

# The 1448 earthquake in Catalonia. Some effects and local reactions

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## Abstract

The May 1448 earthquake, the last destructive one that took place in Catalonia in the Middle Ages, was known chiefly from several chronistic and narrative medieval sources. To these sources I add new previously unknown data proceeding from documentary archival sources in Barcelona, and other data that up to now have been wrongly considered as a consequence of the weak quake recorded in September 1450. They allow us to locate the epicentre in the Vallès Oriental, around Llinars, to deny the existence of two almost simultaneous earthquakes, and to extend the range of the earthquake damage, to pinpoint them better and to suppose that the effects of the 1448 earthquake were more important than we had previously thought. All this information leads to several reflections on compulsory critical analysis of historical seismic documentary sources in order for them to be useful to historical seismicity. Finally, by the opposition of the three kinds of documentary sources that refer to the damage caused by the earthquake in the township of Mataró, I show how natural catastrophes could be manipulated, and the skill of a society in exploiting them to deal with an adverse situation.

**Key words** *historical seismicity – Catalonia – mediaeval sources*

## 1. Introduction

The earthquake that took place in Catalonia on the night of 24th-25th May, 1448 was the last of mediaeval destructive earthquakes documented in Catalonia (Riera *et al.*, 1986) (fig. 1).

This earth tremor was known, essentially, from several contemporary chronistic and narrative sources from Barcelona (*Dietari* and *Jornades*), Perpinyà (*Livre*), Vic (*Acords*) and Girona (*Revista*). These sources are described in the attached list of sources and their content is shown in tables I and II.

All these sources are grouped together in a work that, in spite of the years elapsed, still concentrates most of the known records referring to the historical earthquakes of the Catalan-speaking area, *Recopilació de dades sísmiques de les terres catalanes entre 1100 i 1906* (Fontserè and Iglésies, 1971), which is

still the essential point of reference for Catalan historical seismicity. Working basically from an analysis and systematization of the information obtained from this work, Suriñach and Roca produced their catalogue of Catalonia's earthquakes (1982).

To these sources I can now add new unpublished data, of archival origin, obtained in the *Arxiu Diocesà de Barcelona* (ADB, *Gratiarum*) and in the *Arxiu de la Corona d'Aragó* of Barcelona (ACA). From the ADB, there are several episcopal licenses to collect alms to repair many churches and chapels damaged by the earthquake, located in Barcelona's bishopric, as Mataró, Santiga, Monteugues and Les Espases. From the ACA, a royal privilege granted by Queen Maria in 1453 to honour credit debts and to carry out the repairs needed in the churches, bell towers and bells damaged by the earthquake in the churches around Mataró.

Moreover, the damage suffered by the churches of Santa Maria de Fucimanya and Sant Cristòfol de Ripoll, in the bishopric of Vic

