and was written by an unidentified author associated with the archbishopric of Sens (France). The 18th century edition (1760-1786) in the *Recueil des historiens des Gaules et de la France* is defective, and requires the additional extracts published by Holder-Egger in the *Monumenta Germaniae Historica*. (087) (089)

Chronicon Regiense see Levalossi Sagacino

Chronicon Sublacense (late 14th c.) [Lat.]

This chronicle records events at the Benedictine monastery of Subiaco (central Italy) from 593 AD to 1389, and comes down to us through *codex Vaticanus Rossianus* 385 of the late 14th century, which is probably a copy of a lost codex containing the first draft of a chronicle written by various hands at various times. The chronicle is somewhat fragmentary in nature as a result of the successive sedimentation of different materials brought together in various drafts. It has a number of parts. Initially there is simply a bare list of abbots, with a few schematic items of information added to each name. Then comes the life of John VII, which derives from old 12th century chronicles; and finally there are the lives of abbots Henry and William, deriving from sources written in 1300. Information on the period from 1369 to 1389 was added about 1400.

(081 - 082) (192 - 196)

Chronicon Ullanense (last quarter of the 13th c. - early 15th c.) [Lat.]

An anonymous chronicle which owes its name to the fact that it is preserved at the collegiate church of St. Mary at Ullà (Spain). It is a version of the Barcelona chronicles, which are of non-ecclesiastical origin and were begun in the last quarter of the 13th century and continued up to 1409. Since the report of the earthquake of 1373 belongs to the original part of the chronicle, it was probably composed by a scribe working for the city council or some other lay body in Barcelona, and hence it must have reference to that city rather than to Ullà. Published by De Marca (1688). (213 - 221)

Chronicon Userciense (late 13th c. - late 14th c.) [Lat.]

A Latin chronicle containing brief items of information concerning the period 1276-1373. It was written by various contemporary monks from the abbey at Uzerche (southern France), the last of whom was responsible for the notes relating to 1370 and 1373. Published by De Manteyer (1902). (213 - 221)

Chronik aus Kaiser Sigmund's Zeit bis 1434 (15th c.) [Ger.]

A chronicle begun by an anonymous author from Nuremberg (Germany). It covers the period 1126-1434, with additions up to 1441. (190)

Chronique de Terre Sainte (early 14th c.) [Fr.]

One of three chronicles from the Latin East known as *Les Gestes des Chiprois*, the other two being the *Histoire de la guerre qui fu entre l'empereur Frédéric II et Johan d'Ibelin* by Philippe de Navarre (see below), and the *Chronique du Templier de Tyr* (see below),

attributed to Gérard de Montréal. It covers the period 1132-1224, and takes many of the events it records from the *Estorie de Eracles* (see below) and the *Annales de Terre Sainte* (see above). (097)

Cinnamus John (c.1143 – after 1185) [Gr.]

A Byzantine historian, who was secretary to the emperor Manuel I. He wrote a historical epitome covering events from 1118 to 1176. (084)

Cippico Coriolano (1425-1493) [Lat.]

He belonged to a noble family from Traù in Dalmatia (present-day Trogir, in Croatia), and was responsible for the *Petri Mocenici imperatoris gestarum libri tres*, published in 1477. Its subject is Pietro Mocenigo's expedition to the Levant in 1470-1474. (343)

Cobelli Leone (c.1425 or 1440 – 1500) [It.]

An Italian artist and historiographer. He belonged to a noble Forlì family and was a friend of the Ordellaffi, the artist Melozzo da Forlì, and the Riario family. - On the basis of this information, scholars have calculated that he was born about 1440. Recently, however, it has been suggested that his date of birth should be put back to 1425. He was certainly at Forlì in 1455, and spent much of his life there. In 1488 Cobelli began writing his *Cronache forlivesi dalla fondazione della città sino all'anno 1498*. For the period from the foundation of Forlì to 1461, he made use of already existing local historiography. From 1461 onwards, Cobelli nearly always had personal experience of the events he records. From that point onwards, therefore, his work is original. (369)

Codagnello Giovanni (13th c.) [Lat.]

An Italian notary, who held the post of *cancelliere* to the Piacenza Commune from 1202 to 1230, and compiled some annals which are original from the year 1189 onwards. The information he provides about the preceding period derives from lost sources, particularly old Cremona chronicles. Published by Huillard-Bréholles (1856) as *Chronicon Placentinum*, by Pertz (1863) as *Annales Placentini Guelfi*, in the *Monumenta Germaniae Historica*, and finally by Holder-Egger (1901), as *Annales Placentini*, in the same collection. (105)

Comnena Anna (1083 – c.1153/4) [Gr.]

A Byzantine historian, who was born and died at Constantinople. She was the eldest daughter of the emperor Alexius I Comnenus (1081-1118), and wrote a long historical panegyric of her father, called the *Alexiad*. (044)

Conforto da Costoza (Confortus Pulex) (14th c.) [Lat.]

An Italian chronicler. We do not know for certain whether he was a notary, but in 1316 his name appears in the register of the College of Notaries of Vicenza, and three of his sons took up that profession. Confortus took part in the political life of Vicenza, becoming *sindaco* in 1340, councillor in 1345, and *gastaldo* in 1355. He wrote a chronicle of Vicenza in a simple kind of Latin which is close to the vernacular. These *Frammenti* deal with events at Vicenza between 1371 and 1387, and are mostly in annal form. He is a careful chronicler of local events and at times appears to be well informed about distant occurrences. (190)

Contarini Bertuccio (15th c.) [It.]

From August 1456 to April 1457, he was ambassador of the Republic of Venice in Naples. On 11 December, he sent a despatch to doge Francesco Foscari about the earthquake of 5 December 1456. It has been published by Figliuolo (1989, pp.23-4, doc.VI), using a copy in the State Archives in Milan (*Venezia*, 343). (310 – 318)

Contarini Giovanni (Zuane) (14th-15th c.) [It.]

On 30 August 1402, he wrote a letter in Venetian vernacular to his cousin, Domenico Soranzo, about the earthquake of July 1402 which struck the Gulf of Corinth in central Greece. The text has been published in Thiriet (1959, pp.6-7). (253)

Continuatio anonyma Chronici Veronensis Parisii de Cereta see Parisio da Cerea

Continuatio Pontificum Italica II [Lat.]

A short chronicle which is in fact a continuation, for the years 1276-1285, of the *Chronicon pontificum et imperatoris* of Martin of Troppau (a Dominican chronicler). (132) (133)

Continuation of the Chronography by Elias of Nisibis (975-1049) [Syr.]

This text is a later, brief continuation added to the *Chronography* by Elias of Nisibis (975-1049). It is only a few pages long, and opens with some biographical information about Elias himself. It also contains a brief record of an earthquake in Syria between October 1261 and September 1262. (120)

Cortusi Guglielmo (14th c.) [Lat.]

He worked as a public official at Padua (northern Italy) from 1315 to 1356, and wrote a *Historia de Civitate Padua*, which covers the period from 1237 to 1358. From 1310 onwards he was dealing with events of which he had personal experience. (190)

Cosmas of Prague (1045-1125) [Lat.]

Deacon of the cathedral of Prague, who was born in 1045, and died in 1125. Between 1119 and 1125 he wrote the *Chronica Bohemorum*. For the second half of the 11th century this chronicle derives from lost ancient annals of Prague cathedral. (054)

Critobulus Michael (15th c.) [Gr.]

A writer, lord of the Aegean island of Imbros (Turkey) and copyist. Among his writings is an important historical work (*Historiae*, ed. Reinsch 1983). (302)

Cronaca Bolognetti (15th c.) [It.]

This name is given to a 15th century Bolognese vernacular chronicle, a version of which came to light in the late 19th century in the Spanocchi codex in the Biblioteca Labronica in Livorno. It contained events in the history of Bologna from 423 to 1463. There are two more texts of this chronicle in Bologna. One is the late 15th century codex 583 in Bologna Biblioteca Universitaria, containing events from 423 to 1454, and the other is codex B. 1090 in Biblioteca Comunale dell'Archiginnasio in Bologna, containing events from 892 to 1410. All three codices belonged to the Bolognetti family. Sorbelli (1910-1940) included this work, along with ten other Bolognese vernacular chronicles, in the *Corpus chronicorum bononiensium*, using the Biblioteca Comunale dell'Archiginnasio version with additions from the versions in the other two codices. (248)

Cronaca dei Laurenzi (15th c.) [It.]

A chronicle concerned with Tifernum, now called Città di Castello (Umbria, central Italy). When Ascani (1966) published it, he tentatively attributed the part covering 1323-1408 to Cesare Laurenzi, who lived in the second half of the 15th century, and the later part to Pietro Laurenzi, a notary who was active from 1480 to 1544. Three copies of the *Cronaca* survive: the first dates to the 16th century, while the other two are later and in poorer condition. There are reports of others, but they are now lost. Ascani's edition (1966) follows the earliest manuscript up to 1388; but the editor says that for

the later part he has followed the 18th century copy in the Archivio Capitolare at Città di Castello, with occasional use of the other two texts. (232)

Cronaca Rampona (15th c.) [It.]

The chronicle known as the *Cronaca Rampona*, and called "Chronicle A" in the Sorbelli edition (1906-40) of the *Corpus Chronicorum Bononiensium* for the new *Rerum Italicarum Scriptores*, takes its name from the Ramponi family, who owned the codex. Sorbelli used codices 431 and 607 in Bologna university Library. The chronicle reaches the year 1471. From the year 1104 onwards, it relies on the chronicle attributed to Bartolomeo della Pugliola, a Bolognese friar who in 1397 was vicar of the convent of S. Francesco in Bologna. He died between 1422 and 1425. In a passage under the year 1394, Bartolomeo states that his work is a translation and abbreviation of a Latin chronicle by the Bolognese notary Jacopo Bianchetti (d. 1405), which is now lost. In making this abbreviated version, Bartolomeo added notes which were either original or came from contemporary chroniclers dealing with events from 1395 to 1425.

(303 - 304) (306) (308) (320 - 323) (325 - 332) (336)

Cronaca senese (end of the 15th c.?) [It.]

This Chronicle survives in a single manuscript copy of late 1490, made by Antonio di Martino d'Antonio, a member of an obscure family who were probably artisans and not from Siena (Tuscany). He states that he copied the text from an old book given him by a goldsmith called Paolo di Tommaso. On this basis, the author of the work has been tentatively identified as Paolo di Tommaso di Paolo di Vannuccio, a member of a family of goldsmiths known as dei Montauri, who lived in Siena and for a while in Perugia as well. The identification is much debated, however. The chronicle is for the most part a compilation of earlier chronicles and covers the period from 1170 to 1431. Lisini and Iacometti (1939) have published only two parts, covering 1170-1315 and 1381-1431, because for the period 1316 to 1380 it repeats almost word for word early chronicles which are already well known. (270)

Cronaca senese dall'anno 1202 al 1362 (14th c.) [It.]

An anonymous vernacular chronicle dealing with events in Siena (Tuscany) between 1202 and 1362. The chronicle is defective in that a few leaves are missing from the original codex, so that there is an interruption to the narrative from 1268 to 1281. 13th century events are not always recorded very accurately, but when the narrative approaches the compiler's lifetime, events are more accurate and the whole chronicle is more reliable and detailed. (145)

Cronaca Varignana (15th c.) [It.]

This chronicle called "Chronicle B" in the Sorbelli edition (1906-40) of the *Corpus chronicorum Bononiensium* for the new *Rerum Italicarum Scriptores*, takes its name from Giacomo da Varignana, who was assumed to be the author because his name appears in the title of manuscript 432 in Biblioteca Universitaria in Bologna; but the title is a very late addition and thought by scholars to be unreliable. The work is therefore considered anonymous by the most recent criticism. The chronicle reaches the year 1471, with additions for the years 1486, 1490 and 1497. Amongst the sources used by the *Cronaca Varignana*, particularly extensive use is made of the *Chronicon Estense*. (248) (291) (303 - 304) (306) (308) (320 - 323) (325 - 332) (336)

Cronica gestorum in partibus Lombardie et reliquis Italiae

(end of the 15th c.) [Lat.]

This anonymous Italian chronicle is mostly, but not exclusively, concerned with the history of the city of Parma in the period 1476-1482. About the author we can only make

conjectures. Muratori, who was the first to publish this text, maintained that it might have been written by a citizen of Parma called Caviceo (1443-1511), but its simple and low-key style and a lack of reliable evidence led the second editor, Bonazzi (1904), to reject that identification. Bonazzi in his turn suggested that the chronicle was rather a compilation of local information perhaps collected together by someone close to the Torelli family, who owned the manuscript, though it was later acquired by the Biblioteca Palatina in Parma. The chronicle has survived in a single manuscript codex, which is probably autograph. (352 - 354) (356) (358) (359 - 364)

Cronica latina (1369-1483) [Lat.]

A chronicle concerned with the Umbrian town of Tifernum (now Città di Castello, central Italy) in the period 1369-1483. It is preserved in a 17th century manuscript copy and was reproduced in Magherini Graziani's *Storia di Città di Castello*, published in 1890. When Ascani (1966) published it, he noted that the Cerboni family is frequently mentioned, and went on to suggest that the part up to 1432 was the work of Angelo Cerboni, a local notary who held various posts in public service. Other members of the family, Ascani thought, then continued it. (232) (320 - 323)

Cronicon Siculum (second half of the 14th c.) [Lat.]

This anonymous chronicle was probably written by an ecclesiastic who lived in Naples. It seems to have been compiled in the years 1364-1373 and continued later for the years up to 1396. Apart from brief and irregular references to earlier periods, it is arranged chronologically and is primarily concerned with events in the mainland Kingdom of Sicily, barely touching on Sicily itself, from which it in fact became separated after the *Sicilian Vespers* (1282). (224) (227)

Cronicon Suessanum (second half of the 14th c.) [Lat.]

An anonymous chronicle written in the second half of the 14th century. It records events in the civil and ecclesiastical history of Sessa Aurunca (near Caserta, southern Italy) between 1103 and 1348. (117) (146)

Cusani Francesco (15th c.) [It.]

He belonged to the entourage of Francesco Sforza, duke of Milan, and was sent to the Kingdom of Naples to convey the duke's condolences after the earthquake of 5 December 1456. He left Milan on 13 January 1457, reaching Naples on 4 February, where he waited for king Alfonso of Aragon to return from a visit to Apulia region. In a letter of 11 February 1457 to duke Francesco Sforza, he tells of damage in the city of Naples and of a strong aftershock which struck Capua. The letter is preserved in the Archivio di Stato in Milan, and has been published in Senatore (1997, no.189, pp.490-2). (310 - 318)

Cydones Demetrius (c.1324 - c.1398) [Gr.]

A Byzantine scholar, theologian and politician, who was born at Thessalonike and died in Crete. His correspondence has been published by Loenertz (1956-60). (225)

al-Dhahabi, Shams al-Din Muhammad Ibn Ahmad (c.1274-1348) [Arab.]

A famous Syriac historian and theologian, who was born at Damascus or Mayyafarikun and died at Damascus. His historical and traditionist works were popular, and he is different from other historians in that he gives the names of the authorities he quotes. His greatest historical work covers events of the period from the beginning of Islam (622 AD) up to the year 700 of the Hegira (1300-1301). (137)

Da Marano Giacomo (1344-1412) [It.]

He was probably born in Ferrara, and died in that city. Nothing of significance is

known about his life. In the early 15th century, he wrote a chronicle in Italian of the history of Ferrara from its origins up to 1412, the year in which he died. Three manuscript copies of his work are in the Biblioteca Comunale Ariostea in Ferrara, the earliest dating to the 16th century (Cl.I, no.534, cart.4°). Part of the work (covering the years 1298-1412) was published between 1929 and 1931, but it is not reliable.

< 187 - 188 > < 264 - 265 > < 267 >

D'Angeluccio Francesco (active 1460) [It.]

He continued the L'Aquila (Italy) chronicle tradition (which had come to a halt in 1436 with Nicolò di Borbona's work), beginning his own chronicle about 1460 and recounting events at L'Aquila from 1436 to 1485. He is mentioned in the *Capitolazioni* of the city of L'Aquila presented to king Ferdinand of Aragona in 1458; and we also learn from his work that in 1466 he was one of those elected by the Commune in connection with a water concession to the Dominican fathers. The text of the chronicle, sometimes called the *Historia Aquilana*, has come down to us in an autograph manuscript copy.

< 310 - 318 > < 325 - 332 >

Da Ripalta Antonio (late 14th c. - 1463) and **Alberto** (1436-1485) [Lat.]

Antonio da Ripalta came of a noble Piacenza (Italy) family, and was responsible for compiling the *Annales Placentini*, which cover the years 1401-1463. He took an active part in the political life of the city. His son Alberto, after studying at Ferrara, Bologna and Turin, became a famous jurisconsult, and continued the annals from 1465 to 1484. They are of great importance for the history of Piacenza, because the two authors are narrating contemporary events. The chronicle is preserved in a single manuscript codex.

< 298 > < 344 >

David of Merdin (Davit' Merdinc'i) see *Chronica minora* (Armenian)

Decembrio Pier Candido (1399-1477) [It.]

