

5.6. *Sixteenth-eighteenth centuries: a new «filter» for establishing seismic effects*

Archive research of the modern age has been able to explore a number of administrative situations, structured into offices and public authorities, which had interests in the building heritage, both urban and rural, from different angles. Among the documents of the financial and administrative sector, research has highlighted ways of intervening both at the damage evaluation stage and at the stage of the emergency and reconstruction which differed according to the institution. These «styles» were often dictated by a different jurisdictional conception of the same governed territory. Diplomatic and administrative correspondence was also examined.

As regards reconstruction, the old administrative policies after a destructive earthquake can be divided into three types:

1) Granting of tax exemptions and financial incentives for production and reconstruction, with various sums of money available at special rates, sums provided from the State coffers; this was the administrative tradition of the Grand Duchy of Tuscany, from the Medici to the Lorraine.

2) Granting of tax relief from one to ten years, to which were added alms handed out as «royal benevolence», of variable amount but usually small; repair of the public structures (ports, fortresses etc.). This was the policy of intervention of the Kingdom of Naples (with the exception of the reconstruction of 1783), the Spanish viceroyalty of Sicily (except for the reconstruction of 1693) and, in part, of the Venetian Republic.

3) Granting of tax relief and distribution of funds collected through a general lump sum taxation; this was the administrative policy of the Church State from the mid-eighteenth century; previously only tax relief had been granted.

It was not rare for the different financial and tax provisions to overlap on the same territory hit by the effects of a destructive earthquake. For this reason, very different rhythms of renewal were established, depending on the administrative solutions adopted. The differences also led to a different quality of reconstruction

(hasty, temporary or even only apparent, or more provident). The influence of this in Italy not only led to a different culture of the seismic disaster, but also resulted in different outcomes of the effects of subsequent earthquakes.

That sort of institutional paternalism that characterised the rule of the Grand Duchy of Tuscany, first under the Medici (Mannori, 1994) and then with the Lorraine, led to the development of a more enterprising spirit of reconstruction, with the practice of loans on special terms. This spirit was also of decisive importance in encouraging the establishment and commitment to renewal in the areas affected, which perhaps has no equal in the rest of the other old Italian states, though within the economic limits in which often this practice was applied (see in the CD-ROM the earthquakes of 1688 and 1781).

The mild reformism attempted by the State of the Church for reconstruction hinged on the exemption from some treasury duties and on the division of a fund collected from the taxes, and required rather long bureaucratic processing. The tax was distributed over the whole territory affected and did not come out of the state coffers, nor was it paid only by the wealthy classes. It was on the whole an inadequate fiscal practice, open to much unfairness, which did not solve the problems of reconstruction. What is more, it contributed to discouraging mainly the production and craftworker classes, who were often forced to migrate. Only in some special cases did the pontifical chamber undertake to support reconstruction, as it did for the earthquake in Benevento in 1688 (see in the CD-ROM), when considerable financial means were provided to support the local silk industry. Since the city was an enclave in the area of the Kingdom of Naples, a mass exodus of the craftsmen was feared and everything possible was done to re-establish the city.

The «earthquake tax» policy of the Venetian Republic was very similar. Tax exemptions were not followed by incentives; the funds provided by the State were spent on repairing structures which enabled traffic, trade and defence, meaning ports, bridges and fortresses (see for example, in the CD-ROM, the earthquakes of 1695 and 1743). Between the centralised Venetian

administration and the various representatives of state power in the area, there was an intermediate level. The various regiments into which the Venetian territory was divided were gathered into provinces, at the head of which were the Lieutenants or general superintendents, who had viceroial power. The correspondence between these and the Podesta, representatives of the State power in the smaller towns, the Superintendents and Captains, in the fortified towns, and the Rectors, in certain more strategic regiments, clearly outline the Venetian policy of intervention after a destructive earthquake. In cases of particular emergency, the Senate of the republic could appoint a general superintendent with full powers and *Sindaci* (or Inquisitors) to check their work or examine the administration of the regiments in general. Thus, different authorities and roles could overlap the normal bureaucratic apparatus. For the *da Mar* dominions (see the case of the earthquake of 1743, for example in the CD-ROM) it was the general Superintendent *da Mar*, with headquarters on Corfù, who had direct rule of the dominions of the Ionian islands and who made decisions with full powers delegated by the Senate.

Also for the Bourbon kingdom the exemption from treasury duties was practically the only instrument applied. *The Camera della Sommaria*, a magistrature with its different offices (*Ruote, Consultationes, Notamentorum, Collaterale, Curia*) formed the great administrative «filter» which collected the procedures for exemption requested by the universities (local communities) and by the feudal lords for all the destructive earthquakes of the kingdom (petitions, investigations, declarations, concessions, processes, etc.). This is valuable documentation, unfortunately not free of omissions and loss, but fundamental for the knowledge of the seismic effects of most of Central Italy and the whole of Southern Italy.

In some periods of history great seismic disasters have also given rise to exceptional provisions: these very special cases include provisions for reconstruction after the earthquakes of Eastern Sicily in 1693 and after the Calabrian earthquakes of February-March 1783. These are very well-known events, among the very few which have attracted the attention of historians

and for which full analysis has been made of the decisional economic and political processes behind the projects of reconstruction. As is known, after the 1693 earthquake, entire villages in Sicily were reconstructed and thus Sicilian towns took on a Baroque appearance (we may recall the detailed studies of Santi Luigi Agnello and Liliane Dufour).

As regards the earthquakes of Calabria, a restructuring was attempted of the landed property based on baronial and ecclesiastic properties, in order to collect the funds for the reconstruction of villages and towns. This was an enlightened project but was not carried out in full and remained to influence the life of the Calabrian communities for generations. These two famous reconstructions have produced a remarkable quantity of administrative and fiscal documentation (see the relative bibliographies, in the CD-ROM), creating problems for our research as regards the choice and importance of the documents to use.

From the sixteenth century, the economic, bureaucratic and political development of the Italian States became quite complex and in line with the general context. Diplomatic activity thus became one of the mainstays of the political and commercial strategies between States, whether they were duchies, grand duchies, kingdoms or republics. For this reason, diplomatic correspondence constitutes another important source of information for finding out about seismic scenarios and reconstruction. The ambassadors, with their secretariats, resided at the court of the State to which they were delegated, generally for several years, and became expert informers and careful observers. Some examples of how this type of source has been used in our research may be found for the earthquakes of 1570, 1638 and 1694 (all in the CD-ROM). For the event of 1570 in Ferrara, the correspondence of the ambassadors of the Grand Duchy of Tuscany (Bernardo Canigiani) and the duchy of Urbino (Livio Passeri) left an outstanding series of letters with detailed descriptions not only of the damage to the city, but also of the difficulties in reconstruction from the point of view of economy and political image. For the events of 1638 in Calabria and 1694 in Irpinia, the ambassadors of the Church State (Archive of the Nunci-

atures), fulfilling diplomatic functions at the court of Naples, were used as sources. Their almost daily correspondence collected direct information, with numerous descriptive elements relative to the succession of aftershocks. The ambassadors of foreign courts residing at Italian courts also left papers and information of considerable interest about earthquakes, today preserved in the archives of European states.