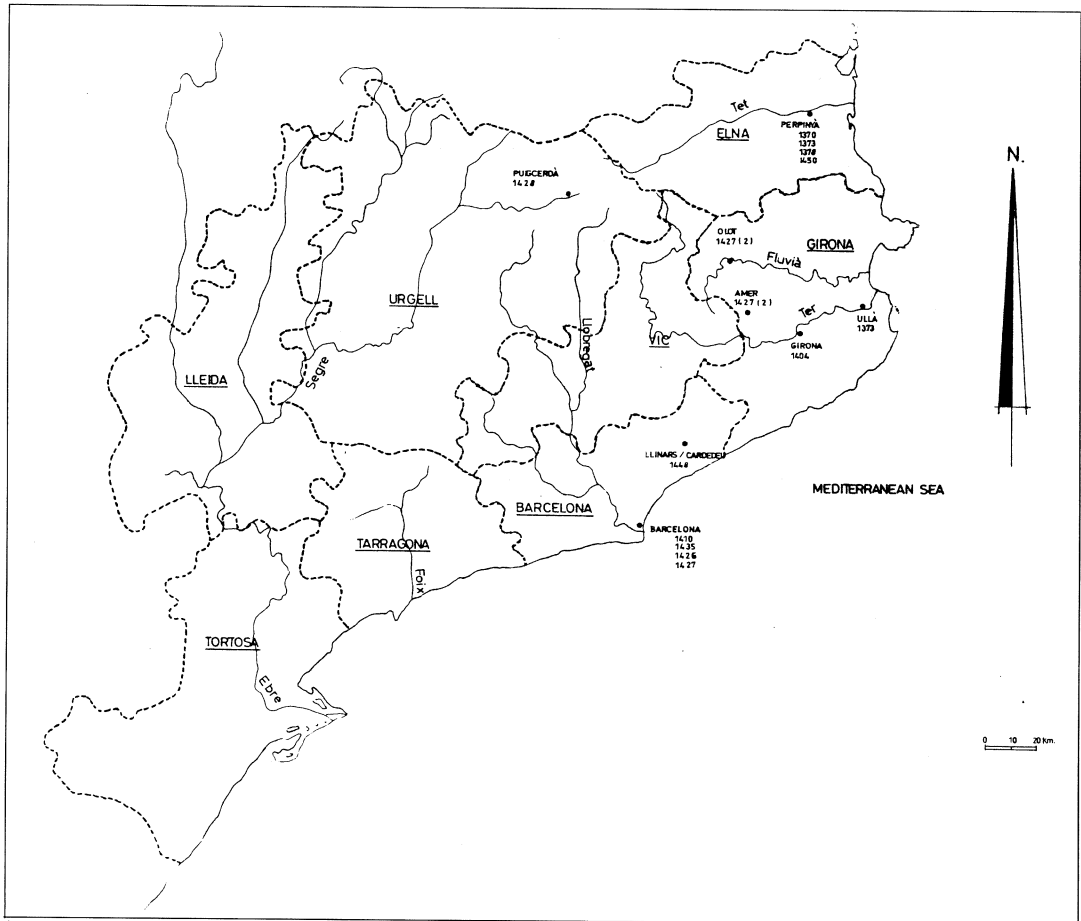


Fig. 1. Epicentres of the medieval earthquakes of Catalonia.

(ADV), must be transferred to 1448. Fontserè and Iglésies (1971) had wrongly considered them consequences of an earthquake that took place in September 1450, what cannot be true, because this damage was recorded in the Arxiu Diocesà de Vic (ADV) in July 1450. For this reason, we can assume that the September 1450 quake was a weak shake, because, according to the known data, it only knocked down a house in Perpinyà, even though it was also perceived in the other extreme of the country, in Tàrrrega, as shown by Fontserè and Iglésies (1971).

## 2. The 1448 earthquake

In order not to overload the text with data or historical records, I present all the known information about the 1448 earthquake in tables I and II; the only thing that I have done is to systematize it and loyally translate it, without modifying the content of the sources nor the language they use.

Although it is usually difficult to determine the time of origin and duration of mediaeval earthquakes because time units used in that period are not always easy to convert into our

**Table 1.** General description and data contributed by the chronic or narrative sources.

General geographical coordinates	Sources	Description of the earthquake	Temporal parameters		Global evaluation and/or description of the effects
			Time	Duration	
In Barcelona and in all the Principality of Catalonia	<i>Dietari</i>	Very big	After midnight on Friday 24th, as it changed to Saturday, it was between 12 p.m. and 1 a.m.	It is not indicated	It caused enormous damage to a great number of possessions, both in the city of Barcelona and outside it; it caused a lot of damage all over Principality, causing many deaths and destroying a great deal of property
In the city of Barcelona and in all the Principality of Catalonia	<i>Jornades</i>	Very big	Around midnight	It is not indicated	It caused great damage to a lot of possessions, both in the city of Barcelona and outside it, it demolished a lot of <i>masies</i> (farmhouses) and it caused great damage all over Catalonia
In the city of Perpinyà and in all the land of the Rosselló	<i>Livre Vert</i>	Very big	It was during the first hour after midnight	It lasted the length of one Lord's Prayer and an Ave Maria, or even more	People were very afraid, not without reason
They are not indicated; it is only specified that in the city of Vic there was no damage or death	<i>Acords</i>	Terrifying, very big	Around midnight	It is not indicated	It demolished a lot of hamlets, houses, monasteries and other churches, and when they fell down a lot of people died; it knocked down a lot of churches, houses and <i>masos</i> (farmhouses), and many people died in them
In the city of Girona, in Barcelona and in the Vallès	<i>Revista</i>	Very big	Between 12 p.m. and 1 a.m.	It is not indicated	More than 108 people died under the ruins of the demolished houses

Table II. Damage induced by the earthquake in each town.