An Italian humanist, who was born at Pavia. In 1419 he was in the service of duke Filippo Maria Visconti, and he remained there, carrying a number of diplomatic missions in Italy, Germany and France, until the duke's death in 1447. Between 1450 and 1455 he moved to Rome, where he was appointed *magister brevium* by pope Nicholas V — a post which he continued to hold under Calixtus III. Between 1456 and 1459 he moved to Naples, where he became secretary to king Alfonso and king Ferdinand of Aragon. Here he came into contact with some of the most famous humanists of the day, including Lorenzo Valla and Giannozzo Manetti. It was during this period that he wrote a letter from Naples (14 January 1457) to Cicco Simonetta about the earthquake of 5 December 1456 (published in *Senatore* 1997, no.184, pp.477-9).

< 310 - 318 >

De Grazia Francesco (14th) [Lat.]

An Italian prior of the monastery of S.Salvatore dei Veneziani (Venice) from November 1359 onwards. He wrote a *Chronicon monasteri Sancti Salvatoris Venetianarum* which covers the period 1141-1380.

< 190 >

Delayto Giacomo (14th - 15th c.) [Lat.]

An Italian notary from Rovigo, who lived in Ferrara, becoming chancellor to duke Nicola d'Este in 1390. His *Chronica nova illustris et magnifici domini Nicolai Marchionis Estensis*, edited by Muratori as *Annales Estenses*, set out the history of the Este family from 1393 to 1409, including events in nearby cities as well as in Ferrara.

< 248 > < 253 > < 262 >

Del Carretto Ottone (15th c.) [It.]

At the time of the earthquake of 5 December 1456, he was the Milanese ambassador in Rome. In a letter of 31 January 1457 to duke Francesco Sforza he mentions the aftershocks which continued to be felt in the Kingdom of Naples. The letter is preserved in the Archivio di Stato in Milan, and there is a partial transcription in Figliuolo (1988-89, I, p.173).
(310 - 318)

Della Gazata Pietro see Levalossi Sagacino

Della Morte Giacomo (Notargiacomo) (died after 1524) [It.]

A Neapolitan notary, who is thought to have been responsible for a chronicle of the city of Naples from ancient Roman times up to June 1511, known as the *Cronica di Napoli di Notar Giacomo*. In a passage about the year 1500, he refers to himself as "I, James the notary", which suggests that he may be Giacomo della Morte, a notary who was active in Naples at that time.
(310 - 318) (336)

Dell'Aquila Matteo (c.1410-1475) [Lat.]

An Italian theologian and natural philosopher, who belonged to the Celestine congregation of the Benedictine order. Around 1430 he went to the university of Bologna to study theology. In 1450 he was made abbot of the monastery of S.Spirito at Morrone, near Sulmona (central Italy), and abbot general of the Celestines, a post which he held for 25 years. From 1465 he taught at the university of Naples. He was also a member of the Accademia Alfonsina (which later became the Accademia Pontaniana). The earthquake of 5 December 1456 and the appearance of two comets, in May 1456 (Halley's comet) and July 1457, led him to write a *Tractatus de cometa atque terrae-motu* in the summer of 1457. There is a very corrupt copy of the text in codex 268 of the *Barberini Latini* manuscripts in the Biblioteca Apostolica Vaticana (edited by Figliuolo 1990).
(310 - 318)

Dello Mastro Paolo (15th c.) [It.]

A citizen of Rome. He wrote a diary recording events concerning the city in the period 1422-1488.
(310 - 318) (325 - 332)

De Ritiis Alessandro (1434 - after 1497) [Lat.]

An Italian Franciscan, who wrote two chronicles as well as a number of theological, pastoral and liturgical works. In 1456 he was at Capestrano (Italy), but succeeded in escaping an earthquake there because he had gone to Chieti. At the same period, he visited the archive of S.Giovanni at Capestrano, from which he obtained a good deal of material for his chronicles. Shortly afterwards, he settled at L'Aquila, where he held important positions within his order. From 1493 to 1497 he wrote his chronicles: the *Chronica Civitatis Aquilae* and the *Chronica Ordinis Minorum*. The first is a Latin continuation of Buccio di Ranallo's *Cronaca*, with occasional passages in the vernacular. It can be divided into three parts: the first consists principally of a synoptic chronology; the second deals with events at L'Aquila from its foundation to 1362, and is based on Buccio di Ranallo's work; the third part is original, and continues the narrative from 1363 to 1495.
(310 - 318) (325 - 332)

De Rotis Nicolino (14th c.) [Lat.]

He was born at Santhià (Vercelli, northern Italy) and lived at Vercelli, where he worked as a notary. He wrote a *Diario* containing information about local events. The period 1330-1420 is the most detailed.
(212)

Dietrich von Schachten (15th c.) [Ger.]

A German traveller. In 1491 he accompanied prince William the Elder of Hesse to Jerusalem. He was at Nicosia (Cyprus) at the time of the 1491 earthquake. < 375 >

Discorso storico con molti accidenti occorsi in Orvieto (14th c.) [It.]

An Italian chronicle which records events at Orvieto (central Italy) from 1342 to 1369. The anonymous compiler proves to be well informed about the state of the city. He was a native of Orvieto and probably a *cancelliere* of the *Riformagioni*, as may be judged from the accurate information in the text about communal matters. According to the editor (Fiumi 1902), the author may have been Antonio di Orvieto, a 1350 diarist.

< 192 - 196 >

Dominici Luca (1363/64 - 1410) [It.]

A notary, politician and writer from Pistoia (Tuscany). He worked as a notary from 1391 to 1410, and from 1397 onwards was actively involved in public life at Pistoia, filling a number of different posts. He wrote two chronicles which are largely in diary form. The first of these, entitled *Cronaca della venuta dei Bianchi e della moria*, has survived in a copy made by his brother Paolo, and covers the period from May 1399 to August 1400. It begins by relating the miracle which inspired the great religious movement of *Bianchi* processions — so called because the adherents wore white habits — which spread rapidly across Italy and the rest of Europe. The second chronicle survives in an autograph manuscript (defective at the beginning and end) which records events from 4 August 1401 to 14 September 1402. The author describes the political situation in Italy, paying particular attention to Tuscany and the struggles and discord between families in Pistoia.

< 248 >

Dusany Pere (15th c.) [Cat.]

A Catalan ambassador. At the time of the earthquake of 5 December 1456 he was in Naples for the Catalan *Generalitat*, the financial committee of the Catalan *Cortes*, to which he sent a letter about it, dated 12 December 1456. It was published by Duran i Sampere and Sanabre (1930, no. LXXVI, p. 228).

< 310 - 318 >

Ebo of Michelsberg (died 1163) [Lat.]

A monk at the Benedictine abbey of Michelsberg, near Bamberg (Germany). Shortly after the mid-12th century, he wrote a life of Bishop Otto of Bamberg (*Vita Ottonis episcopi Babenbergensis*). It first appeared in abridged form in 1719, and was then published first by Köpke (1856) in the *Monumenta Germaniae Historica*, and later by Wikarjak and Liman (1969) in the new series of the *Monumenta Poloniae Historica*.

< 054 >

Eckehard of Aura (c. 1050 - after 1125) [Lat.]

A German Benedictine monk, who was born around 1050 and died after 1125. Around 1101 he made a pilgrimage to the Holy Land. He was abbot of the monastery of Aura (in the diocese of Würzburg, Germany) from 1108. He wrote a universal chronicle (1-1125), in five books, original from 1099 onwards.

< 054 >

Emo (1175-1237) [Lat.]

A German monk who joined the Premonstratensian order in 1209. In 1213, he and his fellow monks moved to a monastery at a place called *Floridus Hortus* (Bloembhof, near Groningen, Holland). In 1225 he was appointed abbot there by bishop Theodoric, and held this position until his death on 13 December 1237. He wrote a large number of theological works as well as a *Chronicon* covering the period 1204-1234. This work was continued up to the year 1273 by Menko, who succeeded him at the abbey. < 105 >

Epistolae viginti sex ad Ludovicum Francorum Regem, huius nominis septem, cognomine iuniorem (the 1160s) [Lat.]

A collection of letters written in the 1160s to king Louis VII of France (1137-1180) by various eminent persons in the Latin Kingdom of Jerusalem, urging him to intervene on behalf of the Christian community in the Holy Land. (085)

Ercole d'Este (1431-1505) [It.]

Marquis of Este and duke of Ferrara, Modena and Reggio from 1471. The Este court reached the height of its splendour in his day, acting as host during his rule to famous personalities such as Ludovico Ariosto. When the earthquake of 5 December 1456 struck, Ercole was at Foggia at the court of the king of Naples. He was deeply affected by the earthquake, and wrote a letter about it to his brother Borso on 7 December. Copies of this letter have been published in the corpus of the *Rerum Italicarum Scriptores*, first of all in the *Historia Miscella*, edited by Muratori (vol.18, col.722) and then in the *Corpus chronicorum bononiensium*, edited by Sorbelli (1927, vol.18/1, pp.248-9); and there is another edition in De Blasiis (1888, pp.356-7). A new edition has been published by Figliuolo (1989, pp.13-4, doc.II), using a copy in the Bibliothèque Nationale de France (ms. ital. 1587, fol.151r.). (310 - 318)

(L') Estoire de Eracles Empereur et la Conquete de la Terre d'Outremer [Fr.]

The modern name given by the editor of the *Recueil des Historiens des Croisades* to a text which includes a French translation of William of Tyre. The work was subsequently continued by a series of different hands working at different times, thereby creating a tradition of texts, some of which bring the narrative as far forward as 1277.

(097) (123)

Faccipecora Antonello (15th c.) [It.]

He was Gonzaga agent in Naples at the time of the earthquake of 15 January 1466. On 26 January 1466, he wrote a letter to Ludovico III Gonzaga, marquis of Mantua, published in Figliuolo and Marturano (1996); the original is in the Archivio di Stato in Mantua (*Gonzaga*, b.805, Napoli, fol.172). (336)

Falcando Ugo (active in the years 1154-1169) [Lat.]

A reliable source for the history of medieval Sicily. Falcando was an official (perhaps a notary) in the *Curia regis* of the Norman kings of Sicily under William I (1154-1166) and William II (1166-1189). His principal work, the *Liber de regno Siciliae*, is a detailed account of the life and workings of the Norman court and the capital of the Kingdom at Palermo. (087)

Fantaguzzi Giuliano (1453 - after 1521) [It.]

An Italian patrician, native of Cesena (Italy), who spent his entire life in his native town, occupying various positions in local government. He supported the conservative party in its opposition to the granting of power to the populace, as initiated by the popes who governed the city after the *signoria* of Novello Malatesta. Two works of his survive. His *Caos* contains annotations and copies of passages from his own personal reading, as well as transcriptions of local histories with added notes about contemporary events. His *Occhurentie et nove notate* records events in the town of Cesena, from 1460 to 1521, of which he himself had personal experience. Since the two works have survived in a single codex, they are often referred to collectively as *Caos*. (369)

Fecini Tommaso (1441 - after 1479) [It.]

He was born in Siena (Tuscany). In 1472 he became *camerlengo* of salt, and later entered the banking profession. He wrote a *Cronaca senese* covering the history of the

city from its origins to 1479. The manuscript is incomplete and ends at that year. The part which deals with the years 1431-1479 was published by Lisini and Iacometti (1939) in the new edition of the *Rerum Italicarum Scriptores*. (320 – 323)

Ferrante of Aragon (1431-1494) [It.]

King of Naples in 1458, when he succeeded to the throne as the natural son of Alfonso of Aragon. His ascent to the throne was opposed by the pope of the time, Calixtus III. On 13 August 1490 he wrote a letter to his daughter Eleonora, duchess of Ferrara, concerning an earthquake in Constantinople. (372)

Fiocchi Girolamo (1347 or 1348 – after 1433) [Lat.]

A Dominican friar, who was born at Forlì (Italy), who was both a preacher and a master of theology. He was vicar of the convent of S.Domenico at Bologna and provincial defensor. His surviving works are sermons and treatises in Latin as well as the *Chronicon Foroliviense*, which recounts the story of Forlì from 1397 to 1433. It is an original work, dealing with events of which he had for the most part first-hand knowledge. The *Chronicon* survives in a manuscript copy of the second half of the 16th century. (291)

Francesco di Giacomo (15th c.) [Lat.]

A Perugia (Italy) notary. He wrote a memoir about the effects of the 3 February 1477 earthquake at Perugia and Foligno. The memoir has been published in Abbondanza (1973, p.307, no.246); the original is now in a collection of notarial deeds in the Archivio di Stato at Perugia. (346 – 348)

Fritsche Closener (c.1315 – between 1390 and 1396) [Ger.]

An ecclesiastic from Strasbourg (France). He was a priest and custodian of the altar of St. Mary in Strasbourg cathedral. Around 1362 he wrote a chronicle containing information about events at Strasbourg. He had personal knowledge of the events narrated for the period 1320-1360. (190)

Fulk of Chartres (1058-1127) [Lat.]

An ecclesiastic and historian, who was born at Chartres (France). He became a canon at the church of Notre-Dame in his native city. He took part in the first crusade with the troops of duke Robert of Normandy and his own lord, count Stephen of Chartres and Blois. Once in the Holy Land he joined Baldwin, brother of Godfrey of Bouillon, and became his chaplain. After the election of Baldwin as king of Jerusalem, he moved to the Holy City and remained there until his death in 1127. It was at Jerusalem, around 1106, that he wrote his *Historia Iherosolymitana*. He subsequently expanded it and continued to update it until his death. It was published in the third volume of the *Recueil des Historiens des Croisades* (1866) and republished by Hagenmeyer (1913). (043) (046) (050) (051) (052) (057)

Galaktion Madarakis [Gr.]

A citizen of Constantinople. He wrote various *notulae* about the earthquakes of October-November 1343. Nothing is known of his life. (179 – 181)

Geoffrey of Donjon (12th-13th c.) [Lat.]

The eleventh Grand Master of the military order of St. John (1192-93/ – 1202). In June 1202 he wrote a letter to king Sancho VII of Navarre which provides detailed information about the earthquake of 20 May 1202. (097)

Giacomo di Marco (1440 – after 1471) [It.]

A citizen of Bologna (Italy) who worked as a barber. Nothing else is known of his life.

His brief chronicle of the city of Bologna, covering the period 1445-1471, has not yet been published. The autograph manuscript is in the Biblioteca Comunale dell'Archiginnasio in Bologna (Codex B.1648). (306) (308)

Giovanni da Bazzano (c.1280s - 1363/64) [Lat.]

He was a native of Bazzano, who became a notary in Modena (Italy). He was very active in business and did not work as a notary on a regular basis. During the years 1306-1336 he held posts in the chancery and therefore had access to the Commune, as well as to the accounts and records offices. His *Chronicon Mutinense* is a Latin chronicle which records the civil history of Modena between 1002 and 1363. He was in contact with Bonifazio da Morano, another chronicler from Modena.

(173) (187 - 188) (192 - 196) (200 - 201)

Giovanni da Parma (died after 1382) [Lat.]

A canon from Parma (Italy), who is mentioned in 14th century codices from the city of Trento. He wrote a chronicle in which he provides brief items of information, mostly about Trento, covering the period 25 January 1348 to 30 August 1377. (190)

Giovanni di mastro Pedrino (c.1390-95 - after 1465) [It.]

Giovanni Merlini, better known as Giovanni di mastro Pedrino, was born in Forlì (Italy) at some time between 1390 and 1395. Like his father, he worked as a painter and decorator, and he was also involved in the political life of his city. His only known work is a detailed chronicle of Forlì. The only surviving part is that concerning the years 1411-1464, with some Latin fragments for a few years in the 14th century. The autograph text is in the Biblioteca Apostolica Vaticana (codex *Vaticanus Latinus* 10490), and was published by Borghezio and Vattasso in 1929 and 1934. (310 - 318)

Giovanni Merlini see Giovanni di mastro Pedrino

Giovanni di Pordenone (1308-1350) [Lat.]

An Italian writer, son of a notary called Odorico of Pordenone (1263-1335). He wrote a *Supplemento* to his father's *Memoriale*, which records matters of public and family history up to the year 1350. Its nature is such that it could be described as a family record, but the part published by Bianchi (1844) is limited to items of a public character. There is a 19th century copy of the whole manuscript in the Biblioteca Comunale at Udine. (190)

Giovanni presbyter (15th c.) [It.]

An Italian ecclesiastic. He wrote a *Cronaca di Bologna*, published by Ricci (1885). The text of the chronicle comes from a codex fragment preserved amongst the manuscripts of Biblioteca Universitaria in Bologna (LXXXI). It consists of ten leaves which can be assumed to be autograph, in view of the gaps and corrections involved. It is a small fragment and hence covers a brief period of history. The first item of information it contains dates to December 1406 and the last to May 1408, the year in which Bologna played an active role in connection with the meeting between pope Gregory VII and the antipope Benedict. (262)

Girbert de Boi (12th-13th c.) [Lat.]

According to Röhricht (1893) he was a French soldier. In 1213 he wrote a letter to Amadeus (archbishop of Constantinople from 1197 to 1220), about a destructive earthquake in the region of Isauria (now in south-eastern Turkey). The letter has been published in Röhricht (1893, no.868, pp.233-4). (102)

Giustinian Pietro (15th c.) [Lat.]