The use of some quantitative elements of the sources has resulted in a considerable improvement in quality in gaining information on the seismic scenarios of these centuries. The contribution of the sources was found to be decisive for the increase in archive information on local seismic scenarios. The administrative and fiscal sources of the State Archive in Naples, particularly the documents of the *Regia Camera della Sommatoria* – to mention just one of the great offices of the kingdom responsible for administrative and fiscal matters concerning post-earthquake management – have made a remarkable contribution to the knowledge of the seismic scenarios of Central-Southern Italy. There are more than 300 documents filed and used, regarding the *Camera della Sommatoria* alone, for earthquakes occurring in the seventeenth and eighteenth centuries. We should remember that many of these deeds consist of lengthy reports, containing outlines of territorial effects in a number of villages. Besides these, there are the numerous procedures produced by other offices and magistracies, such as the *Camera di Santa Chiara*, the *Cappellania Maggiore*, and the *Suprema Giunta di Corrispondenza di Cassa Sacra*.

Since the seventeenth century systematic selections have also been made of gazettes and newspapers. In these centuries such sources constituted an important sector of filed bibliography. As a precautionary measure, the code Fi has been attributed to this type of source to distinguish its contribution from that of the institutional and memorialist sources of the time. While on the one hand this classification may be considered restrictive, on the other it has revealed that correspondence and services did not always relate directly to the events, since they could be picked up and copied and sometimes even altered quite arbitrarily.

5.7. Nineteenth century: bureaucratic and administrative innovations

The regulations of Napoleonic Italy (1799-1815), though in force for a brief period, brought about a number of variations as regards territorial administrative concerns, with new offices and authorities for the administrative handling of the territory. New consultative bodies were created on a central (State council) and peripheral level (communal and provincial councils) and more importantly the foundations for a new bureaucracy were laid. The most interesting aspect as regards our research was the close hierarchical relations formed between offices and subject to rigid control. Each central office had a local division of its own, parallel to that of other offices. While in the previous systems the various magistracies, offices and authorities moved as separate bodies, sometimes even with different administrative logic, the new bureaucratic structure, which permeated the subsequent modern bureaucracy, was divided into Ministries and dependent offices. On a local level, while initially characterised by a variety of different powers, the territories were structured into communes or provinces, all with the same parallel systems. The study of the earthquakes of this period was facilitated by this new system, in which it is easier to identify the administrative links and the decisional levels. From the Restoration to the Unification (1815-1860) the previous heritage was not completely destroyed, though it remained in the numerous variations of the various restored states.

The sources relating to the earthquakes of this period show the administrators' great preoccupation with problems of public order: see, for example, in the CD-ROM the earthquake in the Duchy of Modena in 1832, amidst a climate of heated ideological tension and police repression which even made an instrument of the seismic effects. For example: the reconstruction after the earthquake in Basilicata of 1857 lacked planning and incentives, triggering a period of economic deterioration and further decay in the quality of housing. However, from the point of view of damage evaluation, the stable administrative structures formed by the *Intendenze*, concerned with the various parts of the territory of

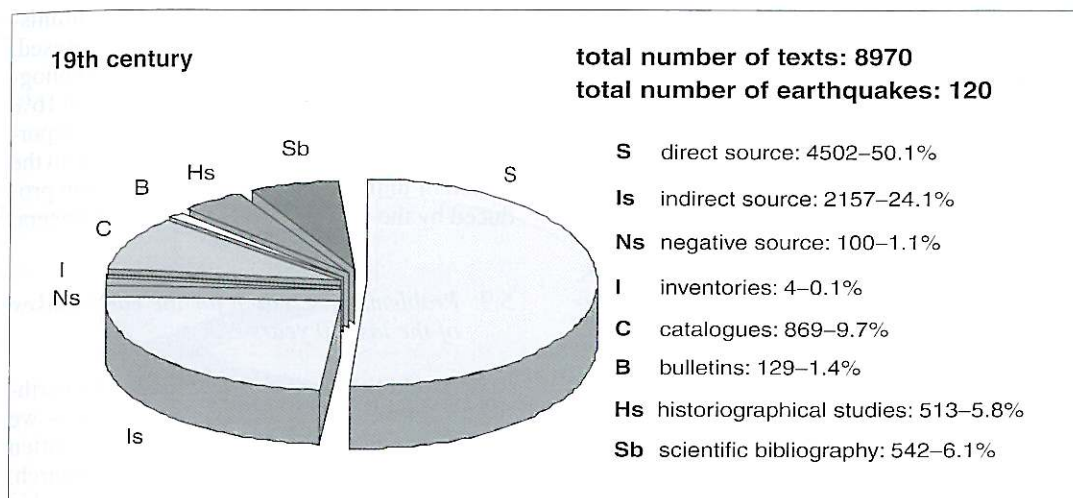


Fig. 9. Classification of the general bibliography of CFTI3 on the basis of information given in the text, for the 19th century earthquakes.

the kingdom of Naples, functioned with a certain degree of efficiency. The fact that we have a fairly detailed picture of the effects is due to this source of control of the territory, which gave rise to the instructions and evaluations for financial interventions, equivalent to those of the Prefects of the post-unification period. The tentative experiences of the communal councils and the building commissions, which after the huge disaster of 1857 in Basilicata had tried to draw up new regulations for construction in the destroyed areas, were completely abandoned as the power passed from the Bourbon State to the new Kingdom of Italy (for an overall assessment of the databases for the 19th century, see fig. 9).

5.8. *The Kingdom of Italy (from 1860 to 1948)*

With the reform of 1872, archive structuring changed radically, creating the first real break in Italian documentation (D'Addario, 1975). The archive categories were standardised within a single administrative structure and the offices were oriented towards specific responsibilities: modern bureaucracy in general was initiated. Ar-

chive research in relation to seismic events may seem, from this date, oriented towards a sort of «normalisation» of pathways. This is true only in theory: as we have seen, losses, overlaps or fragmentation of papers or, on the contrary, excess documentation, have sometimes created problems of a new type concerning the good quality and quantity of knowledge of the effects and the economic costs of a great seismic event.

Recentralised administration continued to operate in communes and provinces and the most important point of hierarchical convergence was usually the provincial capitals (now the headquarters of State archives). Public administration became widespread and evenly located. The Prefect became the holder of decision-making State power. It is in fact in the archives of prefecture and in those of their territorial divisions, the sub-prefecture, that the most interesting papers are preserved as regards the knowledge of a seismic disaster in the post-unification period. Commissions, committees and sub-committees then formed a network of reciprocal checks, the decisions of the various organs of the State and their interaction with the local administrations.

The historical archives of the various Ministries, from 1872, constitute a history in them-

selves (the Central State Archive). The administrative-bureaucratic division between the summit of the State (Ministries), prefects, sub-prefects and mayors forms the general structure of the basic data, which has been used to find out about the frameworks of effects of the major earthquakes of this period, outlined by public institutional sources.

This period saw the start of the systematic production of the archives by civil engineers. Measuring the damage immediately after a destructive earthquake (and sometimes performed also by the Military Engineers) then acquired primary importance. This expertise and measurements became the criteria according to which the funds of the national community were dated out to boost reconstruction. These were rather complicated technical/administrative processes, often fragmented into a thousand minor procedures, difficult to reconstruct also because these archive sectors closer to us are rarely the subject of specific studies from the point of view of the history of administration. The various archive situations have been clarified and the possible solutions have thus been found during the research process itself, sometimes with the aid of helpful archivists, who deserve our warm gratitude.

The earthquake of Messina of 1908 marks an important moment in the handling of the reconstruction. After this event considerable economic resources from the entire national community began to be channelled to the areas destroyed and reconstruction became a way to increase local economic processes with public funds. It was in fact these large bureaucratic processes, which went on for generations, leading to the fragmentation of the administrative practices, rather difficult to reconstruct today.