Places	Sources	Buildings	Effects(*)	Damage and effect description
Barcelona	<i>Dietari &amp; Jornades</i>	- Castell Nou (castle)	D	- It opened a fissure in the castle so wide that a person could pass through
		- Houses of the abbot of Ager and the abbot of Ripoll, close to the church of Sant Miquel	D	- It caused much damage
	<i>Revista</i>	- House of Bernat Esplugues' heirs	D	- It caused much damage
		- House of Bernat Fiveller	D	- It caused much damage
		- House of Joan de Barqueres	D	- It caused much damage
		- Many other houses	D	- It caused much damage
Bigues	<i>Dietari &amp; Jornades</i>	- City	P	- Not indicated
		- Castell Nou (castle)	D	- It suffered great damage
Calaf	<i>Jornades</i>	- House of Ombert de Bigues	D/M	- It knocked down the house
		- Castle	D	- It killed 2 women
Estany, L'	<i>Dietari &amp; Jornades</i>	- Castle	D	- It crushed <i>in a very ugly way</i> the façade of the castle
		- Monastery	D/M	- It knocked down the monastery
Girona	<i>Acords</i>	- Monastery and church of Santa Maria de l'Estany	D	- It killed a monk
		- City	P	- It knocked down the monastery
Granollers	<i>Revista</i>	- Church	D	- Not indicated
		- Town of Llinars and region of the Vallès	D	- It knocked down part of the church
Llinars	<i>Dietari &amp; Jornades</i>	- Castle	D	- It knocked down the castle
		- Parish church of Santa Maria	D/M	- People died due to the collapse of houses
Mataró	<i>Dietari &amp; Jornades</i>	- Parish church of Santa Maria	D	- It knocked down part of the church
		- Parish church of Santa Maria	D	- Steeple of the church half split and destroyed, as were bells, in such a way that, if it were not immediately repaired, the church was in danger of falling down
ACA		- Parish church of Santa Maria	D	- The church, the belfry and the bells suffered serious damage and ruin

Table II (continued).

Places	Sources	Buildings	Effects(*)	Damage and effect description
Montornès	<i>Dietari &amp; Jornades</i>	- Castle	D	- It knocked down the castle
Papiol, El	<i>Dietari &amp; Jornades</i>	- Castle	D/M	- It knocked down the castle - It killed 3 men
Perpinyà	<i>Livre</i>	- Village of Perpinyà and region of the Rosselló	P	- Not indicated
Santa Maria de Fucimanya	ADV	- Church of Santa Maria de Fucimanya, in the parish of Sant Martí de Serraiüa	D	- Church damaged because of the earthquake
Sant Andreu de Llavaneres	ACA	- Parish church	D	- The church, the belfry and the bells suffered serious damage and ruin
Sant Cristòfol de Monteguges	<i>Gratiarum</i>	- Parish church	D	- The parish church was completely destroyed; it must be rebuilt again
Sant Cristòfol de Ripoll	ADV	- Church of Sant Cristòfol, in the parish of Ripoll	D	- It fell down because of the earthquake; a new one must be built to replace it
Santiga	<i>Gratiarum</i>	- Parish church	D	- The destruction and the demolition prevented services from being performed
Sant Miquel de Mata	ACA	- Church of the parish of Sant Miquel de Mata, in the area of the village of Mataró	D	- The church, the belfry and the bells suffered serious damage and ruin
Sant Salvador de les Espases	<i>Gratiarum</i>	- Hermitage of Sant Salvador de les Espases, in the parish of Esparreguera	D	- Because of a fire and the earthquake, the hermitage is mostly flattened; neither the person that takes care of it nor visitors may stay in the hermitage, being in great danger
Sant Vicenç de Llavaneres	ACA	- Parish church	D	- The church, the belfry and the bells suffered serious damage and ruin
Sentmenat	<i>Dietari &amp; Jornades</i>	- Castle	D/M	- It knocked down the castle - It killed a boy
Vic	<i>Acords</i>	- City	P	- Not indicated

(\*): D = documented destructive effects; P = perception of the earthquake; M = deaths caused by the earthquake.

contemporary time system (Riera, 1987), fortunately, with regard to the time of the 1448 earthquake, there exists perfect agreement between the different documentary sources, which locate it during the night of Friday 24th to Saturday 25th May, after midnight but before 1 a.m., being, therefore, on Saturday 25th (see table I). And although the duration of the shake is only mentioned in the account from Perpinyà (*Livre*) and it only refers the remotest area to the centre of the earthquake, its description is very specific, because it refers to a period of time longer than one Lord's Prayer and one Ave Maria (see table I).