He is the author of the Latin chronicle *Venetiarum Historia*, from the origins of Venice until 1358, the year in which it was probably terminated. This important chronicle is known through the King's codex 148 of the British Museum, copy of 1564: this codex is described in Foligno (1905) and in the edition of the chronicle by Cessi and Bennato (1964). Carile (1967) drew attention to a more ancient codex, probably the autographic one, the Paris Lat. 5877. Very little is known about Piero, the son of the more famous Giustinian: in 1373 was the Mayor (*podestà*) of Conegliano. < 136 >

Glycas Michael (d. c.1204) [Gr.]

A Byzantine historian, often confused with Michael Sicydites of Corfu. He was secretary at the imperial court in 1159, and wrote theological works as well as a chronicle of the world in four parts, up to the death of Alexius I Comnenus (1118). < 039 >

Gonzalez de Clavijo Ruy (d. 1412) [Sp.]

A Castilian aristocrat, who was born in Madrid in the 14th century, and became chamberlain at the court of king Henry III of Castile and Leon. He was placed in charge of an embassy to the court of Tamerlane in Samarkand (Uzbekistan) which left Cadiz (Spain) on 21 May 1403. He kept a diary during the long journey to and from Samarkand, and once he was back in his own country in 1406, he wrote a detailed narrative of his extraordinary experience. < 225 >

Goro di Giovanni (15th c.) [It.]

A Florentine citizen. At the time of the earthquake of 5 December 1456 he was in Naples. His brief account of the earthquake has been published by Figliuolo (1989, pp.15-6, doc.III), using a copy preserved in a 16th century manuscript in the Biblioteca Nazionale in Florence (II.III.77, fol.302). < 310 - 318 >

Goswin (d. 1393) [Lat.]

A Benedictine German monk in 1349. He was prior of the Marienberg monastery (Germany) and court chaplain to duke Leopold III from 1374 onwards. What little we know of his life comes from his only work, *Chronik des Stiftes Marienberg*: a chronicle of events at Marienberg from 1100 to 1393. He died in that year or shortly afterwards. < 190 >

Gregoras Nicephorus (c.1290/1 - between 1358 and 1361) [Gr.]

A Byzantine scholar and historian (b. Heraclea Pontica, d. Constantinople). He wrote various hagiographical, rhetorical and theological works, and was also versed in the sciences. His most important work, however, is the *Rhomaïke historia* in 37 books. It deals with the period 1204-1359, and is particularly important for the first half of the 14th century events. < 149 - 150 > < 158 - 159 > < 175 > < 179 - 181 > < 183 > < 203 >

Gregory of Kamakh (Grigor Kamaxec'i), see *Chronica minora* (Armenian)

Gregory the Priest (12th c.) [Arm.]

He wrote a continuation of Matthew of Edessa's chronicle (see below), covering the period 1136-1162. < 076-080 >

Grillo Michelangelo (15th c.) [Lat.]

An Italian notary to the Commune of Foligno (Umbria). He wrote a memoir about the Foligno seismic sequence of January-February 1477. The document was inserted among the Foligno town council *Riformanze*, and is now in the Foligno section of the Archivio di Stato at Perugia (*Priorale, Consigli e riformanze*, reg.38, fol.56). < 346 - 348 >

Guarna Romualdo see Romuald of Salerno

Guerriero da Gubbio (early 15th c. – 1481) [It.]

An Italian notary at Gubbio (Umbria) from 1425 onwards, he became chancellor of the Commune in 1456. He was also a soldier, orator and ambassador. From 1461 onwards, he remained more or less uninterruptedly at Gubbio, where he held various judicial and political posts. He wrote a *Cronaca* of events in the town from 1350 to 1472, which survives in three manuscripts, two of which are autograph, while the third dates to the second half of the 16th century. For events before his time, Guerriero used earlier Gubbio chronicles and other sources; and he made notes about contemporary events as they happened. He subjected the first version of the *Cronaca* to a reworking; and the 16th century manuscript contains in its turn a reworking of the first two versions.

(232) (320 – 323) (325 – 332)

Gui Bernard (1261-1331) [Lat.]

He joined the Dominican Order in 1279, was a famous inquisitor of the Roman Church between 1307 and 1323, and became bishop of Lodève in Hérault (France) in 1324. He was a very prolific writer. One of his works is the *Flores Chronicorum, seu catalogus pontificum Romanorum*, which continues the *Liber Pontificalis* (see below) up to 1331.

(152 – 153)

Guido de Spiapasto (13th c.) [Lat.]

A *procuratore* for the Commune of Vicenza (Italy). He wrote a chronicle of Rome from 1288 (the year in which Nicholas IV was elected pope) to 16 October 1301. The author was especially concerned to note the pope's departures from Rome, his residence in other cities and his returns to Rome, as well as the opening and closing of papal audiences.

(152 – 153)

Guido Pisano (late 11th – first half of the 12th c.) [Lat.]

He may perhaps be identified as the Italian deacon Guido, who took part in the conquest of the Balearic Islands by the Pisans in the years 1113-1115 and who is mentioned in many Pisan documents in the years 1113-1118. In 1118, he wrote a work entitled *Liber de variis historiis*. In codex *Vaticanus Latinus* 11564, fol.184, in the Biblioteca Apostolica Vaticana (a 1459 copy which very probably derives from the 12th century original) there is a long and detailed description of the effects of the earthquakes in January 1117.

(054) (055)

Guillaume Caoursin (1430-1501) [Lat.]

He was born at Douai (France) and became vice-chancellor of the Order of Knights Hospitallers of St. John at Rhodes in 1462. This meant that he had to deal with a succession of dramatic events in 1480 and 1481: the unsuccessful siege of the island of Rhodes by the Turks in 1480 and the long sequence of earthquakes in 1481. He devoted two works specifically to these earthquakes. The first is exclusively concerned with the seismic events of that year, and is entitled *De terremotus labe qua Rhodii affecti sunt*; the second is a speech entitled *Oratio in Senatu Rhodiorum de morte magni Thurci* which he made before the Senate of Rhodes on 31 May 1481, on the occasion of the death of Mehmed II. These writings were published in 1496 in a collection also containing other works of his.

(356) (359 – 364)

Hebrew chronicle of Girona (1427) [Hebr.]

A chronicle, in letter form, by an anonymous Jew living in Girona (Spain). It was very probably written in June 1427, since the last entry refers to the 18th of that month. The author was an expert in astronomy and well acquainted with the earthquake the-

ories of some ancient Greek and rabbinical writers. The original manuscript is in the Bayerische Staatsbibliothek in Munich (manuscript 307). A critical edition of this text was published by Del Valle (1996). It included a Spanish translation, the Hebrew text, and a reproduction of the original manuscript. < 282 - 286 >

Heinrich der Taube von Selbach (died after 9 October 1364) [Lat.]
A German monk from Selbach in the diocese of Cologne (Germany). He was a canon at Eichstatt, and compiled a *Chronica*, which covers the period 1294 to 1364. < 190 > < 192 - 196 >

Heinrich des Frommen von Sachsen (15th c.) [Ger.]
A German traveller, who visited Cos in 1498. < 376 >

Ibn 'Abd al-Zahir, Muhyi al-Din Ibn 'Abd al-Zahir (1233-1293) [Arab.]
An Egyptian historian, who was born and died at Cairo. He was secretary to the Mamluk sultans Baybars and Qalawun, and wrote their biographies. < 139 - 141 >

Ibn Abi Zar', Abu'l-'Abbas Ahmad al-Fasi (d. 1310/1320) [Arab.]
An Arab historian (from Fes), who wrote a chronicle of Morocco. < 008 > < 036 >

Ibn al-'Adim, Abu'l-Qasim 'Umar Kamal al-Din (1192-1262) [Arab.]
An Arab historian (who was born at Aleppo, and died at Cairo). He wrote a voluminous work containing the biographies of famous men of Aleppo. < 067 > < 076 - 080 >

Ibn al-Athir, 'Izz al-Din Abu al-Hasan 'Ali (1160-1233) [Arab.]
A famous Arab writer. He was a native of Mosul and studied at Baghdad. Little information about his life has come down to us, but we know that he took part in Saladin's war against the Crusaders. He was a prolific writer himself, and also made summaries of other authors' works. His *al-Kamil fi 'l-ta'rikk* is a compilation of historical facts from the beginning of the world up to 628 of the Hegira (1230-1231). < 012 > < 028 > < 037 > < 041 > < 042 > < 066 > < 067 > < 076 - 080 > < 089 > < 097 >

Ibn Bahadur, Muhammad b. Muhammad al-Mu'mini al-Shafi'i (Abu al-Fadl Kamal al-Din) (1432-1473) [Arab.]
A Shafi'ite historian, who was born at Tripoli in Libya. He studied in Egypt and remained there for the rest of his life. His unpublished work *Futuh al-nasr fi ta'rikk muluk Misr* is preserved in the National Library in Cairo. < 160 >

Ibn al-Banna', Abu 'Ali al-Hasan b. Ahmad b. 'Abd Allah al-Baghdadi (c.1005-1079) [Arab.]
A prolific Arab writer, who worked in many fields, including history, theology, philosophy and medicine. He belonged to the Hanbalite school of Baghdad. His chronicle, known as *al-Ta'rikk*, contributes a great deal to our understanding of the religious and social life of Baghdad in his time. < 033 - 034 >

Ibn al-Dawadari, Abu Bakr Ibn 'Abdallah ben Aybak (14th c.) [Arab.]
A famous Egyptian historian, who was brought up in Syria. Two works of his have survived: *Durrat al-Tijan* (begun in 1309 and completed in 1331) is a substantial universal chronicle, whereas *Kanz al-durar* is simply an abridgment of that chronicle. < 119 >

Ibn Duqmaq, Sarim al-Din Ibrahim b. Muhammad b. Aydamur al-'Ala'i al-Misri (c.1349-1406) [Arab.]
An Egyptian historian and prolific writer. That he was a Hanafite is apparent from

his writings. His manuscript book in twelve volumes entitled *Nuzhat al-anam*, traces the history of Egypt up to 779 of the Hegira (1377-1378). It had great influence on later Arab historians. (118) (119)

Ibn al-Furat, Nasir al-Din Muhammad b. 'Abd al-rahim b. 'Ali al-Misri al-Hanafi (1334-1405) [Arab.]

An Egyptian historian; his work *Ta'rikkh al-duwal wa 'l-muluk* is so rich in quotations from other authors that it is considered to constitute evidence of numerous lost works. His history spans the period from the early 6th century of the Hegira (1107-1203 AD) to his own time. (144)

Ibn Habib, Badr al-Din Abu Muhammad al-Hasan ben 'Umar al-Dimashqi al-Halabi al-Shafi'i (1310-1377) [Arab.]

A Syrian historian, who was born at Damascus. He began his education there and subsequently pursued it at Aleppo. He held a senior post at the Chancery there, and was honoured during his lifetime for his literary talents. Many of his books are written in rhymed prose. His *Tadhkirat al-nabih* is a history of the Mamluk sultan Kalawun. (178)

Ibn Hajar, Shihab al-Din Ahmad Ibn Hajar (1372-1449) [Arab.]

A judge and historian, who lived in Egypt. He was not only a prolific writer on canon law, but also left important prosopographical works. (222) (226) (228) (249) (255 - 256) (257) (263) (273) (274) (275) (280) (281) (290) (292)

Ibn al-'Imad, 'Abd al-Hayy b. Ahmad (1622-1679) [Arab.]

A famous professor of Syrian origin, who belonged to the Hanbali school. Around 1670 he finished writing a large biographical history entitled *Shadharat al-dhahab*, which covers the period from the first year of the Hegira (622 AD) to the year 1000 of the Hegira (1591/1592 AD). (211)

Ibn Iyas, Abu al-Barakat Muhammad ben Ahmad Zayn al-Din al-Nasiri al-Dimashqi al-Hanafi (1448-1524) [Arab.]

An Egyptian historian, who lived at the time of the decline and fall of the Mamluks in Egypt and the opening years of Ottoman domination. The principal works attributed to him are: a popular history of the patriarchs and prophets, *Marj al-zuhur fi waqa'i' al-duhur*, a cosmography particularly concerned with Egypt, *Nashq al-azhar fi 'aja'ib al-aqtar*; and finally his most important work, *Bada'i al-zuhur fi waqa'i' al-durur*, a history of Egypt up to the Mamluk period, followed by a brief year-by-year summary of events. A certain lack of homogeneity in its various sections suggests that Ibn Iyas may not have been responsible for the whole work.

(281) (324) (337) (345) (356) (368) (375) (383)

Ibn al-Jawzi, 'Abd al-Rahman b. 'Ali Ibn al-Jawzi (1116-1200) [Arab.]

A jurist and historian (who was born and died in Baghdad); he was one of the most famous scholars of the Hanbalite school of theology and law. He was a very prolific writer and taught at the university in his native city. Only a few volumes of his *History* of the Ayyubid and Buyid periods have survived.

(012) (028) (051) (076 - 080)

Ibn Jubayr (second half of the 12th c.) [Arab.]

A Spanish traveller of noble family. He was born in Andalusia (Spain), received a scientific and literary education, and was appointed secretary to the governor of Granada. On 3 February 1183, he set off on a pilgrimage to Mecca, returning to Granada on 25

April 1185. He wrote an account of his journey, which took him first to Alexandria, then up the Nile, and across the Red Sea to Mecca and subsequently Medina. On his return journey he was at Baghdad and Damascus, and then sailed from Acre. In December 1184 he was in Sicily, visiting Messina and Palermo in particular. He reached Andalusia after more than two years' absence. (087)

Ibn Kathir, 'Imad al-Din Isma'il ben 'Umar (c.1300-1373) [Arab.]

A famous Arab historian, who came from Syria. He studied at Damascus, where he later held legal positions in the Mamluk administration. His *al-Bidaya wa 'l-nihaya* is a history of Islam based on the works of other Arab historians, such as al-Dhahabi, Ibn Qadi Shuhba etc. (028) (101) (144) (182)

Ibn al-Labbad, see 'Abd al-Latif

Ibn al-Qalanisi, Abu Ya'la Hamza b. Asad al-Tamimi (died 1160) [Arab.]

A Syrian historian, who wrote a continuation of a *Chronicle* of Damascus, which is very frequently referred to in later sources. He personally experienced the Damascus earthquakes and described them with great accuracy up to the year of his death.

(041) (042) (051) (066) (067) (074 - 075) (076 - 080)

Ibn Rushd, Abu'l-Walid Muhammad b. Ahmad Ibn Rushd (or Averroes) (1126-1198) [Arab.]

A very important Arab philosopher, who was born and died at Cordoba in Spain. Many of his works are lost, but amongst those which have survived are his commentaries on Aristotle's *Poetics* and *Rhetoric*. (090)

Ibn Shakir, Abu 'Abdallah Muhammad al-Darani Ibn Shakir al-Kutubi

(1287-1363) [Arab.]

A Syrian historian who was born and died at Damascus. Very little information about him is known, because he never held any official post, but he wrote an important universal history and a prosopographic treatise. (012)

Ibn al-Shihna, Muhammad b. Muhammad (died 1412) [Arab.]

A Syrian historian and judge, who was born and died at Aleppo. He had a brilliant career as a judge at Aleppo, Damascus and Cairo, with an intervening period when he was in disgrace. The anonymous and untitled text in Ms. Ar. 1536 in the Bibliothèque Nationale de France has proved to be part of a book by Ibn al-Shuhna entitled *Rawd al-manazir fi 'ilm al-awa'il wa-l-awakhir*. The title *Minah al-rabbaniyya* and the reference to the writer 'Abd al-Rahman Ibn Khaldun, which appear in the manuscript in a notice on the preliminary page, are apparently the work of a forger (see Sauvan and Balty-Guesdon 1995). (178) (255 - 256)

Ibn Taghribirdi, Abu al-Mahasin Gamal al-Din Yusuf (c.1409-1470) [Arab.]

An Egyptian historian, who was born and died in Cairo. He came of a Mamluk family and obtained a senior position in the army. He became learned in religious and rational fields as well as in music. He also knew the Persian and Turkish languages. His *Nujum al-zahira* is a history of Egypt from 641 of the Hegira (1243-1244 AD) to his own time, and was intended as a continuation of the work of al-Maqrizi (see below).

(001) (024) (160) (307) (324) (337)

Ibn Tulun, Shams al-Din M. b. 'Ali b. A. al-Salihi al-Dimashqi al-Hanafi

(1475-1546) [Arab.]

A Syrian polygraph whose historical studies are particularly concerned with the city of

Damascus and its surroundings. Among his works are a chronicle of events in Egypt and Syria from 1479 to 1520 (*Mufakahat al-khillan fi hawadith al-zaman*) and a history of the citadel of Damascus (*al-Sham'a al-mudi'a fi akhbar al-qal'a al-dimashqiyya*), as well as many other historical and biographical works. < 356 > < 375 >

Ibn al-Wardi, Zayn al-Din Abu Hafs 'Umar ben Muzaffar b. 'Umar ...

Muhammad 'Ali (c.1290-1349) [Arab.]

A keen follower of Shafi'ism, he was a textual scholar, man of letters, historian and poet. He was educated in Syria, at Damascus, Aleppo and Hamah. He began his career in the magistracy before devoting himself entirely to literary activities. His *Tatimmat mukhtasar fi akhbar al-bashar* is simply an abridgement of Abu 'l-Fida's chronicle. < 097 > < 182 >

Ibn Wasil, Abu 'Abdallah Jamal al-Din Muhammad ben Salim ben Nasr Allah ben Salim (1208-1298) [Arab.]