For this period too, ecclesiastic sources have been used in the same systematic manner as the previous periods, with the aim of continuing observation of a building type – the church – which was fairly stable over time (see, for example, the extensive documentary supplements supplied by church sources for the earthquake of Avezzano in 1915, in the CD-ROM).

The contribution of the institutional and administrative sources has been considerable, for the particular aspects of these testimonies, from the point of view of their production and the

quality of the information. Besides the administrative sources, scientific sources have been used, with catalogues, bulletins and scientific bibliography also being used and representing about 16% of the information used. Of particular importance for the description of the damage, from the period of unification, is the documentation produced by the various offices of Civil Engineers.

5.9. Problems of research for the earthquakes of the last 50 years

It would be wrong to suppose that the earthquakes closest to us in time are the ones we know most about. On the contrary, they often pose new and different problems for research. For a number of events, located and evaluated in the PFG catalogue (Postpischl, 1985) on an instrumental basis, the local pictures of the effects are unknown. The intensity is inferred from standard formulae of attenuation and is hardly ever reflected in the macroseismic picture. Indeed, various events, estimated on the basis of the instrumental magnitude as destructive as regards the effects, were found on analysis to be without macroseismic effects (see for example, in the CD-ROM, the cases of the earthquakes of 1947 and 1954).

Not only are many archives of the Civil Engineers more difficult to consult or lost, but the new decentralised administrative bureaucracies, especially since the Fifties, seem to be fragmented into an infinite number of documents, beginning, we could say, «bottom-up» (requests for grants, requests for survey, declarations of states of need, etc.). Sometimes it is the technical baricentre which seems to be missing, buried beneath a large number of figures which are not easy to pinpoint from the administrative point of view. Even the documentation of the relative centralised administrations (particularly Ministries) are frequently very difficult to consult due to the lack of inventories or the relocation of papers to departments not open to consultation, etc.

Thus, new difficulties emerge from the apparent homogeneity of the archive series, which would instead seem to favour systematic and accurate research. Once more we may observe that

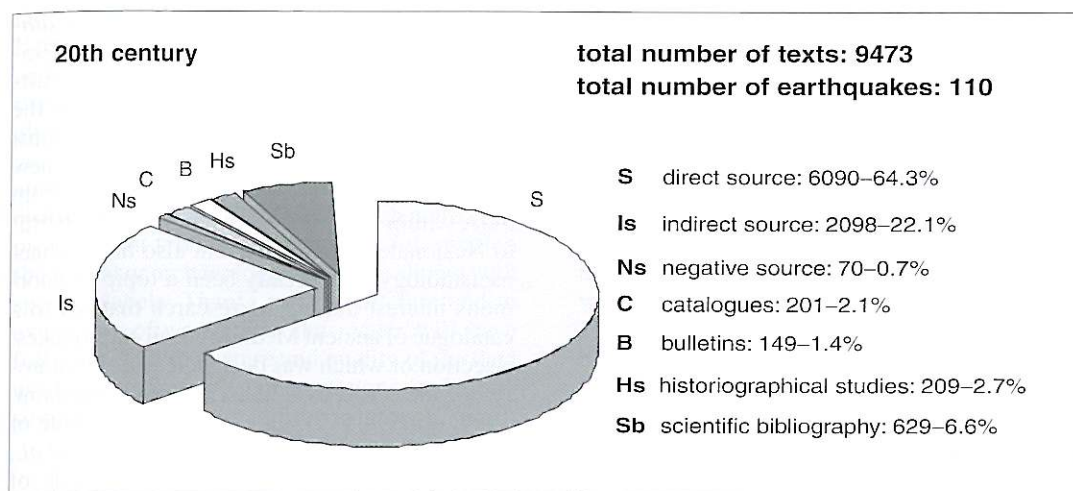


Fig. 10. Classification of the texts of CFTI3 on the basis of information given for the 20th century earthquakes.

the chance to use the information is not directly related to the closeness in time of the events, nor to the potential sources (fig. 10).

6. Construction of the database: filing and archiving

The filing of the historical data collected represented a very important aspect of the organisation of the research and of the processing of the results. When we began to file the data of historical seismology in a database in 1983, computer processing was not as developed as it is today. The initial database, the fruit of the research so far carried out on the basis of the technological means available, has obviously over the years undergone variations and additions. The necessary transformations have, however, maintained the initial logic of the computer information links between the various parts of the database. It should be said, in praise of those who have followed this aspect through the years, that none of the material filed has ever been lost and the changeovers to different technologies have been made without rendering any part of the memoirs obsolete.

The database has become increasingly ductile and dynamic, able to fulfil the needs both of a systematic archiving of the texts and their classification according to the value of the information used, and of the automatic printing of the general bibliography or by single event, according to different sorting criteria.

The researchers' increasing skill in using computer technology has made it possible to store the historical data directly at the research centres (archives and libraries), relieving the researchers of the burden of writing by hand on paper files adopted for the first four years. Indeed, from 1983 to 1986 paper files were memorised at the co-ordination centres; since 1987 the researchers have taken an active part – not without initial problems in learning to use the computer technology – in creating the database, actively participating even during the classification of the information.

At the moment the fields included in the database allow for constant and critical updating of the various texts, as analysis and research proceed. Because of the huge variety of sources and texts analysed – ancient literature, medieval annals, archive documentation, newspapers, scientific reports, etc. – it has been necessary to

balance the elements to be included in the filing so as to enable efficient and thorough management without making the file complicated to handle. On the whole, filing was done dynamically, allowing for the constant updating of the database and constant control also of the quality of any new entries; the archiving is based on a computer system with three files named A, B, and A1 (see Appendix 2).

7. Logical structure of the data for consulting the catalogue

The variety and complexity of the historical data was such that it is almost impossible to reduce them to the seismological queries alone. To facilitate access to the information and also to prevent dispersal of data not directly used for the description of the effects, though useful for evaluating the seismic scenarios from different points of view, we decided to structure the results into brief comments. Eight broadly-based areas were identified, from which another 14 sub-areas of information may be derived, according to the level and detail of the knowledge.

The nine broadly-based areas are:

- Information available in previous catalogues
- State of earthquake review
- Major earthquake effects
- Earthquake social context
- Effects on the environment
- Location and nature of the observed effects on the environment
- Main features of the earthquake sequence
- Memorised original texts
- Classified bibliography.

8. Beyond written sources: the contribution of archaeology

This synthetic presentation of the typology of sources and of their respective cultural and historical contexts would not be complete without a brief mention of the contribution of archaeology and its role in the drafting of our catalogue. The archaeological sources are indeed characterised by well-established issues and by a vast specific literature. Nevertheless,

during the course of publication of the *Catalogue of Strong Italian Earthquakes* (1995-2000), we have decided to separate the results of research in historical seismology from the results arising from archaeoseismology. We must recall that during the past six years this new discipline has received special attention from SGA within the research programs of the Istituto Nazionale di Geofisica, but also that archaeoseismology had already been a topic of enormous interest during the research that led to a catalogue of ancient Mediterranean earthquakes, a section of which was designed as a «laboratory» of ideas and case histories (see Guidoboni, 1989, pp. 398-517). Later on a special issue of the *Annali di Geofisica* (edited by Boschi *et al.*, 1995b) discussed problems and methods of archaeoseismology within a specific section (pp. 881-1019).