Most of the new obtained data are concentrated in the Vallès and the coast of the Maresme, around Mataró (Sant Vicenç and Sant Andreu de Llavaneres and Sant Miquel de Mata).

First of all, this allows us to confirm the hypothesis of the geographers Fontserè and Iglésies (1971), who considered that the epicentre of the 1448 earthquake was located in the Vallès, around Llinars, a town close to the Litoral Mountain Range, which separates the two areas that were most damaged by the seism, the coastal flatness of the Maresme, in the Depressió Litoral (Mataró, Llavaneres, Mata), and the flatness of the Vallès, in the Depressió Pre-Litoral (Llinars, Granollers, Montornès, Bigues, Monteugues, Sentmenat, Santiga, el Papiol) (fig. 2).

The new data also allow us to extend the range of the earthquake's destructive effects not only to several churches of different localities in the bishopric of Barcelona that had not been documented up to date, but also, specially, to some points of the bishopric of Vic (Sant Cristòfol de Ripoll and Santa Maria de Fucimanya).

These new references to destructive effects in Central Catalonia, together with the references that were previously known in this area (l'Estany and Vic), enlarge the incidence of the seism in those lands. Furthermore, a critical analysis of all the available data excludes the possibility, raised by some authors, that on the night of 24th-25th May 1448 two almost simultaneous earthquakes occurred in Catalonia (Fontserè and Iglésies, 1971).

In my opinion, the exact coincidence of sources as regards temporal parameters makes the distinction between a shake in the southern part of Catalonia (Vallès – Barcelonès – Maresme) and another one perceived in the north (Perpinyà) improbable. Moreover, the existence of several testimonies in the centre of Catalonia (to which we have to add Sant Cristòfol de Ripoll) suggests a clear link between these two theoretical poles. Finally, the fact that the earthquake was perceived in the environment of Perpinyà but no destructive effects have been located there (which may not be due to a lack of sources because, for 1448, the *Livre Vert* is one of the most valuable ones) corroborates the existence of only one earthquake: the absence of damage in this area is explained by its long distance from the epicentre.

The map reflects all the information that I have been able to collect up to date on the effects of this earthquake, distinguishing between places that suffered destructive effects (explicitly stated in table II) and those that merely bore witness to the earthquake's perception.

On the other hand, with respect to the intensity of the seism, the new data does not allow us, in principle, to introduce modifications to the estimated epicentral intensity given previously by other authors. Therefore, we still consider valid the VII intensity degrees on the MSK scale given by Suriñach and Roca 1982), who updated the intensity VII-VIII on the Mercalli II scale given by Fontserè and Iglésies in 1971.

Besides considerable material damage, which is precisely described in the documental sources, as shown in table II, the 1448 earthquake also caused several deaths. However, in this respect, the sources are less concrete. The notary of Girona Nicolau Roca (*Revista*), which reports more than 108 deaths under the wreckage – most of them in the town of Llinars and in the region of the Vallès – seems exaggerated, because, probably, such a dramatic toll would have been more easily documentable and would have provoked a far greater reaction.

However, both the Vic source (*Acords*) and the *Dietari de la Generalitat* (*Dietari*) – but