A Syrian historian and man of letters, who also worked as a judge. He was born at Hamah, and began his studies there, continuing them at Jerusalem. After carrying out many missions, he settled at Hamah in 1264 and remained there for the rest of his life. < 097 >

Ignatius of Smolensk (second half of the 14th – early 15th c.) [Rus.]

He is thought (though not unanimously) to have been the author of a *Journey to Constantinople* (1389-92), a *Description of Thessalonica and the Holy Mountain* (Mt.Athos) and parts of an *Abbreviated Chronicle* up to 1404 (for its relationship with other chronographical sources, see Majeska 1984, p.68). Compared with other Russian travellers and pilgrims, he stands out for his interest in "secular" details such as the landscape and natural disasters. < 234 > < 236 > < 238 – 242 > < 244 – 246 >

Ignotus civis Barensis (first half of the 12th c.) [Lat.]

An anonymous Italian chronicler (perhaps of Bari, southern Italy), who died about the middle of the 12th century, and was the author a *Chronicon* spanning the years 855-1149. The work was published by Pellegrino (1643) and republished by Muratori (1724) in the *Rerum Italicarum Scriptores*. < 038 >

Infessura Stefano (c.1435 – c.1500) [Lat.-It.]

An Italian humanist of the anti-papal faction. He was born in Rome, studied law, and worked as a judge for a short period; then he taught Roman law at the university of Rome. He was for a long time secretary to the Roman senate. He is well known as the author of a *Diario della città di Roma*, written partly in Latin and partly in Italian. The *Diario* is a chronicle of Rome from 1294 to 1494, and adopts a highly polemical attitude towards the papacy. It was first published in 1723 (ed. J.C.Eckhardt), and republished, with omissions, by Muratori (1734) in the *Rerum Italicarum Scriptores*. A critical edition by Tommasini (1890) was published in the *Fonti per la Storia d'Italia*. < 310 – 318 >

al-Jawhari, 'Ali b. Da'ud al-Jawhari (15th-16th c.) [Arab.]

An Egyptian writer, who was active around 1495 and whose works include a history of Egypt, *Nuzhat al-nufus wa 'l-abdan fi tawarikh al-zaman*, and a history of Egypt and Syria, *Inba' al-hasr fi abna' al-asr*. < 226 > < 228 > < 281 > < 292 > < 297 >

al-Jazari, Shams al-Din Abu 'Abdallah Muhammad b. Ibrahim b. 'Abd al-'Aziz, al-Dimashqi (1260-1338) [Arab.]

A famous Syrian historian, who was born at Damascus and died at Wasit. His best

known work, *al-Ta'rikkh al-musamma bi-hawadith al-zaman wa-anba'ih wa-wafayat al-akabir wa-l-a'yan min abna'ih*, is known by the abbreviated title *Ta'rikkh al-Jazari* and is often quoted in al-Dhahabi's *Ta'rikkh al-Islam*. He was apparently responsible for the manuscript Arabic text no. 6739 in the Bibliothèque Nationale de France, which is a history of Egypt and Syria from the year 689 of the Hegira (1289-1290 AD) to 699 H. (1299-1300 AD). The work is apparently a continuation of Sibṭ Ibn al-Jawzi's *Mir'at al-zaman* by Shams al-Din al-Jazari (see Blochet 1925). < 144 > < 154 - 155 >

Johanns von Winterthur (c.1302 - after 1348) [Lat.]

A friar minor, whose *Chronica* narrates 14th century events in northern Switzerland and at Constance. Published by Baethgen and Brun (1927) in the *Monumenta Germaniae Historica*. < 190 >

John VI Cantacuzenus see Cantacuzenus

John Malakis (14th c.) [Gr.]

He wrote a brief *notula* about the October 1343 earthquakes at Constantinople. < 179 - 181 >

Jordanus of Sévérac (Jordanus Catalanus) (died 1336) [Lat.]

He was born at Sévérac (probably in the Rouergue region) in France, and became a friar in the Order of Preachers. In 1330 he became bishop of Colombo in India. His work entitled *Mirabilia descripta* is an account of his travels in the Far East. It was first published in 1839 (ed. Coquebert-Montbret) and republished in 1925 (ed. Cordier). < 169 >

Kalendarium Zwettlense (14th - 15th c.) [Lat.]

Annals from the monastery of Zwettl, in the diocese of Passau (Austria), compiled by various hands at various times. They record events from 1243 to 1458. < 190 >

Konrad von Megenberg (c.1309-1374) [Ger.]

A German canon, who was also a theologian and scholar. He taught as a *magister* at the university of Paris from 1334 to 1342. During the period 1342-1348 he was headmaster of the School of St. Stephen in Vienna. In 1348-50 he began writing the first systematic compendium in German of the known natural world (*Buch der Natur*, 1348-50). From 1348 to 1374 he lived at Regensburg, where he died. < 190 >

Kyriakos of Ganjak (c.1200/3 - 1272/3) [Arm.]

An Armenian monk, who was born at Ganjak (present-day Ganzak) and educated at the Nor Getik monastery. In 1236 he was taken into captivity by Mongols. After his liberation, he returned to Nor Getik where, by 1240, he had compiled the first part of his chronicle (which he subsequently continued up to 1266). He later moved to Sis, where he probably spent the rest of his life. < 068 >

Landucci Luca (1437-1516) [It.]

A Florentine spice merchant by trade. His fame derives from his *Diario* which spans the years from 1450 up to 1516, the year in which he died. It was continued by an unknown person up to 1542. The work was published by Del Badia in 1883; this text is an important source for the history of Florence in the second half of the 15th century and the first half of the 16th. < 352 - 354 >

Landulf "the Younger" (c.1077 - after 1137) [Lat.]

He is called "the Younger" in order to distinguish him from another Milan chronicler of

the same name, who lived about half a century earlier. He came from a family of humble social status. In 1136, he began writing the *Historia Mediolanensis*, a work which deals with the principal events at Milan in the years 1095-1137. First published by Muratori in the *Rerum Italicarum Scriptores*, and republished by Castiglioni (1934) in the same corpus. (054)

Laurenzi see *Cronaca dei Laurenzi*

Leggendario del monastero di S. Chiara (14th -16th c.) [Lat.]

This manuscript contains information about St. Chiara monastery (at Modena, Italy) written by the nuns themselves within the space of three centuries and certain events thought to be worth recording. It is preserved at Modena, Archivio di Stato, *Manoscritti della Biblioteca*, 162, fol.42v. (190) (248)

Leonardo da Vinci (1452-1519) [It.]

A famous painter and inventor. He was born at Vinci (in the present-day province of Florence). In 1482 he moved to the court of Ludovico il Moro in Milan, but left the city in 1499 when it was taken by the French. From 1500 to 1506 he was back in Florence, and from 1506 to 1513, he was again in Milan. In 1517 he moved permanently to France. In the *Codex Leicester* (formerly *Codex Hammer*), there is a description of an earthquake and a tsunami in the Gulf of Antalya (off the southern coast of Turkey). (359 - 364)

Letter concerning the Jewish community at Chalcis in Greece

(early 14th c.) [Hebr.]

This is a long anonymous letter in Hebrew, sent to Rome (c.1300). It deals with the affairs of the Jewish community at Chalcis. The text contains a brief reference to an earthquake at Corinth (central Greece). The manuscript is in the Jewish National and University Library in Jerusalem (Ms. Heb. 4° 616) and is from the Collegio Rabbinico in Livorno (Ms. no.2). (156)

Letters and reports concerning the earthquake of 5 December 1456 [It.-Lat.]

Amongst letters and reports about the southern Italian earthquake of 5 December 1456, five are of unidentified authorship.

The first in chronological order was a letter written from Foggia on 12 December 1456 to Marquis Ludovico III Gonzaga, by the Mantuan ambassador (identity unknown). The second letter was written in Rome on 18 December 1456 and sent to an unknown correspondent. Both were first published in Figliuolo (1989, doc.VII, pp.25-7, doc.VIII, p.28), using copies in the Bibliothèque Nationale de France (ms. lat. 16021, fols.13v.-14v., 14v.-15r.). The third is a report attached to the letter of 22 December 1456 sent from Naples by the Milanese ambassador Antonio da Trezzo (see above) to duke Francesco Sforza, published in *Senatore* (1997, no.179, pp.167-9). The fourth is a report written probably in January 1457 and sent to an unknown correspondent. It was published in De Blasiis (1885, pp.358-9). The fifth report, very probably dates to January 1457, was sent from the Kingdom of Naples to cardinal Prospero Colonna. It was published by De Blasiis (1885, pp.353-6) and re-edited by Figliuolo (1989, pp.31-3, doc.X), using a copy in the Biblioteca Statale in Cremona (ms. 105, fols.37v.-38r.).

(310 - 318)

Levalossi Sagacino (1272-1357) and **Pietro della Gazata** (1335-1414) [Lat.]

Sagacino Levalossi was a notary at Reggio Emilia (Italy), who wrote a chronicle of events at that city, covering the years 1303-1353. Pietro della Gazata was a nephew of Sagacino. He reworked what his uncle had written, and added an account of the

years 800-1303 and 1353-1388. He was a Benedictine monk at S. Prospero in Reggio Emilia, and in 1355 was sent away to the monastery of S. Giorgio Maggiore in Venice, where he remained until 1363. When he returned to Reggio in 1363, he became abbot of S. Prospero and later *subcollector apostolicus* for Lombardy. In 1391 he became vicar general of the diocese of Reggio Emilia. The chronicle compiled by Sagacino Levalossi and Pietro della Gazata is known as the *Chronicon Regiense* — the title given to it by Muratori in his 18th century edition of the work.

< 187 – 188 > < 190 > < 200 – 201 > < 225 >

Liber Pontificalis (6th-12th c.) [Lat.]

This text is a collection of accounts of the popes in Rome, from St. Peter to Honorius II (1124-1130). The accounts vary in nature and value, ranging from a simple record of the name, place of origin and length of reign of some popes, to substantial biographical information about others, such as Hadrian I (772-795) and Leo III (795-816). It has never been regarded as an official document of papal historiography, but is one of the most important sources for the study of the early Middle Ages. It was published by Duchesne (Paris 1886-1955) in 3 vols.

< 040 >

Liber Regiminum Paduae (13th – 14th c.) [Lat.]

Annals of the city of Padua (Italy) from 1174 up to 1399. For the period 1174-1267 they derive from early Paduan annals, now lost. From 1268 onwards they were compiled by various contemporary authors. They are also known as the *Chronicon Patavinum*, that being the title Muratori (1741) gave the work in the edition published in the *Antiquitates Italicae Medii Aevi*, based on a Ferrarese codex which is now lost. The text of Muratori's edition differs somewhat from that published by Bonardi (1905) in the new edition of the *Rerum Italicarum Scriptores*.

< 105 > < 190 >

Liber XXIV Historiae ecclesiasticae Ptolomaei Lucensis (14th c.) [Lat.]

This work was published by Muratori (1727) in the *Rerum Italicarum Scriptores* as the last book of the *Historia Ecclesiastica* by Tolomeo da Lucca (Bartolomeo Fiadoni, 1236-1327, see below), but is in fact a work of unknown authorship. In the Milanese version, *Liber XXIV* is divided into 43 chapters and records events in the period between 1281 and 1342, whereas in the Padua codex the book is divided up through the lives of popes Boniface VIII, Benedict XI and Clement V, and brings the narrative up to 1313.

< 160 >

Lisiard of Tours (active in the third quarter of the 12th c.) [Lat.]

A French cleric from Tours, who was dean at Laon from 1153 to 1168. The editor of the third volume of the *Recueil des Historiens des Croisades* considers him to be the author of the *Secunda Historiae Iherosolimitanae Pars*, which is traditionally considered to be a sort of epitome of the work of Fulk of Chartres (see above), covering events from 1100 to 1124. However, the attribution of the *Secunda pars* to Lisiard of Tours is not definite.

< 046 > < 052 > < 057 >

Lupus Protospata (second half of the 11th c.) [Lat.]

Protospata was the name that the Byzantines gave to the dignitaries and the generals who held an important political role. The chronicle of Lupus covers the years 855-1102. In compiling the first part he used a source by an anonymous author from Bari (southern Italy), whereas he makes use of his own personal experience for the second half of the 11th century. The work survives in various manuscripts, the earliest of which date to the 15th century, see Mottola (1980).

< 038 >

Macrembolites Alexius (died after 1349 or 1353) [Gr.]

A Byzantine writer and polemicist. Amongst his writings is a lament for the collapse of the church of St. Sophia in Constantinople.

< 179 – 181 >

al-Makin ben al-'Amid, Ibn Abi al-Yasir Ibn Abu al-Makarim Ibn Abi al-Tayyib (c.1205-1273) [Arab.]

An Egyptian historian, who was born in Cairo, where he served the State in a military capacity. When he lost his post, he settled at Damascus, and lived there for the rest of his life. His *Kitab al-majumi al-mubarak* is based on the works of al-Tabari and other historians, and in its turn became a source for other writers such as al-Maqrizi. (048)

Malatèsta da Crema (15th c.) [It.]

He was Gonzaga ambassador in Naples at the time of the earthquake of 15 January 1466. On 23 January 1466, he wrote a letter to Barbara Gonzaga, marchioness of Mantua, part of which has been published in Figliuolo and Marturano (1996); the original is in the Archivio di Stato at Mantua (*Gonzaga*, b.805, Napoli, fol.167). (336)

Malombra Filippo (15th c.) [It.]

At the time of the earthquakes of November 1461, he was ambassador in Naples for Francesco Sforza, duke of Milan, to whom he sent a letter from Penne (central Italy) on 15 December 1461. The letter describes the effects of the earthquakes of 27 November 1461 in the city of L'Aquila and the surrounding area. The letter has been published by Storti (1998, no.231, pp.393-5). (325 - 332)

Manetti Giannozzo (1396-1459) [Lat.-It.]

A famous Florentine humanist and politician. He was Cosimo de' Medici's ambassador in many Italian cities. As a result of clashes with the Medici, he moved from Florence to Naples, where he became counsellor of Alfonso of Aragon. He personally experienced the earthquake of 5 December 1456, and wrote three letters about it on 8 December (in Italian). The one addressed to the Florentine *Signoria* was published by Perosa (1960, I, pp.55-7) and republished by Figliuolo (1989, pp.17-9, doc.IV), using a copy in the Biblioteca Comunale in Siena (J.VI.25, fols.102v-104r.). That addressed to his brother Filippo was published by Figliuolo (1989, pp.20-2, doc.V), and the third, addressed to Vespasiano da Bisticci, was published in Cagni (1969, pp.135-6). In 1457, he wrote a Latin treatise in three books entitled *De Terraemotu* — the earliest earthquake catalogue to have come down to us in its entirety. We still lack a critical edition of the Latin original of this work. Eight codices are known: four are in the Biblioteca Apostolica Vaticana (*Palatini Latini*, 1076, 1077, 1604, fols.97r-143v., *Urbinati Latini*, 5, fols.161r-215v.), and the other four are: in the Biblioteca Nazionale in Naples (XIII.H.79), in the Bibliothèque Nationale de France (*Lat.* 17173, fols.172-218), at San Lorenzo del Escorial (g.III.23), and in the Kraus Library in New York (Catalogue 155, no.9, 1980). (A somewhat perfunctory Italian translation, without critical notes, was made by Scopelliti and published by ENEA in 1983). (310 - 318)

al-Maqrizi, Taky al-Din Abu al-'Abbas Ahmad b. 'Ali b. 'Abd al-Qadi (1364-1442) [Arab.]

A famous Egyptian historian, who enjoyed the privilege of being taught by the best specialists. He held administrative positions as teacher, judge and inspector, before devoting himself to his career as a historian. He was a Shaf'ite. His *Kitab al-suluk fi ma'rifat duwal al-muluk* is a history of the Ayyubids and Mamluks. Quatremère 1937-45 has translated part of this work under the title *Histoire des sultans Mamlouks de l'Egypte*. (094) (101) (118) (119) (121) (144) (160) (182) (189) (199) (226) (228) (255 - 256) (263) (273) (275) (290) (292) (297)

Maragone Bernardo (1108/10 - 1188/90) [Lat.]

A Pisan politician, who compiled the *Annales Pisani* for the period between 1182 and

1190. They were written in his own hand up to the year 1190, and continued by his son up to 1192. < 087 > < 089 >

Marchionne di Coppo Stefani (1336 - c.1385) [It.]

A Florentine chronicler. He took an active part in Florentine public life. In the period 1378-1382 he was a member of councils of the Florentine republic, an official in the land tax office, *capitano* in Volterra and a prior. He also took part in embassies to Milan, Bologna and Germany. He wrote the *Cronaca Fiorentina* which records events in Florence from ancient times up to 1385 — probably the year in which he died. The *Cronaca Fiorentina* can be divided into three parts. For the period from the city's origins up to 1300, the author based his work on previous Florentine chronicles, especially Giovanni Villani (see below). From 1300 to 1348, earlier chronicle material begins to go hand in hand with his own direct experience of events; and from 1348 onwards, he provides first-hand information. < 185 - 186 >

Marchisio Scriba (late 12th - early 13th c.) [Lat.]

A Genoese notary, who replaced Ogerio Pane as official annalist of the Republic of Genoa from 1220 onwards. His contribution to the *Annales Ianuenses* is confined to the period 1220-1224. < 104 > < 105 >

Mascaro Jacme (14th c.) [Prov.]