The goal of the research completed so far has been to outline a work methodology and test specific seismological questions arising from notable archaeological contexts (Guidoboni, 1996, 2000). Some of the most important results have already been published, others are in the process of publication. For example, the area of the Messina Straits was investigated to gather new evidence on the recurrence interval of events similar to the 28 December 1908 earthquake ($M \sim 7.2$) (Guidoboni *et al.*, 2000); the area of Selinunte (Southwestern Sicily) was studied to constrain the causes and timing of the collapse of ancient temples; the Central Apennines were scrutinized in search of the traces of large earthquakes unknown to current catalogues. The work already completed concerned highly diverse historical epochs from the 5th century B.C. to the 12th century A.D., each one characterised by specific research problems in the vast scenario that goes from ancient to medieval archaeology.

We are now at the end of this initial and rather «experimental» stage of research in archaeoseismology, that is roughly coeval with the development of the *Catalogue of Strong Italian Earthquakes*. The results and the methodologies behind them have been substantiated enough that we can confidently plan to include the new findings in future issues of the catalogue (a special issue dedicated exclusively to

the «unknown earthquakes» is announced by Enzo Boschi in the presentation to this volume), and more research is already under way. The particular structure of the present database will allow all research issues, both historical and archaeological, to be fully outlined and debated along with problems of data reliability and decisions on the most effective research paths. The predominant typology of the basic information (historical or archaeological) will be shown with specific labels. Thanks to this structure and to extensive software links, the reader will have full control on the nature and quality of the data used to support the interpretations and decisions by the compilers of the catalogue.

9. Towards a new earthquake culture?

The particular nature of the Italian «case» has demanded, as we have seen, broad and detailed basic research, the results of which form this new catalogue. It should at this point come

as no surprise to the user that the research has had to lend so much importance to the economic and social aspects concurrent with the earthquakes, striving for accuracy from the archival and philological research, and attempting to extend the data of the effects over as wide an area as possible. All this has helped to improve quality, to make the data more suitable for evaluating the epicentral areas and therefore for estimating the magnitude. This has been achieved with the work of many years' research and processing. The resulting high data quality has been favoured by an extraordinary variety of local cultures, different administrative customs, the analysis of economic levels which in time have influenced the historical definition of the effects of the earthquakes and the preservation of the traces. Earthquakes may be interpreted and better understood only within their specific historical contexts: only from proper historical research with a specific aim is it possible to gain the numerical processing and parameters which may be used for more accurate estimations of hazard.

Appendix 1. Main catalogues of earthquakes in Italy, or regarding Italy, from ancient times to 1994. [] manuscripts * only parametric

-
- | | |
|-----------|---|
| [1457] | Manetti Giannozzo , <i>De terraemotu libri tres</i> , Biblioteca Apostolica Vaticana, cod. Urbinat. lat. 5, cc. 161r-215v;
(Italian translation by C. Scopelliti, notes by C. Scopelliti and D. Molin, ENEA, Roma 1983). |
| 1571 | Buoni I.A. , <i>Del terremoto, dialogo di I.A. Buoni medico ferrarese distinto in quattro giornate</i> , Ferrara. |
| [1574-77] | Ligorio Pirro , <i>Libro o trattato de diversi terremoti, raccolti da diversi autori, per Pyrro Ligorio cittadino romano, mentre la città di Ferrara è stata percossa et ha tremato per un simile accidente del moto della terra</i> , Archivio di Stato di Torino, Antichità Romane, vol. 28. |
| 1578 | Ragor I.H. , <i>Von den Erdbidem ein grundlicher Bericht</i> , Basilea. |
| [1563-80] | Pacca Colanello , <i>Discorso del terremoto</i> , Biblioteca della Società Napoletana di Storia Patria di Napoli, Fondo sismico, ms. 71A3. |
| 1652 | Filippo da Secinara , <i>Trattato universale di tutti li terremoti occorsi e noti nel mondo con li casi infauti ed infelici pressagiti da tali terremoti</i> , Aquila. |
| 1688 | Magnati V. , <i>Notitie istoriche de' terremoti succeduti ne' secoli trascorsi e nel presente indirizzate alla Serenissima Real Maestà di Carlo II</i> , Napoli. |
| 1691 | Bonito M. , <i>Terra tremante, o vero continuatione de' terremoti dalla Creatione del Mondo sino al tempo presente...</i> , Napoli. |
| 1703 | Abbati B. , <i>Epitome metheorologica de' tremoti, con la cronologia di tutti quelli, che sono occorsi in Roma dalla creazione del mondo sino agl'ultimi successi sotto il pontificato del regnante Pontefice Clemente XI...</i> , Roma. |

- 1743 **Mongitore A.**, Istoria cronologica de' terremoti di Sicilia, in *Della Sicilia ricercata nelle cose più memorabili*, tome 2, pp. 345-445, Palermo.
- 1756 **Seyfart J.F.**, *Algemeine Geschichte der Erdbeben*, Frankfurt-Leipzig.
- 1757 **Bertrand M.E.**, *Memoires historiques et physiques sur les tremblements de terre*, La Haye.
- 1781 **Toaldo G.**, Catalogo dei terremoti sentiti in Padova, in *Della vera influenza degli astri sulle stagioni e mutazioni di tempo. Saggio meteorologico*, 2a ed., Padova.
- 1783 **Vivenzio G.**, Istoria e teoria de' tremuoti in generale ed in particolare di quelli della Calabria, e di Messina nel MDCCCLXXXIII, Napoli, part I, pp. I-CLIV, 2a ed. 1788.
- 1798 **Soldani A.**, Terremoti, che in diversi tempi hanno travagliato la Città di Siena, in *Relazione del terremoto accaduto in Siena il dì 26. maggio 1798. divisa in sei lettere*, Siena, pp. 52-66.
- 1809 **Galeani Napione G.**, Ricerche storiche intorno agli antichi terremoti del Piemonte, *Memorie dell'Accademia delle Scienze di Torino*, 1809.
- 1837 **Pilla L.**, Relazione de' tremuoti che afflissero la città di S. Germano ed il monastero di Montecassino nella primavera del corrente anno 1837, *Annali Civili del Regno delle due Sicilie* 14 (28), pp. 99-105.
- 1840-41 **Hoff K.E.A. von**, Chronik der Erdbeben und Vulcanausbrüche, erster Theil vom Jahre 3460 vor bis 1759 unserer Zeitrechnung; zweiter Theil vom Jahre 1760 bis 1805, und von 1821 bis 1832 n. Chr. geb., in *Geschichte der durch Überlieferung nachgewiesenen natürlichen Veränderungen der Erdoberfläche*, Theil 4, 5, Gotha.
- 1843 **Arcovito S.**, Memoria de' fenomeni meteorologici, che ebbero luogo in Reggio nel corso dell'anno 1841, con un'appendice de' tremuoti, *Atti della Società Economica della Prima Calabria Ulteriore* 3 (5), pp. 17-37.
- 1846 **Pilla L.**, Principali tremuoti avvenuti in tempi storici in Toscana, in *Istoria del tremuoto che ha devastato i paesi della costa toscana il dì 14 agosto 1846*, Pisa 1846, pp. 195-217.
- 1848 **Perrey A.**, Mémoire sur les tremblements de terre de la péninsule italique. *Mémoires Couronnés et Mémoires des Savants Étrangers de l'Académie Royale de Belgique*, tome 22 (1846-47).
- 1852-54 **Mallet R.**, Catalogue of recorded earthquakes from 1606 B.C. to A.D. 1850, *Report of the twenty-second meeting of the British Association for the Advancement of Science*.
- 1861 **Capocci E.**, Catalogo de' tremuoti avvenuti nella parte continentale del Regno delle Due Sicilie posti in raffronto con le eruzioni vulcaniche ed altri fenomeni cosmici, tellurici e meteorici, *Atti del Reale Istituto d'Incoraggiamento alle Scienze Naturali di Napoli* 9, pp. 337-378, Napoli.
- 1880 **Goiran A.**, Storia sismica della provincia di Verona, Verona.
- 1880 **Guarini F.**, I terremoti a Forlì in varie epoche, Forlì.
- 1880 **Reginus**, Notizie di terremoti sentiti in Reggio dall'anno 1223 in avanti, *Il Crostolo almanacco istoriografico reggiano per l'anno 1880*.
- 1881 **Mercalli G.**, I terremoti dell'isola d'Ischia, *Atti della Società Italiana di Scienze Naturali*, 24.
- 1881 **Schmidt J.F.J.**, Studien über Vulkane und Erdbeben. II. Abtheilung. Studien über Erdbeben, 2a ed., Leipzig.
- 1882 **Dei A.**, I terremoti avvenuti in Siena dall'anno 1294 al 12 agosto 1882, *Bollettino mensile dell'Osservatorio centrale del R. Collegio Carlo Alberto in Moncalieri*, s. II, 2, p. 199.
- 1883 **Mercalli G.**, *Vulcani e fenomeni vulcanici in Italia*, Milano.
- 1883 **Nissen H.**, *Italische Landeskunde. I Land und Leute*, Berlin.
- 1884 **Carbone Griio D.**, I terremoti di Calabria e di Sicilia nel secolo XVIII, Napoli.
- 1888 **Piovene G.**, Cronaca dei terremoti a Vicenza, *Annali dell'Ufficio Centrale Meteorologico e Geodinamico Italiano*, s. II, 8 (1886), part 4, pp. 45-57.
- 1888 **Tommasi A.**, I terremoti nel Friuli dal 1116 al 1887, *Annali dell'Ufficio Centrale Meteorologico e Geodinamico Italiano*, s. II, 8 (1886), part 4, pp. 183-205.