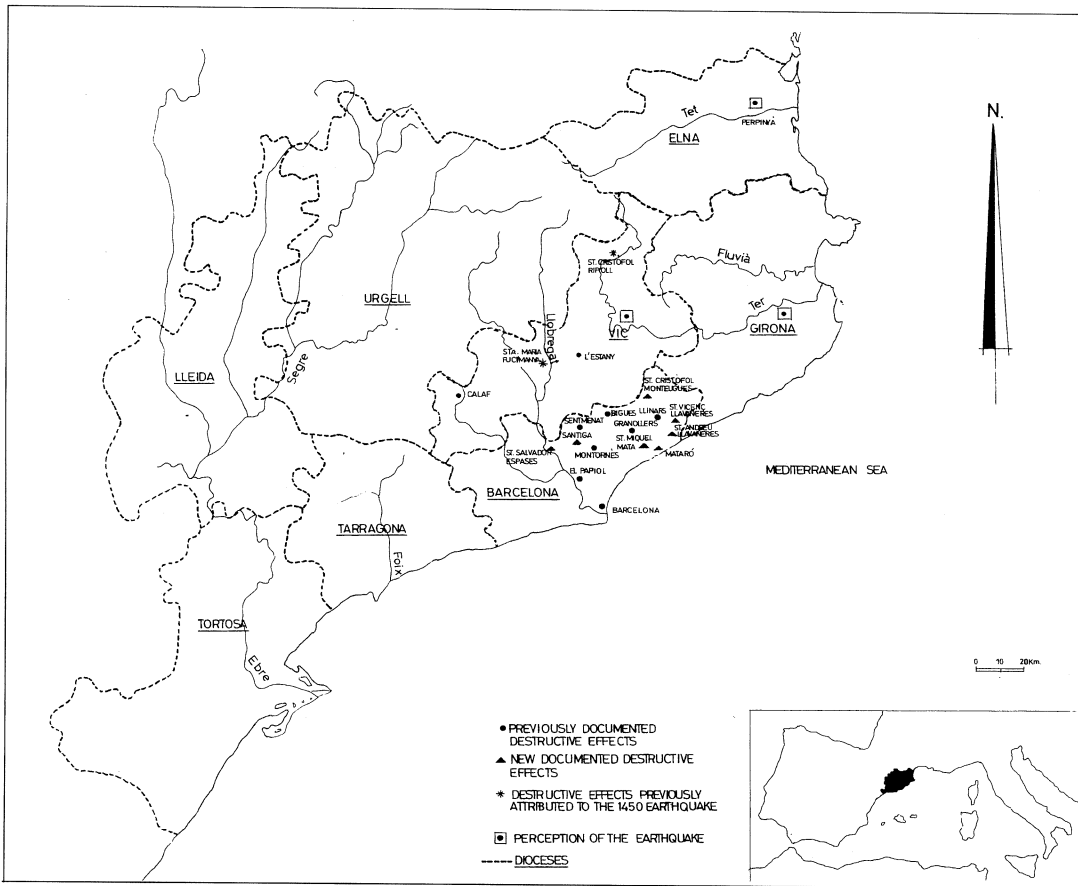


Fig. 2. Documented effects of the 1448 earthquake.

not the *Llibre de Jornades* (*Jornades*) – emphasize also, in their general evaluation of the earthquake’s effects, the death of several people under the ruins, without indicating the exact place (see table I).

Only the *Dietari de la Generalitat*, on this occasion in its two versions (*Dietari* and *Jornades*), specifies some of the buildings which buried some of the victims and itemizes the towns where they were located. Moreover, this source also specifies the sex of these victims and their age, by indicating when a person was not an adult. From this source, we can state that at least seven people died around

Barcelona: a monk in the monastery of Santa Maria de l’Estany, two women in a house in Bigues, one boy in the castle of Sentmenat and three men in the castle of El Papiol (see table II). Contrary to what was said by the Girona report (*Revista*), none of these deaths happened in Llinars, even though most of them were in the Vallès (Bigues, Sentmenat, el Papiol).

However, we should be prudent when handling and interpreting all the documentary data on the earthquake’s effects. Besides relativizing historiographical sources according to their nature and typology – as shown by Riera in his critical analysis of the most useful Catalan

documental typologies for historical seismicity (Riera, 1987) – it is also essential to weigh up the different elements that come into play for an earthquake to produce certain effects.

First of all, news of more or less death and destruction need not depend only on the higher or lower intensity of an earthquake. For instance, in the case of the shake of 1448, we must bear in mind that, during the night, the disaster must have taken the victims while they were sleeping. It is significant that all the deaths detailed were produced in dwellings (houses, castles and monasteries) and that, despite the collapse of the roofs of several churches, they did not bury anybody. If the earthquake had taken place during the day, it is evident that the results – worse or otherwise – would have been different.