A Frenchman (probably from Béziers, southern France); he wrote a chronicle, *Libre de Memorias*, in Provençal. It covers the period 1336-1390, and is a completely original work. Published by Barbier (1890). < 213 - 221 >

Mathias von Neuenburg (Matthias de Nuwenburg) (14th c.) [Lat.]

An ecclesiastic chronicler. In 1327 he was at Basle, and in 1329 he became a cleric in the service of Berthold of Bucheck, archbishop of Strasbourg. His *Chronica* records the activities of popes and emperors from 1245 to 1350, with a continuation for 1380. He also wrote the *Gesta Bertholdi episcopi Argentinensis*, which covers the period 1304-1365. < 190 >

Matthew of Edessa (Matt'eos Urhayec'i) (12th c.) [Arm.]

An Armenian historian, who lived at Edessa (his dates are not known) and was an eyewitness of events in the crusader principality of Edessa at the beginning of the 12th century. He wrote a *Chronicle* about affairs in the East from 952 to 1132 which was subsequently continued up to 1162 by Gregory the Priest (see above). < 002 > < 014 > < 023 > < 041 > < 051 >

Maurolico Francesco (1494-1575) [Lat.]

A Sicilian mathematician, astronomer and architect who was born and died at Messina. In 1521 he was ordained as a priest, and subsequently became a Benedictine abbot. He translated into Latin some of the works of the most important Greek mathematicians, including Euclid and Apollonius. He studied ways of measuring the Earth, made astronomical observations, such as that of the supernova which appeared in the constellation of Cassiopeia in 1572 and is now known as Tycho's Supernova. His interests were not only scientific but also historical: he wrote an important history of Sicily entitled *Sicanarum rerum compendium* (1562). < 377 >

Menologium Copto-Arabicum (14th c.) [Arab.]

A religious calendar in Arabic, fragments of which survive in manuscript *Barberinus. Araicus. 2*, in the Biblioteca Apostolica Vaticana. Edited by Nau (1913) in the *Patrologia Orientalis*. < 048 >

Merlini Giovanni, see *Giovanni di mastro Pedrino*

Miari Clemente (c.1360 – after 1412) [Lat.-It.]

An Italian canon at Belluno cathedral in 1380. Between 1382 and 1385 he probably studied canon law at Padua university, shortly after which he was made a priest. He wrote a *Cronaca bellunese* covering the period 1383-1412. The work is in diary form, and deals with the principal events at Belluno, with notes about the events of his own life. In 1873, G.De Donà published an Italian translation of the chronicle, and since then the Latin manuscript has been lost. This Italian translation was reprinted in 1976 and 1999, and is thus all that remains of Miari's chronicle. (231)

Michael the Syrian (1126-1199) [Syr.]

A Syrian historian, who was born at Melitene (modern Malatya, Turkey). He was patriarch of the Jacobites from 1166 onwards, and wrote a universal history from the creation to 1195, in 21 books. It was translated into Arabic and Armenian. The Armenian translation, which is of only slightly later date, contains certain details which add to the surviving Syriac text. The original work was arranged in three parallel columns, which dealt respectively with Church history, secular history and reports of prodigious events such as eclipses, earthquakes, famine etc. (005) (007) (022) (023) (041) (045) (047) (051) (058) (060) (062) (064) (065) (067) (069) (070) (071) (072) (089)

Michele da Piazza (14th c.) [Lat.]

A Sicilian Franciscan friar, who lived in Catania. He wrote a *Historia sicula*, in which he narrates events — even minor ones — in Sicily from 1337 to 1361, but he ignores Italian or European events which had repercussions in Sicily. He was a man of mediocre culture whose written Latin is full of barbarisms and often obscure. He never identifies his sources, whether written or oral, but we know that he was in a position to make use of the private Aragonese archives, for his chronicle even gives the text of some documents. From 1349 onwards, he seems to be his own chief source, and from 1358 the chronicle is recording contemporary events. (198)

Milioli Alberto (c.1220 – after 1273) [Lat.]

It is known that from 1265 to 1273 he was in charge of the public scribe's office in the Commune of Reggio Emilia (Italy), on whose behalf he made an "elegant" transcription of the four books of Statutes. He was in contact with Salimbene de Adam (see below), who lived in Reggio from 1281 onwards. Two works in Latin are attributed to him: the *Liber de temporibus et aetatibus* and the *Cronica Imperatorum*. The first is also known as the *Memoriale Potestatum Regiensium*, a title given to it in volume VIII of the *Rerum italicarum scriptores* (1726) by Muratori, who only published the second part. (113) (132) (133)

Monaci Lorenzo (c.1351-1428) [Lat.]

A notary, who was born in Venice around 1351. He went on some diplomatic missions for the Republic of Venice, especially to the king of Hungary and the French court. In 1388 he was elected chancellor of Crete, where he remained until his death. Between 1421 and 1428 he compiled a *Chronicon de rebus Venetis*. He is considered by critics to be a major figure in Venetian historiography. His chronicle was published in Venice by Corner in 1758. (160)

Montauri see *Cronaca senese*

Morosini Antonio (c.1365-1434) [It.-Ven.]

A Venetian historian, brother of doge Michele Morosini (1382). His close observation

of political life in the Venetian Republic was put into writing in a chronicle which goes up to 1433. The work is one of the most outstanding documents in Venetian historiography. The autograph manuscript of his work is in the Österreichisches Nationalbibliothek in Vienna (cods. 6586-6587). There is an 1888 copy in the Biblioteca Marciana in Venice (Ital., cl.VII, 2048-2049). Extracts from Morosini's chronicle concerning the history of France were edited and published by Derez and Lefevre-Pontalis in 1898-1902. A partial edition, up to the year 1354, with an English translation, has been edited and published by Ghezzi *et al.* (1999). A complete printed edition of the chronicle (1094-1433), was edited by Nanetti (2000).

< 271 > < 272 > < 278 > < 279 > < 287 >

Mufaddal b. Abi'l-Fada'il (14th c.) [Arab.]

A Coptic historian, about whose life very little is known. His sole work, *al-Nahj al-Sadid*, written in 1358, is a history of the Bahri Mamluks from 1260 to 1340, and includes some necrologies which he presents in the form of annals, with particular emphasis on the political history of Egypt and Syria.

< 160 > < 163 > < 166 >

Mussi Giovanni (mid-14th – early 15th c.) [Lat.]

An Italian chronicler from Piacenza. His *Chronicon Placentinum* deals with events in Piacenza and Lombardy in general from 222 to 1402.

< 190 >

Mxit'ar Gosh (Mxit'. Gosh) (c.1130-1213) [Arm.]

A man of letters and monk from eastern Armenia, who lived in various parts of the country. Around 1188 he was in the monastery of Getik (Goshavank'), which he founded himself. The monastery collapsed in an earthquake shortly afterwards, and a few years later he rebuilt it. He also wrote a brief *Albanian Chronicle*.

< 068 >

Mxit'ar of 'Ayrivank' (Mxit'ar Ayrivanec'i) (born c.1267/70) [Arm.]

An Armenian historian (who was born at Yerevan). He wrote a universal history in three parts, from the creation to 1289.

< 005 > < 115 > < 123 > < 128 >

Nadi Gaspare (1418-1504) [It.]

A master mason from Bologna, who wrote a diary beginning with his birth, but becoming more substantial from 1460 onwards. Since his life coincided largely with the *signoria* of Giovanni II Bentivoglio in Bologna (1462-1507), the diary deals at length with matters concerning Giovanni II. Nadi worked on the principal buildings required by Giovanni II, such as the family *palazzo*, which was subsequently demolished by pope Julius II (1507). The Diary (written in vernacular Italian) is preserved in a manuscript in the author's hand.

< 308 >

Necrologio di S.Maria in Trastevere (late 11th c.) [Lat.]

This text was written in the monastery of S.Maria in Trastevere (Rome), very probably at the end of the 11th century, and there are 15th and 16th century additions. Apart from necrological notes, it contains the acts of councils, such as that of Aix-la-Chapelle (816), and letters added at a later date. The earliest item which can be dated with certainty is that concerning the 1091 earthquake. The necrology was published by Egidi (1908).

< 040 >

Neophytus Enkleistus (1134 – after 1214) [Gr.]

A Cypriot hagiographer, who was born at Leukara, and died at Paphos. He wrote a menology which is preserved in manuscript *Parisinus graecus* 1189, in the Bibliothèque Nationale de France.

< 083 > < 089 >

Nicephorus Gregoras see Gregoras

Nicetas Choniates (between 1155/1157 – 1217) [Gr.]

A Byzantine historian (who was born at Chonai in Phrygia, and died at Nicea), whose *Historia* is the chief source for the period 1118-1206. The tone of the work is typical of its time, and it gives a certain emphasis to prodigies and disasters. < 096 >

Nicola della Tuccia (1400 – c.1473-74) [It.]

He was born at Viterbo (Latium). From what he says of himself, he seems to have been a merchant. Between 1452 and 1467 he was five times prior of his home town. He wrote a *Cronaca di Viterbo* in two books: the first of which records events at Viterbo up to 1476; but the last items were added by a different hand. The second book records events in Italy and elsewhere from 1414 to 1468. It appears that where he is narrating events earlier than those of which he had personal experience, he made use of the Viterbo chronicle tradition. His work has been published by Ciampi (1872).

< 192 – 196 > < 310 – 318 >

Nicolò da Ferrara (early 14th c. – shortly after 1387) [It.]

He may have been a native of Ferrara, and after entering the Benedictine order he became a master of sacred theology and abbot of the monastery of S. Bartolomeo, near Ferrara. He worked on his *Polyhistoria* in the second half of the 14th century and dedicated it to Marquis Niccolò II. His work in four books is original and covers the period from the creation to 1383. Muratori (1738) published part of it (1287-1367), but with a mistaken attribution to Bartolomeo da Ferrara (1368-1448), a Dominican friar (Andreolli *et al.* 1991, p.183).

< 190 >

Nicolò Speciale (c.1270 – c.1340) [Lat.]

A Sicilian historian, native of Noto, who lived in Messina. He was a learned man, and in 1334 was a member of an embassy sent by Frederic II of Aragon to the new pope, Benedict XII. It was probably in the closing years of his life that he wrote a history of Sicily, *Historia Sicula*, which narrates events in Sicily from 1282 to 1337. His work often quotes the Latin classics, but in compiling it he does not appear to have used archive documents, and he never identifies his sources, whether written or oral. Only in the case of the eruption of Mt. Etna in 1329, of which he was an eye-witness, does he explicitly state that he is using personal reminiscences.

< 174 >

Nezami of Ganja (1141-1209) [Pers.]

The most important epic poet in Persian literature. He was born and died at Ganja (a town in present-day Azerbaijan). Little is known of his life. He was orphaned at an early age and spent the whole of his life at Ganja. Only a limited number of his *qasidas* (odes) and *ghazals* (love poems) survive. His fame is based on his great *Khamsa* (Quintet), a group of five poems written in *masnavi* form (rhyming couplets) and totalling 30,000 couplets. The final poem in the group is the *Iskandarnama* (Book of Alexander), a philosophical portrait of Alexander the Great.

< 068 >

Notae Halesbrunnenses (1117, 1133, 1338) [Lat.]

Notes written in a manuscript from the Cistercian abbey of Heilsbronn, in the diocese of Eichstätt (Germany).

< 054 >

Notae Sanctae Mariae Mediolanenses (12th – 13th c.) [Lat.]

Contemporary notes (931-1253) written in a liturgical calendar from Milan cathedral. Published by Muratori (1726) in the *Rerum Italicarum Scriptores*, and republished by Jaffé (1863) in the *Monumenta Germaniae Historica*.

< 054 >

Notae Sancti Georgii Mediolanenses (late 13th c.) [Lat.]

Notes (1061-1295) in a liturgical calendar from the church of S.Giorgio in Milan. Published in part by Muratori (1735) in the *Rerum Italicarum Scriptores*, and republished by Jaffé (1863) in the *Monumenta Germaniae Historica*. (054) (105)

Notae Veronenses (14th c.) [Lat.]

Notes written by an unidentified inhabitant of Verona, covering the period 1328-1359. Published by Cipolla (1890). (190)

Notulae see Armenian and Byzantine colophons and *notulae*

al-Nuwayri, Shihab al-Din Ahamd b. 'Abd al-Wahhab al-Bakri al-Kindi al-Shaff'i (1279-1332) [Arab.]

An Egyptian encyclopaedist. He was not only a historian but also a senior official under the Mamluks, and was known for his skill as a calligrapher and bookbinder. He was famous for his encyclopaedic work entitled *Nihayat al-arab fi funun al-adab*. (144) (160)

Oliverus Scholasticus (died 1227) [Lat.]

His narrative of events in the 5th Crusade (1217-1221) is brought together in various works, of which the most substantial is the *Historia Damiatina* (ed. Eccard 1723). (104)

Otto of Freising (1111/1114 – 1158) [Lat.]

A German bishop and historian, nephew of the emperor Henry IV. After studying at the university of Paris, he joined the Cistercian Order, and was appointed bishop of Freising in 1138. In 1147 he accompanied Conrad III on his unsuccessful crusade to the Holy Land. In 1158, he returned to France, where he died. The first of his two main works is a universal chronicle in eight books, probably written in Germany between 1145 and 1146. It reaches the year 1146 and is entitled *Chronica sive historia de duabus civitatibus* (an echo of St. Augustine's *De Civitate Dei*) inspired by a strong historiographic pessimism. His second historical work, entitled *Gesta Friderici*, reaches the year 1156, but is unfinished. (054)

Pachymeres George (1242 – c.1310) (Pachym.) [Gr.]

A Byzantine historian (who was born at Nicea, and died in Constantinople?); he wrote a history of the reigns of Michael VIII and Andronicus II, covering a period of which he was an eyewitness, from 1260 to the summer of 1307 (where the work breaks off abruptly). His original and personal narrative is couched in difficult archaistic Greek, and often presents problems of chronology. (135) (143) (149 – 150) (151) (158 – 159) (160)

Palamas Gregory (died 1357) [Gr.]

A Byzantine theologian, who was first a monk at Mt.Athos, and later became metropolitan of Thessalonica. (203)

Palmieri Matteo (1406-1474) [Lat.]

A Florentine spice dealer, humanist and politician. The work for which he is remembered is the treatise written in Italian *Della vita civile*. He also wrote two historical works: the *Liber de temporibus* (up to 1448) and the *Annales seu Historia Florentina* (1429-1474). (310 – 318)

Palmieri Mattia (died 1483) [Lat.]

A writer from Pisa (Tuscany); he compiled a chronicle entitled *Opus de temporibus suis*

(1448-1482). It was published in the first volume of the continuation of the *Rerum Italicarum Scriptores* (ed. Tartini, 1748). Care has to be taken to distinguish this author, who died in Rome in 1483, from the very similarly named Matteo Palmieri, who died in Florence in 1474. < 352 - 354 > < 358 >

Paolo de Paolo (14th - 15th c.) [Lat.]

A nobleman from Zara, in present-day Croatia. He wrote a *Memoriale* of events at Zara from 1371 to 1407. The original manuscript of the *Memoriale* is lost, but we have a 1668 edition by Giovanni Lucio, who traces the manuscript tradition of the work at the end of the text. The *Memoriale* as published by Lucio had been copied in 1544 by a certain Pietro Fanfoneus from an earlier copy made by Federico de Rosa, who in his turn had copied it from Paolo de Paolo's original. < 229 > < 233 > < 250 - 251 > < 261 >

Parisio da Cerea (13th c.) [Lat.]

An Italian notary from Verona (Italy). He wrote a Veronese chronicle which narrates events from 1117 to 1277. From 1206 onwards, it deals with events of the author's own lifetime, celebrating in particular the time of Ezzelino and Mastino della Scala. The chronicle was continued by an anonymous author. < 092 > < 105 > < 176 >

Peter of Blois (Petrus Blesensis) (c.1135 - c.1204) [Lat.]

A statesman and theologian, who was born at Blois (France). He studied law at Bologna and theology at Paris. In 1167, count Stephen of Perche took him to Sicily, where he became tutor to King William II and one of Marguerite of Navarre's chief counsellors. As a result of hostility on the part of court nobles, he was obliged to return to France in 1169. Around 1173, he moved to England, where he became a diplomatic agent in the service of Henry II. In 1176, he became chancellor to the archbishop of Canterbury and archdeacon of Bath, and was later appointed archdeacon of London. His numerous works and many letters have been collected together in the *Patrologia Latina*. < 087 >

Peter the Deacon (1107 or 1110 - c.1159/1164) [Lat.]

A monk from Montecassino Abbey. When Abbot Oderisius II fell from grace, Peter was also affected, with the result that he was obliged to leave the monastery in 1128. He was able to return about three and a half years later. He was appointed librarian and archivist, and took a leading role in the life of the monastery. He wrote numerous hagiographical and historiographical works, and continued the *Chronica Monasterii Casinensis*. This work had been started by Leo of Ostia at the year 568 and taken as far as 1075, and was subsequently continued by Guido, a pupil of the *grammaticus* Alberic of Montecassino. He subsequently became one of Peter's teachers, and died about 1130. His continuation was supposed to reach 1127, but we only know that form of it passed down by Peter, who continued the chronicle up to 1138. The *Chronica Monasterii Casinensis* survives in various manuscripts, some of which belong to the period when the work was compiled, while others are of later date. < 054 > < 059 >

(Le) Petit Thalamus de Montpellier (1326-1426) [Prov.]