- 1889 **De Rossi M.S.**, Documenti raccolti dal defunto Conte Antonio Malvasia per la storia dei terremoti ed eruzioni vulcaniche massime d'Italia, *Memorie della Pontificia Accademia dei Nuovi Lincei* 5, pp. 169-289.
- 1892 **Baratta M.**, Catalogo dei principali fenomeni sismici avvenuti a Roma, in «Il terremoto laziale del 22 gennaio 1892», *Bollettino della Società Geologica Italiana* 11, pp. 38-41.
- 1895 **Agnelli G.**, I terremoti registrati nelle cronache lodigiane, *Archivio storico per la città e comuni del circondario di Lodi*, s. II, 14, pp. 90-96.
- [1895] **Crivellari G.**, *I terremoti a Bassano (1348-1894). Notizie e memorie estratte da storie e cronache locali*, ms. 1895, Biblioteca Civica di Bassano del Grappa, Manoscritti, 30-C-2-13.
- 1895 **Giovannozzi G.**, Per una storia dei terremoti toscani, *La Rassegna Nazionale* 83, pp. 222-239.
- 1895 **Giovannozzi G.**, I terremoti storici fiorentini, *La Rassegna Nazionale* 84, pp. 122-131.
- 1895 **Giovannozzi G.**, I terremoti storici mugellani, *Le serate italiane* 2 (15), 4 agosto 1895.
- 1895 **Giovannozzi G.**, I terremoti storici apuani, *Le serate italiane* 2 (21), 3 novembre 1895.
- 1895 *Notizie dei terremoti avvenuti in Cesena e luoghi limitrofi*, Biblioteca Comunale «Malatestiana» di Cesena, ms. XXXI, 23.
- 1896 **Chistoni C.**, Notizie sui terremoti avvertiti a Modena dal 1830 al 1895 ricavate dal registro del Real Osservatorio, *Memorie della Regia Accademia di Scienze Lettere ed Arti di Modena*, s. II, 12.
- 1896 **Taramelli T. and Corradi P.F.**, Dei terremoti di Spoleto nell'anno 1895, con catalogo dei terremoti storici nella Valle Umbra, *Atti della R. Accademia dei Lincei. Classe di scienze matematiche fisiche e naturali*, s. V, 2, pp. 143-181.
- 1897 **De Rossi M.S.**, I terremoti nella città di Roma, *Bollettino del vulcanismo italiano* 18-20, pp. 9-21.
- 1897 **Baratta M.**, Materiali per un catalogo dei fenomeni sismici avvenuti in Italia 1800-1872, *Memorie della Società Geografica Italiana* 7, pp. 81-164.
- 1897 **Mercalli G.**, I terremoti della Calabria meridionale e del messinese, *Memorie della Società Italiana delle Scienze (detta dei XL)*, s. III, 11, pp. 117-266.
- 1897 **Mercalli G.**, *I terremoti della Liguria e del Piemonte*, Napoli.
- 1898 **De Giorgi C.**, Ricerche sui terremoti avvenuti in Terra d'Otranto dall'XI al secolo XIX, *Memorie della Pontificia Accademia dei Nuovi Lincei* 15, pp. 95-154.
- 1899 **Baratta M.**, I terremoti del Lazio, *Rivista Marittima* 32, pp. 249-257.
- 1899 **Baratta M.**, Saggio dei materiali per una storia dei fenomeni sismici avvenuti in Italia, raccolti dal Prof. Michele Stefano de Rossi, scelti ordinati e pubblicati da M. Baratta, *Bollettino della Società Geologica Italiana* 18, pp. 432-460.
- 1899 **Benassi P.**, *Materiali per la storia dei fenomeni sismici della regione parmense*, Parma.
- 1901 **Baratta M.**, *I terremoti d'Italia. Saggio di storia, geografia e bibliografia sismica italiana*, Torino.
- 1902 **Schorn J.**, Die Erdbeben von Tirol und Vorarlberg, *Zeitschrift des Ferdinandeums für Tirol und Vorarlberg*, pp. 99-282.
- 1906 **Galli L.**, *I terremoti nel Lazio*, Velletri.
- 1908 **Bettoni P.**, Cronistoria sismica della regione benacense, *Commentari dell'Ateneo di Brescia per l'anno 1908*.
- 1912 **Milne J.**, Catalogue of destructive earthquakes, *Report of the Eighty-first meeting of the British Association for the Advancement of Science*, Portsmouth 31 August-7 September 1911, pp. 649-740.
- 1915 **Costantini B.**, I terremoti d'Abruzzo, *Rivista Abruzzese di Scienze, Lettere ed Arti* (30 giugno 1915), pp. 281-295.
- 1915 **Guidi P.**, *I terremoti lucchesi anni 1112-1915*, Lucca.
- 1916 **De Giorgi C.**, Ricerche sui terremoti avvenuti in Terra d'Otranto dal 1898 al 1915, *Memorie della Pontificia Accademia Romana dei Nuovi Lincei*, s. II, 2, pp. 33-50.