On the other hand, before evaluating the effects of an earthquake on a particular building, we should try to determine, as far as possible, its state of repair before the shake. Maybe the instance of the *Castell Nou* (New Castle) of Barcelona, where the 1448 earthquake opened a fissure so wide that a person could pass through it, is the best example to illustrate what is meant: at least since 1418, its state of repair was already so precarious that the general royal bailiff of Catalonia advised the king that it would be better to pull down the castle completely than to restore it; nevertheless, the castle survived up to the XVIth century (Català, 1990). Thanks to the bishop's pastoral visits, an incalculably valuable source for historical seismicity, we can also determine the state of repair of Santa Maria, the parish church of Mataró, and its neighbouring ones – Mata and Llavaneres – before the 1448 shake: according to the 1446 pastoral visit, the closest to 1448, before the quake almost all those ecclesiastical buildings already needed some repair work (Salicrú, 1993); unfortunately – and contrary to what we find in the diocese of Girona with regard to the seismic series of 1427-1428 thanks to the pastoral visit of 1432 (Riera *et al.*, 1993) – in the bishopric of Barcelona there was no pastoral visit between 1446/47 and 1498, and, therefore, we cannot use pastoral visits here to evaluate the damage produced by the 1448 earthquake.

To obtain new data on the 1448 earthquake, which closes the first of the four known periods of ground instability in Catalonia and that, until 1763, is followed by a long period of calm (Riera, 1987), it will be necessary to continue looking for new data in the dispersed documentation that typologically and chronologically may contain them, in order to make concrete the damage caused by the earthquake in the affected area, from the Vallès Oriental, where the epicentre is located, up to North Catalonia and Perpinyà, where, although it was perceived, it does not seem to have had destructive effects.

### 3. The twofold reaction in Mataró. The use of an earthquake in the face of an adverse situation

As can be seen in table II, in the case of the township of Mataró three sources of different kinds (*Dietari* and *Jornades*; *Gratiarum*; ACA) provide us with information on the damage the earthquake caused in this town. The examination of the data from these different sources allows us to document and analyze the existence of a twofold reaction amongst the population with regard to the shake. Moreover, it allows us to observe a partial revision or manipulation of the damage by the people, in order to be able to profit as much as possible from it in the interests of the municipality.

Because of the earthquake, the parish church of Santa Maria de Mataró was damaged and in danger of falling into disrepair in its entirety; for this reason, spontaneously and almost immediately, the people of Mataró turned to the ecclesiastical authority, the bishop of Barcelona, in an attempt to obtain a license to be able to collect alms to repair it.

Five years later, in a more calculating fashion and still using the earth tremor as an excuse but with a clear will to meet the costs of the recent incorporation of the town into the Crown jurisdiction and to obtain greater autonomy in municipal government, the inhabitants of Mataró obtained from Queen Maria, spouse of Alfons the Magnanimous, a privilege with several measures in favour of the township.



But on this occasion the people of Mataró, who before had linked the effects of the earthquake with only one of the churches in the township, extended them to three additional churches.

The *Dietari* indicates, in both of its versions (*Dietari* and *Jornades*), that the earthquake knocked down part of the parish church of Santa Maria de Mataró. Its version is perfectly consistent with the version of the document that, only a couple of months after the earthquake, allows us to know the results of the first reaction of the population, that is, it agrees with the version supplied by the episcopal license: the highest part of the church, together with the bells, had been split and, if it were not immediately repaired, the whole church could have been ruined (*Gratiarum*).

On the other hand, when they appealed to the queen in 1453, the people of Mataró referred not only to the material losses induced by the earthquake on the church of Santa Maria, but also to the other parish churches in the township – the churches of the neighbouring villages of Sant Andreu and of Sant Vicenç de Llavaneres – and to the hermitage of Sant Miquel de Mata, suffragan of the one in Mataró. According to the introduction of the document that was presented to the queen, it was necessary to carry out repairs to all of them and on all their belfries and bells (ACA).

The geographical situation of all these churches, that is, their proximity to the church of Mataró – where the damage was, previously, doubly witnessed by the *Dietari* (*Dietari* and *Jornades*) and by the episcopal documentation (*Gratiarum*) – and to the probable epicentre of the shake, mean that we cannot discard the possibility that these buildings were also affected by the vibration, and even that it really affected their structure or their weakest part, the belfries.