A chronicle of the city of Montpellier (southern France) in Provençal, in a cartulary. It covers the period 1088-1426, and was compiled from the second quarter of the 14th century onwards by various contemporary writers. Published by Pegat *et al.* (1836-1840). < 213 - 221 >

Petrarca Francesco (1304-1374) [Lat.]

A famous Italian poet and humanist. He began his studies in France, moving subsequently to Bologna and then back to Avignon. From 1320 to 1326 he was busy writing poetry and travelling in France, Flanders, Germany and Italy. In 1353 he returned

permanently to Italy. Apart from his poetry and Latin works, he also wrote a vast number of letters which have been collected into a number of volumes. In them he narrates and recalls episodes from his own life. < 190 > < 192 - 196 >

Philip du Plessis (12th - 13th c.)

Grand Master of the Knights Templars. In June 1202 he wrote a letter to Arnold I, abbot of Cîteaux, about the large earthquake of 20 May 1202. The letter is one of the most important Latin sources for this event. The text of this letter is preserved in manuscript Dd 105, fol.149, in the Biblioteca Nacional in Madrid. It is an 18th century copy taken from the (now lost) manuscript HH. no.8 from the library of the convent of San Juan de los Reyes in Toledo. The text has been published in Mayer (1972, pp.308-10). < 097 >

Philippe de Navarre (13th c.) [Fr.]

He wrote the work known as the *Histoire de la guerre qui fu entre l'empereur Frédéric II et Johan d'Ibelin*. It was added — probably by Gérard de Montréal — to the *Gestes des Chiprois*, which narrates the deeds of Frederick in the Holy Land (1227-1230), but also includes events from the preceding years. < 104 >

Phocas John (last quarter of the 12th c.) [Gr.]

We have no reliable information about this pilgrim, who wrote a description of the Holy Land in the work *Descriptio terrae sanctae*. < 073 >

Piccolomini Enea Silvio (pope Pius II) (1405-1464) [Lat.]

A famous humanist and patron of the arts. He was secretary to the emperor Frederick III, and in 1450 was appointed bishop of Siena (Tuscany). In 1456 he was made cardinal, and on the death of Calixtus III in 1458, he was elected pope, taking the name Pius II. His chief work is his autobiographical *Commentarii* (1463). On 28 December 1456, he wrote a letter from Rome to the Hapsburg emperor Frederick III about the earthquake of 5 December 1456. It has been published in his *Epistole* (1518, no.CCXX). < 310 - 318 >

Pierozzi Antonino (1389-1459) [Lat.]

He was born in Florence and entered the Dominican Order in 1405. In 1436 he founded the convent of S.Marco in Florence, where he was prior from 1439 to 1444. He was a protector of artists such as Fra Angelico. In 1446, he was appointed archbishop of Florence. He spared no effort in coping with the plague of 1448 and the earthquake of 1453 in Florence. Amongst his works are a *Summa Moralis* and a *Chronicon*, which is an important source for the earthquake of 5 December 1456 in southern Italy. He later became a saint. < 303 - 304 > < 310 - 318 >

Pietro di Mattiolo (mid-14th c. - 1425) [It.]

In 1378 was appointed parish priest at the church of S.Michele del Mercato di Mezzo in Bologna. He wrote a chronicle covering the period from 1321 to 1424. Its original title has not come down to us, but it was published by Ricci in 1885 as *Cronica bolognese*. The autograph manuscript is preserved in Biblioteca Universitaria in Bologna (no.676). < 248 > < 262 > < 269 >

Pipino Francesco (c.1270 - c.1328) [Lat.]

A member of the Dominican Order, who wrote a *Chronicon* covering the period from the time of the Frankish king Faramund (5th c.) to that of pope Clement V (1304-1313). It is only of interest from 1176 onwards, when it ceases to be a pure compilation, and Muratori published it only from this book onwards. In publishing book XXV of the

Chronicon, Muratori mistakenly attributed it to a French author (Bernard the Treasurer who continued the work of William of Tyre), and gave it the title *Liber de acquisitione Terrae Sanctae*. < 124 > < 152 - 153 >

Plusiadenus John (c.1429-1500) [Gr.]

Became bishop of Methone (Greece) in 1483, using the name Joseph. As a theologian he was in favour of church union, and devoted a number of writings to that question. < 359 - 364 >

Psellus Michael (1018-1078) [Gr.]

A Byzantine statesman, philosopher, historian and rhetorician. His numerous works include treatises on psychology, works on anatomy and medicine, and a fragmentary encyclopedia. His speeches are famous as examples of style and contain much historical information. About five hundred letters, and a number of rhetorical exercises, poems, epitaphs and occasional writings are extant. His most valuable work is his *Chronographia* from 976 to 1077, forming a continuation to Leo Diaconus. < 029 >

Pucci Bartolomeo (15th c.) [It.]

He was a *capitano* of the Florentine republic, who lived at Fivizzano (northern Tuscany). On 10 May 1481 he wrote a letter (published by Sforza 1913, p.53) to the central Florentine administration, in which he describes the effects of the earthquakes of February and May 1481. < 352 - 354 > < 358 >

Quatrario Giovanni (1336-1402) [Lat.]

A poet from Sulmona (central Italy). At the time of the 1349 earthquakes, he and his family were at Sulmona. He has left a record of the earthquakes in his *Carmina*, an autobiography in Latin verse, published by Pansa (1912). < 192 - 196 >

Ralph of Caen (c.1080 - after 1131) [Lat.]

He was born at Caen (France) around 1080. He left for the Holy Land about 1107, but then decided to stop at Antioch with duke Bohemond and Tancred. After the death of the latter, then prince of Antioch, he wrote the *Gesta Tancredi in expeditione Hierosolymitana* between late 1112 and April 1118. The text is partly in verse and partly in prose, and was originally unfinished, ending at the taking of Apamea (14 September 1106). It was published in vol.III of the *Recueil des Historiens des Croisades*. < 043 >

Ralph of Coggeshall (d. 1228) [Lat.]

A Cistercian monk, who was abbot at Coggeshale (or Coggeshall), north-east of London, between 1208 and 1218. He left the post in the latter year. He wrote a *Historia Anglicana* and a *Chronicon Terrae Sanctae sive Liber de Expugnatione Terrae Sanctae*. < 054 > < 105 >

Raymond of Aguilers (c.1043 - 1105) [Lat.]

He was a canon at the church in Puy (France), and joined the first crusade as chaplain to Raymond IV of Toulouse. His *Historia Francorum qui ceperunt Iherusalem* was written before 1105 and narrates crusader events up to the Ascalon battle (12 August 1099). His work is one of the earliest assessments of the crusade by a participant, though he seems to have made use of an anonymous work entitled *Gesta Francorum* (c.1101). His *Historia* was published in vol.III of the *Recueil des Historiens des Croisades* in 1866, and subsequently republished in an English translation by J.H.Hill and L.L.Hill (1968). < 043 >

Razzi Serafino (1531-1611) [It.]

A Dominican theologian, who was born at Lucca (northern Tuscany). He spent many years in Ragusa (present-day Dubrovnik, in Croatia) and wrote a history of the city entitled *La storia di Raugia*, published at Lucca in 1595. < 355 > < 366 - 367 > < 380 >

Reichschroniken see *Chronica minora* (Byzantine 1-13).

Reinhard von Bimmelberg (15th c.) [Ger.]

An unidentified German nobleman, who went on a pilgrimage to Jerusalem in 1493. < 375 >

Riccobaldo da Ferrara (second half of the 13th - early 14th c.) [Lat.]

An ecclesiastic, canon in Ravenna (Italy). As a writer, he is chiefly known for the work called *Pomarium ecclesiae Ravennatis sive Historia Universalis*. The *Compilatio Chronologica* is also attributed to him, though without certainty. < 124 > < 160 > < 165 >

Richard of Poitiers (Pictaviensis) (c.1122 - after 1188) [Lat.]

He was a Cluniac monk, who wrote a universal chronicle from the creation of the world to 1172, as well as some poetry. The *Chronica* is mostly a compilation of early chronicles, and was subsequently used by Martin of Troppau (a Dominican chronicler) and Bernard Gui (see above) for their historiographical works. For his own times, the author records what he learned directly at the Cluniac priory on the island of Aix, near Rochefort, where he seems to have spent most of his life, and during journeys to various destinations, including England. Three different redactions of the work survive, reaching 1153, 1162 and 1172 respectively. The last of these was reworked and continued to 1174. < 061 >

Richard of San Germano (c.1165 - 1243) [Lat.]

An Italian notary in the monastery and town of San Germano (the early name of Cassino), where he was born. His official position makes him an authoritative source for many of the events he records, for he had access to important sources and documents, which he often reproduces word for word in the course of his narrative. He wrote two different redactions of his *Chronica*. The first is dedicated to abbot Stephen. It was begun shortly before the death of pope Innocent III (1216) and is in essence a continuation of the *Annales Casinenses*. The narrative begins with Innocent III's visit to Cassino in 1208 and ends at 1226. The second redaction deals with events in southern Italy, starting with the death of William II (1189) and ending in 1243, the year in which the author died. Amongst the codices in which it survives is a manuscript which is either autograph or at least a copy of the original made in the author's own lifetime. The first redaction, on the other hand, survives in a miscellaneous manuscript codex of the second half of the 14th century. < 107 > < 108 > < 109 >

Rinuccini Filippo (1392-1462) [It.]

A citizen of Florence, who wrote a chronicle of the city, covering the period 1282-1460; it was published by Aiazzi (1840) as *Ricordi storici*. The work was continued by his son Alamanno for the years 1461-1499 and by another son, Neri, for the years 1499-1506. < 303 - 304 > < 325 - 332 >

Rizzoni Giacomo (16th c.) [It.]

A chronicler of the city of Verona, who continued Pier Zagata's chronicle for the years 1471-1521. < 371 >

Robert of Auxerre (Robert Abolant or Abolans) (1156-1212) [Lat.]

A monk in the monastery of St. Marien at Auxerre (France) from 1204 onwards. He wrote a *Chronicon* covering the period from the creation to 1211, which was continued by other hands up to 1228. (097)

Robert of Torigny (d. 1187) [Lat.]

He was prior of Bec (Brittany) in 1149, and became abbot of Mont St. Michel (France) in 1154 (hence he is sometimes called Robertus de Monte). His *Chronica* covers the period from 385 AD to 1186 and derives from that of Sigebert of Gembloux (see Anselm of Gembloux), with additions and amplifications for the history of Anglo-Norman regions in the period 1100-1186. (076 - 080) (087) (089)

Roger of Hoveden (died 1201-1202) [Lat.]

He was born in Yorkshire (England) at an unknown date. At the time of Henry II of England he was *Clericus regis*, and appears to have been closely involved with the royal court as early as 1173, carrying out various judicial duties in the north of England. After the death of Henry II (1197), he retired to write his *Chronica*, which is an account of affairs in the Kingdom of England from 449 to 1201. His information about the period 1154-1192 seems to derive from another work, the *Gesta Henrici*, attributed to Benedict of Peterborough. *The Annals of Roger of Hoveden* was published by H.T. Riley (London, 1853) in 4 vols., and the *Chronica* was republished in the *Monumenta Germaniae Historica* by Liebermann and Pauli in 1885. (087)

Rolandino of Padua (1200-1276) [Lat.]

A Paduan notary, who studied grammar and rhetoric at Bologna. From the second half of the 13th century onwards, he wrote a chronicle (1200-1262) entitled *Chronica in factis et circa facta Marchie Trivixane*, the first part of which derives from a lost chronicle of the March of Treviso. Published by Bonardi (1905-1908) in the new edition of the *Rerum Italicarum Scriptores*. (105)

Romuald of Salerno (early 12th century - 1181) [Lat.]

He held an important position in cultural and political life at the court of Palermo, and wrote a universal *Chronicon* up to 1178. For the period from the end of the 9th to the 12th century the chronicle becomes important as an independent source in its own right. (054) (087)

Rucellai Paolo (15th c.) [It.]

A Florentine merchant, who was in Naples at the time of the earthquake of 5 December 1456. He wrote two letters about it to his brother Giovanni on 8 and 14 December. Copies of the letter of 8 December have been published in the *Rerum Italicarum Scriptores*, firstly in the *Historia Miscella*, edited by Muratori (vol. 18, cols. 723-4), and then in the *Corpus chronicorum bononiensium*, edited by Sorbelli (1927, vol. 18/1, pp. 246-8). The letter has been published in Perosa (1960, pp. 57-9), along with that of 14 December (pp. 59-60). (310 - 318)

Sächsische Weltchronik. Zweite Bairische Forsetzung (14th c.) [Ger.]

A Bavarian continuation in Old German of a Saxon chronicle. (190)

al-Sakhawi, Shams al-Din Abu al-Khayr Mohammad b. 'Abd al-Rahman (1427-1497) [Arab.]

A Shafi'ite historian, who came from Cairo and died at Mecca. Ibn Hajar al-Asqalani was one of his teachers, and he went on numerous journeys to Aleppo, Damascus and Jerusalem. (356)

Salimbene de Adam (1221-1287) [Lat.]

An Italian monk and intellectual. Salimbene came from Parma, and entered the Franciscan Order in 1238. In 1247 he went to France, where he was close to the Joachimite movement (named after the preacher and mystic, Joachim of Fiore, 1130-1202), whose ideas were taken up by the most intransigent wing of the Franciscans; but he distanced himself from them in the 1260s. While in France, he also met John of Pian del Carpine, who had travelled to the lands of the Tartars. The only work of his to survive is a *Chronicle*, part of which is missing. It is nevertheless very useful and important for an understanding of the society of his time.

< 105 > < 113 > < 132 > < 133 >

Salomon ben Zemah (11th c.) [Hebr.]

According to Gil (1983), he was a Jew living at Ramla (in present-day Israel) at the time of the earthquake of 5 December 1033. A letter of his is probably intended for a friend called Ephraim ben Shmaria, who lived in Egypt. The letter was published earlier by Mann (1920), who identified the writer as Salomon ben Yehuda. < 012 >

al-Samhudi, Nur al-Din Abu al-Hasan 'Abdallah b. Ahmad (1440-1506) [Arab.]

An Egyptian historian, who was born at Samhud. After undertaking religious studies, he spent a long period at Medina before returning to Egypt. His *Wafa' al-wafi* is a history of the city of Medina. < 359 - 364 >

Samuel of Ani (Samuel Anec'i) (1113-1166) [Arm.]

An Armenian chronicler, who may have been in the service of the patriarch Gregory III of Cilicia (Turkey). The first part of his *Chronicle* derives from Eusebius, while the second part (from the birth of Christ to 1179) consists of chronological tables listing individual events and linking them to his dating system. His work was subsequently continued by various copyists and chroniclers up to 1665 (see *Chronica minora*, Armenian). < 002 > < 063 > < 068 > < 086 > < 142 > < 164 > < 208 >

Sanseverino Giovanna (15th c.) [It.]

She became countess of Caiazzo on marrying Roberto Sanseverino (see below). A letter from her to Bianca Maria Visconti, duchess of Milan, about the earthquake of 15 January 1466 has been published in Figliuolo and Marturano (1996); the original is in the Archivio di Stato at Milan (*Sforzesco*, 215, Napoli, fol.118). < 336 >

Sanseverino Roberto (15th c.) [It.]

He was count of Caiazzo (Caserta, southern Italy), and belonged to one of the most noble families in the Kingdom of Naples, being a nephew of Francesco Sforza, duke of Milan. He wrote three letters about the earthquake of 15 January 1466: to Bianca Maria Visconti, duchess of Milan, and to duke Francesco Sforza, which have been published in Figliuolo and Marturano (1996); the originals are in the Archivio di Stato at Milan (*Sforzesco*, 215, Napoli, fols.117, 119, 127). < 336 >

Sanudo Marin, known as "the Younger" (1466-1536) [It.]

A descendant of Marin Sanudo the Elder, but from another branch of the family. He was a tireless scholar and collector of printed books and manuscripts, and in addition to minor writings, he was responsible for a substantial work entitled *Le vite dei Dogi*. It begins at the earliest times and comes up to Doge Agostino Barbarigo (1494). The work underwent successive revisions and additions, at least until 1530. His monumental work is the *Diari*, which he regularly updated from 1496 to 1533, and which prove to be of great importance, because Sanudo was personally involved in many of the principal events in the Venice of his day. < 356 > < 359 - 364 > < 369 > < 375 >

Sawirus b. al-Muqaffa' (died late 14th c.) [Arab.]

A Coptic historian and writer. He began his career as a public official before becoming a monk and then a bishop. He was one of the first Copts to compile a work in Arabic on the Coptic church, of which he was a strong defender. It took him ten years to gather together the materials for his book on the history of the Patriarchs, which is a rich source of information about the Coptic Church and political and social life in Egypt. < 012 > < 048 >

Scasilio Pietro (13th c.) [Lat.]

An Italian monk, who wrote the *Cronica Sambucinese* in 1270. It is preserved in the Ferrando family archive at Acri (southern Italy). < 093 >

Scutariotes Theodore (born c.1230) [Gr.]