- 1927 **Vari V.**, *I terremoti di Benevento e loro cause*, Benevento.
- 1931 **Cavasino A.**, Catalogo dei terremoti disastrosi avvertiti nel bacino del Mediterraneo dal 1501 al 1929, *Pubblicazioni della Commissione Italiana di studio per i problemi del soccorso alle popolazioni*, 2, pp. 25-60, Roma.
- 1932 **Sieberg A.**, Untersuchungen über Erdbeben und Bruchschollenbau im östlichen Mittelmeergebiet, *Denkschriften der medizinisch-naturwissenschaftlichen Gesellschaft zu Jena* 18, pp. 161-273.
- 1935 **Cavasino A.**, I terremoti d'Italia nel trentacinquennio 1899-1933, *Memorie del Regio Ufficio Centrale di Meteorologia e Geofisica*, s. III, Appendix to vol. 4.
- 1935 **Imbò G.**, I terremoti etnei, *Pubblicazioni della Commissione Italiana di Studio per i Problemi del Soccorso alle Popolazioni*, vol. 5, part 1, Roma.
- 1936 **Baratta M.**, I terremoti in Italia, *Pubblicazioni della «Commissione Italiana di Studio per i Problemi del Soccorso alle Popolazioni»*, vol. 6, Roma.
- 1937 **Zanon F.S.**, Storia sismica della provincia di Venezia, *Annuario dell'Osservatorio geofisico del seminario patriarcale di Venezia*, s. II, 10, pp. 53-89.
- 1942 **Caloi P.**, Attività sismica in Italia nel decennio 1930-1939, *Pubblicazioni della Commissione Italiana di Studio per i Problemi del Soccorso alle Popolazioni*, 9, Roma.
- 1968-71 **Kárník V.**, *Seismicity of the European Area*, 2 vols., Dordrecht.
- 1973 * **Carrozzo M.T., De Visintini G., Giorgetti F. and Iaccarino E.**, *General Catalogue of Italian Earthquakes*, Comitato Nazionale Energia Nucleare, Rt/prot (73) 12, Roma.
- 1974 * **Shebalin N.V., Kárník V. and Hadžievski D.**, *Catalogue of Earthquakes. Part I, 1901-1970. Part II, prior to 1901*, Skopje.
- 1975 * **Carrozzo M.T., Cosentino M., Ferlito A., Giorgetti F., Patanè G. and Riuscetti M.**, *Earthquakes catalogue of Calabria and Sicily (1783-1973)*, CNR, Quaderni de «La Ricerca Scientifica» 93.
- 1976 **Mahlknecht B.**, Kleine südtiroler Erdbeben Chronik, *Der Schlern. Zeitschrift für südtiroler Landeskunde* 50 (10).
- 1977 * **Bernardis G., Giorgetti F., Nieto D. and Slejko D.**, *Earthquakes Catalogue for Eastern Alps Region*, Trieste.
- 1978 **Iaccarino E. and Molin D.**, *Raccolta di notizie macrosismiche dell'Italia Nordorientale dall'anno 0 all'aprile 1976*, Comitato Nazionale Energia Nucleare, rt/disp (78) 7, Roma.
- 1979 * **ENEL**, *Catalogo dei terremoti avvenuti in Italia dal 1000 al 1975*, a cura di Aquater, file.
- 1980 **Dell'Olio A. and Molin D.**, *Catalogo macrosismico del Lazio dall'anno 1000 al 1975*, ENEA CRE Casaccia, AMB-MON, C.P. N. 2400, Roma.
- 1982 * **Istituto Nazionale di Geofisica**, *Catalogo dei terremoti italiani dal 1450 a.C. al 1800*, Open File.
- 1982 **Cortemiglia G.C.**, Manifestazioni sismiche recenti nel tortonese, *Julia Dertona*, s. II, 29 (61), pp. 5-22.
- 1982 **Ribarič V.**, *Seismicity of Slovenia*, Catalogue of earthquakes (792 A.D.-1981), Ljubljana.
- 1985 **Postpischl D.** (Editor) 1985, Atlas of isoseismal maps of Italian earthquakes, *Quaderni de «La Ricerca Scientifica»*, CNR-PFG, n. 114, vol. 2A, Roma.
- 1985 * **Postpischl D.** (Editor) 1985, Catalogo dei terremoti italiani dall'anno 1000 al 1980, *Quaderni de «La Ricerca Scientifica»*, CNR-PFG, n. 114, vol. 2B, Roma.
- 1989 **Guidoboni E.** (ed.), *I terremoti prima del Mille in Italia e nell'area mediterranea*, ING-SGA, Bologna.
- 1990 **Alexandre P.**, *Les séismes en Europe occidentale de 394 à 1259. Nouveau catalogue critique*, Brussels.
- 1993 * **Peronaci F.**, *Elenco cronologico dei terremoti verificatisi nel territorio nazionale dal 1700 al 1993*, Ministero dei Lavori Pubblici, Roma, file.
- 1994 **Guidoboni E., Comastri A. and Traina G.**, *Catalogue of ancient earthquakes in the Mediterranean area up to the 10th century*, ING-SGA, Bologna.

Appendix 2.

File A

This file provides elements concerning both the execution of the research and the results. It includes 4 key elements:

1. *Elements for identification of the researcher* – A code, *codbib*, makes recognition of the researcher and his research automatic. The code consists of six numerical fields: the first two identify the name of the researcher, the second four the progressive number of the files compiled by that researcher. The database does not accept two identical bibliographic codes. This element of recognition makes it possible to reconstruct the research paths, archivist or bibliographical, of individual researchers or workgroups, even many years later.

2. *Elements for text recognition* – These elements include:

- a) Author: geographic and chronological reference, role.
- b) Title of the work or brief registration of the document.
- c) Location: archive, library.
- d) Position: location of the text, reference to the number of the original microfilm preserved at the co-ordination centre.
- e) Critical notes to the text: editions, studies on the author, missing information, or other elements of evaluation indispensable for using the filed text.

3. *Chronological list of all the seismic events mentioned in the text, with reference to the pages, etc.*

4. *Classification of the filed information* – This classification is done in relation to the single seismic events mentioned. This is done using the code «*val*» (value). It is conceptually important to point out that it is not the work in itself that is classified, but the single item of information. In fact, even a prestigious work may contain information of little value concerning seismic events geographically or temporally remote. On the contrary, a repertory or catalogue of earthquakes, even of low overall critical value, may contain data with the value of direct testimony if close to the author. This classification enables the basic information types to be highlighted through an automatic procedure and classification of data for each single event.

This classification, which in the printed catalogue appears as the automatic result of the data base under the heading «state of knowledge», may be checked in the CD-ROM for each individual bibliographical entry, automatically displaying the bibliographical reference which appears as a note number.

The code «*val*» includes 13 fields, the 8 most important are here listed briefly:

- F direct source;
- Fi indirect source;
- Fn negative source, used *ex silentio*;
- R repertory or list of seismic events prior to the nineteenth century;
- C catalogue of earthquakes;
- B seismic bulletin;
- St historiographic contribution;
- Bs scientific contribution.

File B

This file contains the memorisation of the original texts, relative to each individual earthquake mentioned in the filed text, to which this part of the file has a computer link via a numeric code. Each text (description or document) is also linked to the code «*val*» and to the bibliographical code (*codbib*). This file forms the computerised archive of the original classified texts, used in the final processing. There are 14900 texts stored and they occupy more than 30 million characters (for the availability of these latest figures, see Boschi, in this volume).

The texts stored in their original versions in themselves form an archive of considerable value. In addition the availability of the original texts can make it possible for the CD-ROM user to decide to carry out further research to suit the purposes of possible specific studies by directly checking the interpretations proposed. This availability is obviously related to the resources that the various stages of the research have provided.

File A1

This part of the file concerns the centres of research, archives and libraries. Since the contacts with the centres of research extend far beyond the period of execution of the work in the centres, the references to address, telephone number, fax, etc. are kept updated in order to check or better define some aspects of the work: requests for microfilm, new printed inventories, or checks on new systems, etc. The data stored in this part of the file makes it possible not only to have a complete list of the locations in which the research was carried out, but also the automatic cartography of their geographical location. The number of locations in Italy in which the research was carried out came to a total of 780, of which 462 were archives and 318 libraries. There were sixteen foreign locations, of which 6 were archives and 11 libraries.

Classified bibliography

For each seismic event the relative classified bibliography is available. These are bibliographies constructed with the criteria of the database, for which each source used was filed individually in order to make it easier to find in the archive of the texts. The printed bibliography is in alphabetical order also in relation to the centres of research for unpublished texts (archives and libraries). In the CD-ROM the classification of the bibliography is accessed according to the following typology, used to indicate the value of the information used in relation to each event. This allows an evaluation to be made of the state of knowledge and can facilitate the programming of new research.

The attribution of the **VAL** code refers to the specific information for each event and not to the whole text.

F Direct source. Text written by a contemporary witness, trustworthy and geographically close to the event described, whose testimony possesses the requisites of reliability and authoritativeness.

It may be:

- Literary, memorialist.
- Public, ecclesiastic or private (archive) documentary.
- Journalistic (if reporting direct chronicles or letters).
- Naturalistic (direct findings).
- Scientific (macroseismic cards, direct field measurements, etc.).

Fi Indirect source. This includes:

- Texts of local historiography which are particularly authoritative and close to the event.
- Narrative sources of particular authoritativeness.
- Journalistic texts of the time.

R Repertory. List of earthquakes according to the viewpoint of literary and naturalistic erudition. It also includes the texts on the «freak events» typical of the beginning of the modern age and catalogues in general until before the nineteenth century.

Repertory-source is a direct sources of information, contained in an Inventory (see above), which in itself could not have the value of source since it is usually a collection of late and indirect information as a whole.

C Catalogue. List of earthquakes compiled for scientific or naturalistic purposes, from the nineteenth century onwards; may be based on selections of sources or works quoted or may not report any indication of the sources used. It may be descriptive or parametric.

A catalogue-source is a direct testimony contained in a catalogue of earthquakes, chronologically contemporary to the author or drawn up from direct observations by the author in person or transcribed in full from original texts.

B Bulletin. Publication produced through observation or recording by specialist centres; measuring table; series, even partial, of measurements within different contexts (deeds of academies, articles, etc.). Observations of seismic effects reported in the registers of observers have been considered F or Fi, depending on the cases.

St Historiographic study. This includes contributions from historians (not necessarily in the sense of recent critical historiography), specific studies about earthquakes of the past or about contemporary aspects of economic, demographic, social history etc. used to improve the analysis of the effects.

Bs Scientific bibliography. This includes contemporary studies conducted within a theoretic interpretative and cognitive framework, as from the nineteenth century, and recent studies on the earthquakes of the past.

Transcribed original texts. Archive of the stored original texts. For texts not in Italian (Latin, Greek, Arabic, Spanish etc.) the literal translations are given in Italian.

REFERENCES

- BARATTA, M. (1901): *I terremoti d'Italia. Saggio di storia, geografia e bibliografia sismica italiana*, Torino.
- BARATTA, M. (1910): *La catastrofe sismica calabro messinese (28 dicembre 1908)*, Roma (anastatic reprinting, Sala Bolognese, 1985).
- BERENGO, M. (Editor) (1962): *Giornali veneziani del Settecento*, Milano.
- BERENGO, M. (1976): Lo studio degli atti notarili dal XIV al XVI secolo, in *Atti del Congresso Internazionale sul 90° Anniversario dell'Istituto Storico Italiano*, Roma, vol. 1, 149-172.
- BONITO, M. (1691): *Terra tremante, o vero continuazione de' terremoti dalla Creatione del Mondo sino al tempo presente*, Napoli.
- BOSCHI, E., G. FERRARI, P. GASPERINI, E. GUIDOBONI, G. SMRIGLIO and G. VALENSISE (1995a): *Catalogo dei Forti Terremoti in Italia dal 461 a.C. al 1980*, ING-SGA, Bologna, pp. 973 and a CD-ROM.
- BOSCHI, E., R. FUNICIELLO, E. GUIDOBONI and A. ROVELLI (1995b): «Earthquakes in the past. Multidisciplinary approaches», *Ann. Geofis.*, **38** (5-6), 473-1029.
- BURNAND, Y. (1984): *Terrae Motus. La documentation épigraphique sur les tremblements de terre dans l'Occident romain*, in *Tremblements de terre histoire et archéologie, IVèmes Rencontres Internationales d'Archéologie et d'Histoire d'Antibes, 2-4 November 1983*, edited by B. HELLY and A. POLLINO, Valbonne, 207-219.
- CARUCCI, P. (1975): Lo scarto come elemento qualificante delle fonti per la storiografia, *Rassegna degli Archivi di Stato*, **35**, 249-264.
- CARUCCI, P. (1978): Versamenti e ordinamento degli archivi degli organi centrali dello Stato, *Rassegna degli Archivi di Stato*, **38**, 52-77.
- CASTRONOVO, V. and N. TRANFAGLIA (Editors) (1976-1980): *Storia della stampa italiana*, 6 vols., Roma-Bari.
- CILENTO, N. (1961): La struttura del racconto nelle Cronache Benedettino-Cassinesi della Longobardia meridionale nei secc. IX e X, *Bull. dell'Istituto Storico Italiano per il Medio Evo e Archivio Muratoriano*, **73**, 85-112.
- D'ADDARIO, A. (1975): La collocazione degli archivi nel quadro istituzionale dello stato unitario. I motivi ottocenteschi di un ricorrente dibattito (1860-1874), *Rassegna degli Archivi di Stato*, **35**, 11-115.
- DE ROSSI, M.S. (1882): Prefazione, *Bollettino del Vulcanismo Italiano*, **9**, 3-10.
- DE ROSSI, M.S. (1883): Programma dell'Osservatorio ed archivio centrale geodinamico presso il R. Comitato Geologico d'Italia, *Bull. del Vulcanismo Italiano*, **10**, 3-144 (also reprinted as separate work entitled «Programma dell'Osservatorio ed archivio geodinamico presso il R. Comitato Geologico d'Italia con istruzioni per gli osservatori e descrizione d'istrumenti», Roma, 1883).
- ENEL (1985): *Studi e indagini per l'accertamento della idoneità tecnica delle aree suscettibili di impianti nucleari. Regioni Piemonte, Lombardia e Puglia*. Research on historical seismicity by ISMES; project, research and working-out by SGA (Technical Reports in 42 volumes, about 18000 pages; 9 monographs in 14 volumes, about 6000 pages and 1500 maps with macroseismic effects). Unpublished reports available at ING and other Italian public institutions and research institutes.
- ENEL (1986): *Studi e indagini per l'accertamento della idoneità tecnica delle aree suscettibili di impianti nucleari. Regione Puglia*. Research on historical seismicity by ISMES; project research and working-out by SGA: supplements. Unpublished reports available at ING and other Italian public institutions and research institutes.
- FERRARI, G. (1992): Origin and development of a method of measurement in early seismology, in *Proceedings of the XI Scientific Instruments Symposium, Bologna, 9-14 September 1991*, 179-189.
- FIGLIUOLO, B. (1988-1989): *Il terremoto del 1456*, 2 vols., Altavilla Silentina.
- FILANGERI, R. (1956): Gli archivi privati, *Rassegna degli Archivi di Stato*, **16**, 327-340.
- FILIPPO DA SECINARA (1653): *Trattato universale di tutti li terremoti occorsi e noti nel mondo con li casi infauisti ed infelici pressaggiati da tali terremoti*, Aquila.
- FUMAGALLI, V. (1978): Il Regno italico, in *Storia d'Italia*, vol. II, Torino.
- FUMAGALLI, V. and E. GUIDOBONI (1989): I terremoti nel paesaggio urbano e rurale dei secoli VI-X, in *I terremoti prima del Mille in Italia e nell'area mediterranea. Sto-*