An ecclesiastical official and metropolitan of Cyzicus (Turkey) (1277-1282). He is thought to be the author of an anonymous chronicle of events from the creation to 1261. < 108 > < 112 >

Scylitzes John (born after 1045) [Gr.]

A Byzantine historian of whose life we know very little. He was born after 1045, and about 1100 he wrote a chronicle of the years 811-1057. The *continuatio* for the years 1057-1079 is a paraphrase of Attaliates (see above).

< 003 - 004 > < 010 > < 011 > < 012 > < 013 > < 015 > < 016 > < 017 > < 018 > < 019 > < 020 >

Secunda vita Clementis VI (1290/91 - 1352) [Lat.]

Deals with the most important events in the life of Clement VI (1342-52). The edition published by Muratori in *Rerum Italicarum Scriptores* (vol. 3/2, 1724, cols. 562-569) follows that of Baluze, *Vitae Papae Avenionensis*, Paris 1693. < 192 - 196 >

Sforza Galeazzo Maria (1443-1476) [It.]

The son of Francesco Sforza and Bianca Maria Visconti. He was born at Fermo (central Italy), and when his father died in 1466, he became duke of Milan. He was skilled at arms, a respected politician, an administrator with great intuitive skills, and a careful diplomat, but he was of a proud and vengeful disposition. He died young, on 26 December 1476, when three assassins ambushed him on the steps of the church of S.Stefano in Milan as he was on his way to a service. A few days after the earthquake of 7 May 1473 he sent a letter to his ambassadors in Bologna, Florence, Rome and Naples in order to find out what effect the earthquake might have had in those cities. The letter is quoted in Gazzini *et al.* (1991). < 344 >

Sforza Ippolita (1445-1484) [It.]

She was a daughter of Francesco Sforza, duke of Milan, and married Alfonso of Aragon, duke of Calabria and eldest son of king Ferrante of Aragon. She wrote a letter about the earthquake of 15 January 1466 to her mother, Bianca Maria Visconti, duchess of Milan. It was first published in Motta (1887) and republished in Figliuolo and Marturano (1996); the original is in the Archivio di Stato in Milan (*Sforzesco*, 215, Napoli, fol.116). < 336 >

Shelomoh ben Mosheh ben Yekutiel Mi ha-Adummim [de Rossi]

(died in 1284) [Hebr.]

He wrote an expiatory prayer (*selicha*) entitled "For the earthquakes which took place at Ancona", probably to be recited in the Ancona synagogue on a day of fasting and penitence, and probably to commemorate the earthquake of 1269. The manuscript is now in the Biblioteca Palatina in Parma (*Parm.*, 3536, fols.76b-77b, no.73), and forms part of a codex containing a collection of *selichoth* (expiatory prayers). The Hebrew text was published by Laras (1973, pp.51-2) with an Italian translation. < 124 >

Sibt Ibn al-Jawzi, Shams al-Din Abu 'l-Muzaffar Yusuf b. Kizoghlu

(1186-1256) [Arab.]

An Arab historian, who was a nephew and pupil of the famous historian Ibn al-Jawzi. His *Mir'at al-zaman* is a chronological history which also includes obituaries of famous people. Sibt Ibn al-Jawzi's fidelity to his sources and his use of quotations from other writers make his work valuable evidence of numerous lost texts. (089) (097)

Sifridus de Balnhusin (before 1275 – the early decades of the 14th c.) [Lat.]

He was parish priest at Balnhusin (present-day Gross-Ballhausen in the district of Erfurt in Thuringia, Germany). Scarcely anything is known of his life. In the early 14th century, he began writing a world history which reaches 1304. It survives in a manuscript copy published by Holder-Egger (1880), who thought it was autograph. Being dissatisfied with his first version, Sifridus undertook a second, which is a more extensive reworking. He called it *Compendium historiarum*, and it is preserved in an autograph manuscript of which there are various apographs. It is in the form of a compendium of information taken from earlier literature. For the more recent historical period, he used a great number of sources, including the *Chronicon S. Petri Erphordiensi* and other brief 13th century chronicles which have not survived. (152 – 153)

Simonetta Cicco (c.1410? – 1480) [It.]

A native of Calabria. At first he was a chancellor and secretary of Francesco Sforza. When Francesco Sforza was proclaimed duke of Milan in February 1450, the influence of the Simonetta family at court increased still further, and Cicco was put in charge of the duke's chancery. The codices containing Cicco Simonetta's *Diari* are preserved amongst the papers of his personal archive, which were transferred to the Sforza ducal archive after his death. The surviving *Diari* begin at the year 1473 and reach 1478, following events in the Duchy of Milan in the period when Francesco Sforza and his son Galeazzo Maria were in power. The diaries for 1477 and 1479 are lost, and it is impossible to know whether diaries preceding 1473 ever existed. The *Diari* are written in Italian, but with interspersed Latin passages. (344)

Smbat Sparapet (Constable Smbat) (1208-1276) [Arm.]

An Armenian historian from Cilicia, brother of king Het'um II, and author of a chronicle of events from 951 to 1272, subsequently continued by an unknown hand up to 1331. As it has come down to us, the text has gaps: the sections for the years 951-974, 1023-1029, 1063-1064, 1070, and 1230-1251 are missing. However, the text acquires importance as a historical document from 1163 onwards. Up to that date it is essentially a reworking of Matthew of Edessa and the continuation of his work by Gregory the Priest. We still lack a genuine critical edition. Up to now, extracts have been published and used by scholars under the title *Royal Chronicle of Armenian Cilicia*. (041) (123)

Sozomeno da Pistoia (1387 – 1458) [Lat.]

A Italian humanist, ecclesiastic and teacher at the Florence *Studium*, he wrote a *Chronicon universale*. His early years were spent at Pistoia. He became an authority in the field of canon law, and clashed on a number of occasions with the bishops of Pistoia. In late 1417, he was in the retinue of pope Martin V at the Council of Constance. He was in contact with other humanists at the Council, such as Poggio Bracciolini, and joined them in visiting the monastery of St. Gall (Switzerland) in search of early codices. From 1432 onwards, Sozomeno devoted himself to writing his *Chronicon universale*. It is an imposing work, which begins in ancient times and comes up to his own day, his intention being to embrace the whole of world history. Zaccagnini's edition (1907-1908) contains only the final part of the work, covering the years 1411-1455. (303 – 304)

Sphrantzes George (1401 – after 1477) [Gr.]

A Byzantine historian. After the fall of Constantinople (1453), he lived in Greece, from where he went on a number of journeys and embassies. Two historical works, known as the *Chronicon Minus* and the *Chronicon Maius*, have been attributed to him. They are respectively a narration of events between 1401 and 1477, and a narrative compilation of events from 1258 to 1481. Recent studies have shown, however, that the so-called *Chronicon Maius* (referred to here as "Pseudo-Sphrantzes") is in fact a 16th century re-elaboration by Makarios Melissenos, metropolitan of Monemvasia. Nevertheless, some scholars think it is a reworking of information which derives largely from Sphrantzes himself. (305) (339)

Step'annos (12th c.) [Arm.]

An Armenian bishop of Ganjak about whom we have no biographic information.

(068)

Step'annos (or Step'anos, Orbelean or Siwnec'i) (13th c.)

An Armenian historian, who wrote a history of the canton of Siwnik' from its origins to 1299. Amongst the sources he used in compiling his history were local writers whose works are now lost. (068)

Storie Pistoresi (14th c.) [It.]

This anonymous historiographical work is primarily concerned with Pistoia (Tuscany) in the period 1300 [1293] – c. 1348. Some think it may have been written by more than one person. Five manuscripts survive. The earliest is dated 1396, and was written by Iacopo di Franceschino degli Ambrogi, a member of a noble Pistoia family whom some considered to be the work's author. The other four manuscripts belong to the 16th century, one of them being a direct copy of the one dated 1396. The longest and most complete text is that in the earliest manuscript. Up to the year 1310, it adheres strictly to the history of Pistoia. The second part of the *Storie* begins in 1310, and concerns the revival of Ghibelline fortunes. From 1329 onwards, the narrative is primarily concerned with events in the Lombard *signorie*, and then broadens out to embrace a wider European context. (145)

Strozzi Filippo (1428-1491) [It.]

A merchant and banker and a member of a noble Florentine family. During exile in Spain and at Palermo and Naples, he made a very large fortune. When he returned to Florence in 1466, he entered political life, and began building the famous Strozzi family *palazzo*. He was in Naples at the time of the earthquake of 5 December 1456, and wrote about it to his mother, Alessandra Macinghi-Strozzi, on 8 December, in a letter which appears in the collection of his letters published by Guasti (1877, pp.138-40).

(310 – 318)

Supplementum Annalium Cremonensium (11th-12th c.) [Lat.]

This text was added as a *Supplementum* to the *Annales Cremonenses* (see above) by its editor, Holder-Egger (1903). The historical information it provides is drawn partly from the chronicles of Sicard of Cremona and Albert of Bezanus, and fills the gaps left by the lost *Annales Cremonenses*. (054)

Suriano Francesco (1450-c.1530) [It.]

He came of a noble Venetian family, and began travelling in the East as a very young man (he went to Alexandria in 1462, and subsequently to Tripoli, Tyre, Gaza, etc., making at least 16 journeys), following his father and uncles in managing the family businesses. He continued to do this until 1475, when he entered the Franciscan Order; in

1481 he was made guardian of the Beirut convent. In 1483, however, he was transferred to the principal Franciscan community in the Holy Land, at Mount Sion in Jerusalem, where he may have been secretary to the superior. He was recalled to Italy in 1484, and his own account of his adventurous return journey contains our principal evidence for the earthquakes which struck the Aegean and Cyprus. Suriano's principal work, is his *Trattato di Terra Santa e dell'Oriente*, which went through three successive redactions (1484, 1514, 1424). < 333 > < 334 > < 356 > < 359 - 364 > < 375 >

al-Suyuti, Abu al-Fadl 'Abd al-Rahman b. Abi Bakr b. Muhammad Jalal al-Din al-Khudayri al-Shafi'i (1445-1505) [Arab.]

A prolific writer and polymath of Persian origin, who lived in Baghdad and later at Suyut (Egypt). His written works in Arabic are concerned with religious studies and textual analysis, and one of his books is devoted to the "Medicine of the Prophet". He was also a famous historian of the period of Mamluk influence, and is unique among historians in having written a book on earthquakes, known as *Kashf al-salsala fi wasf al-zalzala*. < 021 > < 024 > < 037 > < 097 > < 101 > < 118 >

< 121 > < 147 > < 160 > < 170 > < 178 > < 260 > < 319 > < 345 > < 356 > < 368 > < 370 > < 375 >

Synaxarium Alexandrinum (12th - 13th c.) [Arab.]

This book is a collection of biographies of martyrs, angels and prophets written by Coptic bishops: Mikha'il, Malih and others. It begins at the first of the month of *tut* in the Coptic calendar (which coincides with the day of the autumnal equinox), and covers all twelve months of the calendar. < 048 >

Syropulus Sylvester (Syrop.) (c.1400 - after 1453) [Gr.]

A high-ranking prelate in the Byzantine patriarchate (who was born and died at Constantinople). He was a member of the delegation to the councils of Ferrara and Florence in 1438-1439. He later wrote his memoirs. They were composed shortly after 1443. < 293 > < 294 > < 295 >

Talamanca Gaspare (15th c.) [It.]

At the time of the earthquake of 5 December 1456, he was the royal Aragonese secretary. In a letter of 13 January 1457, written from Naples to duke Francesco Sforza, he mentions the aftershocks which were felt in the city. The letter is quoted in Romano (1888, pp.783-4). < 310 - 318 >

Templier de Tyr, Chronique (early 14th c.) [Fr.]

This is the third of the three chronicles in the collection known as *Les Gestes des Chiprois*, the other two being the *Chronique de Terre Sainte* and the *Histoire de la guerre qui fu entre l'empereur Frédéric II et Johan d'Ibelin*. The author follows events in the Holy Land up to the fall of Acre (1291) and then deals with events in Cyprus up to 1309. He was close to the entourage of the Order of Templars, and probably worked as secretary to the Grand Master Guillaume de Beaujeu, who was killed in battle during the taking of Acre. The author subsequently moved to the island of Cyprus and seems to have progressively distanced himself from the Order of Templars. It has been suggested that he was Gérard de Montréal, a juriconsult responsible for negotiating the release of king Henry II of Cyprus in 1310 (see Luke 1975, pp.344-5). < 160 >

The continuer of Ibn Duqmaq (15th c.) [Arab.]

The anonymous and untitled manuscript Ar. 5762 in the Bibliothèque Nationale de France records events which took place from the end of the reign of Abu Bakr up to 839 of the Hegira [1435-1436]. The only suggestion that it is in fact the *Kitab al-Jawhar*

al-tamin fi sirat al-khula' wa-l-salatin by Ibn Duqmaq is found in a note glued to the cover. It has become the practice to call the anonymous author of this text "the continuer of Ibn Duqmaq". (281)

Theoctistus Stoudites (14th c.) [Gr.]

A Byzantine hagiographer and hymnographer, who wrote a *Life* of the patriarch Athanasius I (c. 1235 – c. 1315). (158 – 159)

Thomas of Eccleston (first half of the 14th c.) [Lat.]

A Franciscan friar and chronicler, whose exact dates of birth and death are not known. He probably entered the order about 1232-33 and was a student at Oxford between 1230 and 1240. He then settled at their London convent. He is famous for his *De adventu fratrum Minorum in Angliam*, which deals with the earliest activities of the Franciscans in England. It covers the period 1224-1258, at which point the work was probably brought to an end. (105)

Thomas of Spalato (c.1200 – 1268) [Lat.]

Perhaps he was born at Spalato (Split, Croatia). He studied at Bologna, where he heard a public sermon by St. Francis in 1222. He began his career as a notary in the Commune of Spalato, and subsequently became a canon of the cathedral chapter. In 1230 he was elected archdeacon of Spalato and became bishop in 1243. He probably began the composition of his *Historia Pontificum Salonitanorum atque Spalatensium* between 1245 and 1251. The work is not only a chronicle of the bishops of ancient Salona and medieval Spalato, but also a history of the town. (105)

Tolomeo da Lucca (Bartolomeo Fiadoni) (c.1240-1327) [Lat.]

We know something of his life from 1272 onwards. At that time he already belonged to the Dominican Order, and in that year he accompanied Thomas Aquinas to Naples and worked with him there. On several occasions between 1285 and 1302 he was prior of the convents of S.Romano at Lucca and S.Maria Novella in Florence, and he had occasion to make long journeys, arriving at the papal court at Avignon in 1309. He was elected bishop of Torcello (Venice) in 1318, but as a result of clashes with the patriarch of Grado, he was imprisoned for five years. He was a very prolific writer. Amongst his surviving works in philosophy, law and history, are the *Annales* (which cover the period 1061-1303) and the *Historia Ecclesiastica* (from the birth of Christ to 1321). (125) (145) (146) (152 – 153)

Tolosano see *Chronicon Faventinum*

Torrallas Joan (1365-1428) [Cat.]

A citizen of Vic, whose diary has come down to us in a transcription made at Girona (Catalonia) shortly after 1510 by Antoni Vicens. It contains a collection of reports about disasters which struck Catalonia between 1365 and 1427. The diary has been published by Moline i Brases (1915-1917). (213 – 221)

Tummolillo Angelo (1397 – c.1480-85) [Lat.]

A notary and chronicler, who was born at Sant'Elia (Frosinone, central Italy), the son of Giovanni Tummolillo, also a notary. From 1427 to 1435 he was secretary to queen Joanna II of Anjou at the court of Naples. He later returned to Sant'Elia and worked as a notary again. In 1460 he went back to Naples, this time as a notary, to take part in a meeting of the General Parliament of the Kingdom which had been summoned by king Ferdinand I of Aragon in order to decide what measures to adopt to counter an invasion by duke John of Anjou. In 1470 he wrote a chronicle enti-

ted *Notabilia temporum*, a critical edition of which was published by Corvisieri (1890) in the *Fonti per la Storia d'Italia*. (310 - 318) (325 - 332) (336)

Ubertino de Romano (1240-1306) [Lat.]

A chronicler native of Modena (northern Italy), who moved to Verona around 1266-1267. Between 1275-1280 he began to write his *Annales Veronenses* (1259-1303), published by Cipolla (1890). (133)

al-'Udhri, Abu 'l-'Abbas Ahmad b. 'Umar b. Anas, Ibn al-Dala'i

(1003-1085) [Arab.]

A Spanish geographer, who was born and died in Almeria. While still very young, he went on a pilgrimage to Mecca, where he spent 10 years (1016-1025). Only fragments of his voluminous geographical work survive, but it is nevertheless possible to gain some idea from them of the work's contents, at least as far as the part about Andalucia is concerned. The detailed descriptions of provinces and individual localities are so rich in specific fiscal, economic and administrative data as to suggest that he must have made use of archive sources. One important aspect of his work is the numerous items of historical information about natural phenomena as well as military and political history. (026)

al-'Ulaimi, 'Abd al-Rahman b. Muhammad al-Qadi Mughir al-Din al-Hanbali

(1456-1522) [Arab.]

An Arab historian from Jerusalem. He wrote a commentary on the Koran, a collection of biographies of jurists of the Hanbalite school, and a general history up to 896/1491 with particular emphasis on Jerusalem. His principal work is a history of Jerusalem and Hebron in two volumes (*al-Uns al-jalil fi ta'rikh al-Quds wa 'l-Khalil*). All that survives is the history of Jerusalem and part of the holy places, consisting of a description of the city and its holy places, the history of the conquest of Jerusalem and events from the destruction of the Holy Sepulchre to the final reconquest of the city, together with brief information about the most important towns in Palestine. Amongst the work's sources are official documents from Jerusalem institutions, *Muthir al-gharam* by Shihab al-Din al-Maqdisi and *Kitab al-fada'il bayt al-maqdis* by Abu'l-Ma'ali'l-Musharraf b. al-Murajja. (012) (324)

Vardan Arewelc'i (c.1200 - 1271) [Arm.]

A learned Armenian (who was born in Cilicia, and died at Xor Virap), amongst whose writings is a *Historical composition*, which provides a selection of the principal events in Armenian history from the creation to 1267. (103)

Versus Babenbergenses (14th c.) [Lat.]

A verse composition written at Bamberg (Germany), covering the period 1322-1349. Published by Jaffé in the *Monumenta Germaniae Historica* (1861). (190)

Villani Giovanni (c.1280-1348) [It.]

A Florentine chronicler. He was the son of merchants and a merchant himself, and hence moved in the circles of the great companies of Florentine bankers such as the Peruzzi and the Bardi. He made frequent journeys to France and Flanders in the early 1300s, and was later in Naples and Siena. He carried on intense political activity as a moderate Guelf. He became prior on three occasions: in 1316, 1321 and 1318, was an official of the Mint, and a member of the commission for tax reform; and from 1328 to 1330 he was one of those officially appointed to help feed the populace during the famine. He died in Florence during the outbreak of plague in 1348. His *Nuova Cronica* is a chronicle of Florence from earliest times to 1348. He began the twelve

books of his chronicle about 1306. The earlier part of the work, up to book 6, is a compilation. From the sixth book to the twelfth, he deals with more recent events, finally reaching those of which he had personal experience. For the most recent events, he used first-hand official documents. The chronicle is of considerable documentary importance because of the wealth and reliability of the information it provides.

< 173 > < 185 - 186 > < 190 >

Villani Matteo (d. 1363) [It.]

A member of a Florentine family. His more famous brother Giovanni (see above) wrote the *Nuova Cronica*, which deals principally with events in Florence. Matteo continued Giovanni's work for the period 1348-1363, and Matteo's son Filippo added the events of the following year.

< 190 > < 192 - 196 > < 200 - 201 > < 203 > < 205 > < 207 >

Villola Pietro (died after 1362 and before 1368) and **Floriano di Pietro**

(died closing years of the 14th c.) [It.]

Two Bolognese chroniclers, father and son. Pietro was involved in the city's political life, and was one of the *Anziani* in the last two months of 1360. He was a paper merchant, and as such was one of the suppliers to the Commune of Bologna and the Company of Notaries there. He compiled a chronicle of Bologna, and after 1362 his place as writer of the text was taken by his son Floriano, who carried on the same trade as his father for some years. He died in the closing years of the 14th century. From 1334 onwards, the *Cronaca* deals with events contemporary with the actual writing of the chronicle, whereas for the earlier part, the author copied or summarised earlier sources which are now lost (mostly in Latin up to 1316). The *Cronaca Villola* is the only 14th century chronicle which has come down to us in autonomous form, apart from being used in later compilations.

< 190 > < 192 - 196 > < 200 - 201 > < 210 >

Walter the Chancellor (active in the first quarter of the 12th c.) [Lat.]

He was in the service of two leaders of the crusades: Bohemond (d. 1111) and Tancred of Hauteville (d. 1112), who was in charge of the principality of Antioch from 1098. When Tancred's cousin Roger of Salerno governed the principality (1112-1119), Walter was an administrator there for three years. His work entitled *Bella Antiochena*, is in two parts: the first part narrates the prince's victories in 1115, and is based on eyewitness accounts; the second tells of the defeats of 1119 (when Roger was defeated and killed in battle near Aleppo). The first part was written in 1119, and the second between 1122 and 1124. Between 1119 and 1122, after Roger's defeat, he was held prisoner.

< 051 > < 052 >

William of Nangis (1250-1304) [Lat.]

A monk in the monastery of St. Denis (France), whose *Chronicon* depends on that of Sigebert of Gembloux (see Anselm of Gembloux) for the period up to 1113. From that point onwards, however, he broadens his sources, and also includes original items of information. He also wrote about the *gesta* of two kings of France: Louis IX (1226-1270) and Philip III (1270-1285).

< 152 - 153 >

William of Rubruck (c.1215-30 - after 1256) [Lat.]

A Franciscan missionary, who was born in the village of Rubruc, near Cassel, in Flanders (now part of northern France). We do not know the exact dates of his birth or death. He may have accompanied king Louis IX of France on the crusade which the latter led in 1248 and during which he was taken prisoner in Egypt. In 1253 William of Rubruck set off on a long journey which took him as far as the court of the Great Khan of the Mongols. He left Constantinople on 7 May 1253, and by the end of December had reached the camp of the Great Khan, a few miles south of Karakorum, the ancient capital of the Mongol empire. He left Karakorum in August 1254. On his

return journey, he crossed central Asia, made his way through the Caucasus and into Anatolia, where, in February 1255, he observed environmental effects in the region struck by the Erzincan earthquake of 11 October 1254. His long journey came to an end at Tripoli, in Syria, on 15 August 1255. William of Rubruck has left a detailed account of his journey to Mongolia in a Latin work entitled *Itinerarium*, which was first published by Hakluyt in 1589. Van den Wyngaert's critical edition of 1929 is based on a collation of the four most important manuscripts of the work, three of which (dating to the 13th and 14th centuries) are at Corpus Christi College in Cambridge, while the fourth (dating to the 15th century) is in the British Museum (London). < 115 >

William of Tyre (c.1127 – c.1187) [Lat.]

Considered to be the greatest writer of Latin in the Holy Land. He was born perhaps in Syria, came to the West to study, and returned to Syria about 1162. He became archdeacon in Jerusalem, and subsequently archbishop of Tyre in 1175. He spent many years at the court of the king of Jerusalem, acting as tutor to King Baldwin IV (1174-1185) and later as chancellor. He was a man of enormous culture, having a thorough knowledge of sacred and profane Latin literature; and he could understand Greek and Arabic as well. His *Historia rerum in partibus transmarinis gestarum* narrates the history of the Kingdom from the time of the conquest to the time of William's second departure for the West in 1184. For the period up to 1127, he uses the works of Albert of Aix, Raymond of Aguilers (see above), Fulk of Chartres (see above) and Baudri of Bourgueil; for the period after 1150, his narrative is original and therefore a source of major importance. He also wrote a *History of the East*, that is to say, a history of the Arab princes, but it has not survived. He went to Rome in 1184 and died there shortly afterwards. His *Historia* was translated into French with the title *L'estorie de Eracles empeureur et la conquete de la terre d'Outremer* (see above), or *Livre du conquest*. < 051 > < 089 >

al-Yafi'i, 'Abdallah ben As'ad b. 'Ali b. Uthman b. Falah al-Shaff'i (c.1300-1367) [Arab.]

A Shaff'ite historian, who is known for his Sufism. He was born in Yemen, settled at Mecca and went on journeys to Jerusalem and Damascus. His *Rawd al-rayahin* includes the biographies of about 500 saints and Sufis, whereas his *Mir 'at al-janan* is no more than a compilation. < 137 > < 177 >

Yaqut al Hamawi, Shihab al-Din Abu 'Abdallah Ya'qub b. Abdallah al-Hamawi (1179-1229) [Arab.]

A famous compiler whose parents were not Arab — hence his *nisbah*: *al-Rumi*. He was taken to Baghdad as a slave and worked for a merchant for whom he undertook numerous journeys. After gaining his freedom, he worked as a copyist and went on numerous journeys for commercial purposes. His *Mu'jam al-buldan* is a valuable work of human geography. < 027 >

al-Yunini, Musa b. Muhammad b. 'Abd Allah al-Ba'albaki al-Hanbali (1242-1326) [Arab.]

An Syrian historian from Damascus. He studied at Hamah and in Egypt, and died at Ba'albek. His work is entitled *Dhail mir'at al zaman*. < 121 >

Zambotti Bernardino (c.1460 – first half of the 16th c.) [It.]

A doctor of civil law and a member of a wealthy Ferrarese family. Zambotti was taught by the humanist Codro Urceo Antonio da Rubiera, and subsequently studied at Ferrara university, where he graduated in civil law. He held various public posts at Mantua and Reggio Emilia. Zambotti wrote a *Diario ferrarese*, in which much of the first-hand information came from his cousin Zaccaria, a physician who lived at the court of Ercole

I d'Este. He started writing his *Diario* when he began his university studies, confining himself to events concerning Ferrara. Later on his narrative also included events in other parts of Italy — particularly those towns where his work took him. The only autograph manuscript is in the Biblioteca Comunale Ariostea in Ferrara. It shows that the work was effectively a collection of notes, which Zambotti may have intended to translate into Latin. In fact he gave his text the title *Silva chronicarum*; later historiography was responsible for calling it *Diario ferrarese*. (369) (371) (381)

Zibaldone da Canal (second half of the 14th c.) [It.-Ven.]

A Venetian manuscript containing miscellaneous information. The original text is at Yale University, (Connecticut, USA), and a printed edition was edited by Stussi in 1967. The manuscript takes its name from Nicolò da Canal who owned it in the first half of the 15th century. Folios 57r-59r. contain a brief chronicle of Venice. (160) (161)

Zonara John (died after 1159) [Gr.]

A Byzantine historian and writer on ecclesiastical subjects, who held an official position at the court of Constantinople. He became a monk around 1118 and retired to the Monastery of Mt.Athos. In addition to an epitome of world history from the creation to the year 1118, he wrote various commentaries on canon law and some hymns. (010) (039)

Zorzi Marsilio (13th c.) [Lat.]

He was the Venetian *baillo* (ambassador) to Syria. In a letter dating to October 1243 he refers to a group of properties in the city of Tyre, some of which had been destroyed in an earthquake which he does not identify. It is likely that the writer is referring to damage caused by the 1202 earthquake. The letter has been published in Röhricht (1893, no.1114). (097)

Zurita Jerónimo (1512-1580) [Cat.]

Appointed chronicler to the Crown of Aragon in 1548. After intensive studies in the principal archives, especially those of Barcelona, he published his most important work, the *Anales de la Corona de Aragon*, between 1562 and 1579. Its thirty books constitute the most important historiographical work for the 15th century in Iberia. The most recent edition is that by Canellas (1967-1986). (213 - 221)

Zuvaro Antonio (died in 1348) [Lat.]

An Italian cleric, official notary and, from 1343 onwards, mansionary at the bishop's court in Padua. The outbreak of plague in 1348 was probably responsible for his death. The evidence he provides about Paduan affairs in the first half of the 14th century consists of a series of notes written amongst the notarial deeds for which he was responsible. They were found and published by Sambin (1953). (190)

Bibliography

Abbreviations

AAbbMontec	Archivio dell'Abbazia di Montecassino
ABCapVercelli	Archivio e Biblioteca Capitolare, Vercelli
ACapBs	Archivio Capitolare, Brescia
ACapMo	Archivio Capitolare, Modena
ACapPc	Archivio Capitolare di Sant'Antonino, Piacenza
ACapVeroli	Archivio Capitolare, Veroli
ACArBarcelona	Arxiu de la Corona d'Aragón, Barcelona
ACattCampob.	Archivio della Cattedrale, Campobasso
AConvSDom, Bologna	Archivio del Convento di S.Domenico, Bologna
ADiocVt	Archivio Diocesano, Viterbo
AMCervera	Arxiu Municipal, Cervera
AMLleida	Arxiu Municipal, Lleida
AMTortosa	Arxiu Municipal, Tortosa
ASAg	Archivio di Stato, L'Aquila
ASBo	Archivio di Stato, Bologna
ASCCittà di Castello	Archivio Storico Comunale, Città di Castello
ASCSansepolcro	Archivio Storico Comunale, Sansepolcro
ASFf	Archivio di Stato, Florence
ASMc	Archivio di Stato, Macerata
ASMi	Archivio di Stato, Milan
ASMo	Archivio di Stato, Modena
ASNa	Archivio di Stato, Naples
ASPe	Archivio di Stato, Piacenza
ASPd	Archivio di Stato, Padua
ASPg	Archivio di Stato, Perugia
ASPr	Archivio di Stato, Parma
ASPt	Archivio di Stato, Pistoia
ASTr	Archivio di Stato, Terni
ASVat	Archivio Segreto Vaticano
ASVe	Archivio di Stato, Venice
ASVr	Archivio di Stato, Verona
BAmbrosiana, Milan	Biblioteca Ambrosiana, Milan
BArcAlag	Biblioteca Arcivescovile Alagoniana, Syracuse
BAVat	Biblioteca Apostolica Vaticana
BBAngelico, Rome	Biblioteca "Beato Angelico", Rome
BCAPiceno	Biblioteca Comunale, Ascoli Piceno
BCABo	Biblioteca Comunale dell'Archiginnasio, Bologna
BCAriosteaFe	Biblioteca Comunale Ariostea, Ferrara
BCBertolianaVc	Biblioteca Civica Bertoliana, Vicenza
BCGamb, Rimini	Biblioteca Civica Gambalunga, Rimini
BClassenseRa	Biblioteca Classense, Ravenna
BCMalatestianaCesena	Biblioteca Comunale Malatestiana, Cesena
BCMn	Biblioteca Comunale, Mantua
BConvSFrancesco, Bologna	Biblioteca del Convento di S.Francesco, Bologna
BCPd	Biblioteca Civica, Padua
BCPerpignan	Bibliothèque Communale, Perpignan

BCSaffi, Forli	Biblioteca Comunale "Saffi", Forli
BCSansepolcro	Biblioteca Comunale, Sansepolcro
BCUd	Biblioteca Comunale, Udine
BCVercelli	Biblioteca Civica, Vercelli
BCVr	Biblioteca Civica, Verona
BEUMo	Biblioteca Estense e Universitaria, Modena
BFGCini, Venice	Biblioteca della Fondazione Giorgio Cini, Venice
BGiovVeroli	Biblioteca "Giovardiana", Veroli
BMCCorrer	Biblioteca del Museo Civico Correr, Venice
BMedLaur, Florence	Biblioteca Medicea Laurenziana, Florence
BMN, Subiaco	Biblioteca del Monumento Nazionale di Santa Scolastica, Subiaco
BMPanizzi, Reggio Emilia	Municipale "A. Panizzi", Reggio Emilia
BN, Naples	Biblioteca Nazionale, Naples
BNC, Florence	Biblioteca Nazionale Centrale, Florence
BNFrance	Bibliothèque Nationale de France
BNMarcianaVe	Biblioteca Nazionale Marciana, Venice
BPalatina, Parma	Biblioteca Palatina, Parma
BProvTommasi, L'Aquila	Biblioteca Provinciale "S. Tommasi", L'Aquila
BRiccMor, Florence	Biblioteca Riccardiana e Moreniana, Florence
Brit. Mus.	British Museum, London
BUBo	Biblioteca Universitaria, Bologna
JNULJerusalem	Jewish National and University Library, Jerusalem
NLMalta	National Library, Malta
ÖNB, Vienna	Österreichische Nationalbibliothek, Vienna

CC-CM	<i>Corpus Christianorum – Continuatio Mediaevalis</i>
CFHB	<i>Corpus fontium historiae Byzantinae</i>
CIG	<i>Corpus Inscriptionum Graecarum</i>
CSCO Arab.	<i>Corpus scriptorum Christianorum orientalium, Scriptores Arabici</i>
CSCO Syr.	<i>Corpus scriptorum Christianorum orientalium, Scriptores Syri</i>
CSHB	<i>Corpus scriptorum historiae Byzantinae</i>
DHV	Դիւան չայ վիմագրութեան, <i>Diwan Hay Vimagrut'yan</i>
FSI	<i>Fonti per la Storia d'Italia</i>
MGH, SRG	<i>Monumenta Germaniae Historica, Scriptores Rerum Germanicarum in usum scholarum separatim editi</i>
MGH, SRG, n.s.	<i>Monumenta Germaniae Historica, Scriptores Rerum Germanicarum, nova series</i>
MGH, SS	<i>Monumenta Germaniae Historica, Scriptores (in folio)</i>
ODB	<i>The Oxford Dictionary of Byzantium I-III, Oxford 1991</i>
PG	<i>Patrologiae cursus completus, series Graeca</i>
PL	<i>Patrologiae cursus completus, series Latina</i>
PLP	<i>Prosopographisches Lexikon der Palaiologenzeit</i>
PO	<i>Patrologia Orientalis</i>
RBMS	<i>Rerum Britannicarum Medii Aevi Scriptores</i>
RCEA	<i>Répertoire chronologique d'épigraphie arabe</i>
RHC-Occ.	<i>Recueil des Historiens des Croisades – Historiens Occidentaux</i>
RHGF	<i>Recueil des Historiens des Gaules et de la France</i>
RIS ¹	<i>Rerum Italicarum Scriptores, ed. L.A. Muratori</i>
RIS ²	<i>Rerum Italicarum Scriptores, new ed.</i>
TAVO	<i>Tübinger Atlas des Vorderen Orients</i>
TIB	<i>Tabula Imperii Byzantini</i>

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