- ria archeologia sismologia, edited by E. GUIDOBONI, ING-SGA, Bologna, 264-279.
- GALASSO, G. (1965): *Mezzogiorno medievale e moderno*, Torino (reprint 1975).
- GARUFI, C.A. (1899): *I documenti inediti dell'epoca normanna*, Palermo.
- GASPARINI, C. (1983): *Catalogo dei terremoti italiani dal 1450 a.C. al 1980*, internal report by Istituto Nazionale di Geofisica, Roma.
- GIARDINA, A. (Editor) (1986): *Società romana e impero tardoantico*, Roma-Bari.
- GUALCA, A. and P. CARRETTA (1984): *Interviste ai testimoni dei terremoti del 16 ottobre 1943 e 29 giugno 1944 (Piemonte)*, Archivi SGA, 10/4-10/8 (recording).
- GUIDOBONI, E. (1986): I lunghi percorsi delle notizie, in *Il terremoto di Rimini e della costa romagnola: 25 dicembre 1786. Analisi e interpretazione*, edited by E. GUIDOBONI and G. FERRARI, Bologna, 30-33.
- GUIDOBONI, E. (Editor) 1989: *I terremoti prima del Mille in Italia e nell'area mediterranea. Storia archeologia sismologia*, ING-SGA, Bologna, pp. 765.
- GUIDOBONI, E. (1996): Archaeology and Historical Seismology: the need for collaboration in the Mediterranean area, in *Archaeoseismology*, edited by S. STIROS and R.E. JONES, Athens, 7-13.
- GUIDOBONI, E. (2000): Archeosismologia, item in *Dizionario di Archeologia. Temi, concetti, e metodi*, edited by R. FRANCOVICH and D. MANACORDA, Roma-Bari, 29-34.
- GUIDOBONI, E. and G. FERRARI (1989): The inexact catalogue: the study of more than 1700 earthquakes from the XI to the XX centuries in Italy, *Terra Nova*, **1**, 151-162.
- GUIDOBONI, E. and C. MARMO (1989): Impossibili o probabili? I terremoti nelle fonti agiografiche, in *I terremoti prima del Mille in Italia e nell'area mediterranea. Storia archeologia sismologia*, edited by E. GUIDOBONI, ING-SGA, Bologna, 330-334.
- GUIDOBONI, E., A. COMASTRI and G. TRAINA (1994): *Catalogue of Ancient Earthquakes in the Mediterranean Area up to the 10th Century*, ING-SGA, Bologna, pp. 504.
- JOHNS, J. (1989): Il silenzio delle fonti arabe sulla sismicità della Sicilia, in *I terremoti prima del Mille in Italia e nell'area mediterranea. Storia archeologia sismologia*, edited by E. GUIDOBONI, ING-SGA, Bologna, 306-319.
- LANCIANI, R. (1918): Segni di terremoti negli edifici di Roma antica, *Bollettino della Commissione Archeologica Comunale di Roma*, **45**, 3-28.
- LIGORIO PIRRO (1574-1577): Libro o trattato de diversi terremoti, raccolti da diversi autori, per Pyrro Ligorio cittadino romano, mentre la città di Ferrara è stata percossa et ha tremato per un simile accidente del moto della terra, Archivio di Stato di Torino, Antichità Romane, vol. 28.
- LIVA, A. (1979): *Notariato e documento notarile a Milano dall'alto medioevo alla fine del Settecento*, Roma.
- MAGRI, G. and D. MOLIN (1983): *Il terremoto del dicembre 1456 nell'Appennino centro-meridionale*, ENEA RT/AMB (83) 8, Roma.
- MANETTI GIANNOZZO, *De terraemotu libri tres*, Biblioteca Apostolica Vaticana, cod. Urbinate lat 5, cc.161r-215v (Italian translation by C. Scopelliti, notes by C. Scopelliti and D. Molin, ENEA, Roma 1983).
- MANNORI, L. (1994): *Il sovrano tutore. Pluralismo istituzionale e accentramento amministrativo nel principato dei Medici (secc. XVI-XVIII)*, Milano.
- MARIOTTI, D. (1991): Le voci più autorevoli del dibattito sismologico tra 1850 e 1880, in *Tromometers Seismoscopes Seismographs. Observations and Theories Between 1850 and 1880*, edited by G. FERRARI, Bologna, 81-106.
- MARIOTTI, D., A. COMASTRI and E. GUIDOBONI (2000): «Unknow» earthquakes: a growing contribution to the Catalogue of Strong Italian Earthquakes, *Ann. Geofis.*, **43** (4), 793-801 (this volume).
- MONGITORE, A. (1743): *Istoria cronologica de' terremoti di Sicilia, in Della Sicilia ricercata nelle cose più memorabili*, tome 2, 345-445, Palermo.
- PETRUCCI, A. (1958): *Notarii, documenti per la storia del notariato italiano*, Milano.
- PETRUCCI, A. (1992): *Medioevo da leggere. Guida allo studio delle testimonianze scritte del Medioevo italiano*, Torino.
- PLESSI, G. (1972): *Lo scarto*, Bologna.
- POSTPISCHIL, D. (Editor) (1985): *Catalogo dei terremoti italiani dall'anno 1000 al 1980*, *Quad. Ric. Sci.*, CNR-PFG, **114** (2B), Roma.
- SALADINO, A. (1970): *Gli archivi privati*, Roma.
- SCHIANTARELLI, P. and I. STILE (1784): *Atlante iconografico allegato a Istoria de' fenomeni del tremoto avvenuto nelle Calabrie, e nel Valdemone nell'anno 1783 posta in luce dalla Reale Accademia delle Scienze, e delle Belle Lettere di Napoli di Michele Sarconi*, Napoli (reprint edited by E. ZINZI, Catanzaro-Roma, 1990, 2a ed.).
- SERVA, L., A.M. BLUMETTI and A.M. MICETTI (1986): Gli effetti sul terreno del terremoto del Fucino (13 gennaio 1915): tentativo di interpretazione della evoluzione tettonica recente di alcune strutture, *Mem. Soc. Geol. Ital.*, **35**, 893-907.
- TRASSELLI, C. (1949): *I privilegi di Messina e Trapani*, Palermo.
- TRAINA, G. (1989): Tracce di un'immagine: il terremoto tra prodigio e fenomeno, in *I terremoti prima del Mille in Italia e nell'area mediterranea. Storia archeologia sismologia*, edited by E. GUIDOBONI, ING-SGA, Bologna, 104-115.
- VIVENZIO, G. (1783): *Istoria e teoria de' tremuoti in generale ed in particolare di quelli della Calabria, e di Messina del MDCCCLXXXIII*, Napoli.
- WARD-PERKINS, B. (1984): *From Classical Antiquity to the Middle Ages. Urban Public Building in Northern and Central Italy A.D. 300-850*, Oxford.
- ZANNI ROSIELLO, I. (1983): Spurghi e distruzioni di carte d'archivio, *Quad. Stor.*, **58**, 985-1017.