However, the sequels of the earthquake in all of them, silenced until that time, must have been less tragic than the damage in the church at Mataró.

Whatever damage was done in the villages that made up the township of Mataró, the fact is that, in 1453, their inhabitants were clever enough to derive new profit from the ruins of

the earthquake, using them as an argument to convince the queen to agree to concede them several measures aimed at obtaining treasury benefits and a greater autonomy in municipal regime and government.

The privilege conferred by Queen Maria contained four chapters covering a variety of points. In fact, despite mentioning in its introductory part the need to perform repairs on the churches and the economic incapacity of the town to afford them, really none of the queen's concessions refer, directly or indirectly, to the earthquake or to the damage caused by it.

Above all, the earthquake made it possible to obtain a deferment of the debt contracted by the people of Mataró in 1419 to meet the economic costs of the town's redemption from feudal jurisdiction. Secondly, it made it possible for the community to nominate and designate its royal bailiff from that time on, a privilege that until then had only been exercised by the king. Moreover, the town obtained the power to legislate on matters of internal order, the right to tax the products sold in the local market and the authority to penalize the non-fulfilment of its provisions. Finally, the municipal authorities obtained a license to fortify the church of Santa Maria and to build fortresses and gateways in the town in order to protect it against possible attacks by pirates, whether by land or sea, a license that was in fact tantamount to the right to impose on the inhabitants of the township whatever tax burdens were considered necessary to that end.

SOURCES: LOCATION, TYPOLOGY  
AND DESCRIPTION

ACA (Arxiu de la Corona d'Aragó), Cancelleria, register 3158, ff. 164 r.-166 r. (1453, July, 20. Barcelona). Published in my paper (Salicrú, 1993), pp. 14-16. Privilege granted by Queen Maria of Castile, wife and lieutenant of king Alfons the Magnanimous of Catalonia-Aragon, in favour of the township of Mataró, with several concessions of a financial, commercial and defensive nature, so that it could honour its debts and carry out the repairs needed in the churches, the bell towers and the

bells of the township that had been damaged in the earthquake.

*ACORDS, Llibre d'*, (1424-1451), of the Arxiu Municipal de Vic, minutes for November 11th, 1448. Edited by A. de V. i de R. in *Butlletí del Centre Excursionista de Vich*, 22 (1917), pp. 157-158. Agreements book of the municipal council of Vic. On November 11th 1448 the council established the Festivity of Sant Just, because, during the earthquake, the saint had preserved the town from death and destruction.

ADV (Arxiu Diocesà de Vic), *Lib. Just.* (1450, July, 14. Vic). Quoted by FONTSERÈ and IGLÉSIES (1971), p. 211. License to collect alms to repair the church of Santa Maria de Fucimanya, in the parish of Sant Martí de Ser-raïma, damaged in the earthquake, granted by the bishop of Vic.

ADV, document of 1450 quoted by E. FONTSERÈ and J. IGLÉSIES (1971), p. 211. License to build a substitute church or chapel to replace that of Sant Cristòfol, in the parish of Ripoll, destroyed by the earthquake, granted by the bishop of Vic.

*DIETARI de la Deputació del General de Catalunya*, vol. I (1411-1458), Barcelona, Colección de Documentos Inéditos del Archivo de la Corona de Aragón (CODOIN), 1974, p. 181. Record book of the court clerk of the *Diputació del General de Catalunya*.

*GRATIARUM*, ADB (Arxiu Diocesà de Barcelona), volume 35, f. 14 r. ([1448], August, 3. Barcelona). Published in my paper (Salicrú, 1993), p. 14. License to collect alms to repair the parish church of Santa Maria de Mataró, damaged in the earthquake, granted by the bishop of Barcelona.

*GRATIARUM*, ADB, volume 35, f. 106 r.-v. (1449, September, 5. Barcelona). License to collect alms to repair the parish church of Santiga, damaged in the earthquake, granted by the bishop of Barcelona.

*GRATIARUM*, ADB, volume 35, f. 109 v. (1449, September, 16. Barcelona). License to collect alms to repair the parish church of

Sant Cristòfol de Monteagues, damaged in the earthquake, granted by the bishop of Barcelona.

*GRATIARUM*, ADB, volume 36, f. 193 r. (1453, August, 3. Barcelona). License to collect alms to repair the chapel of Sant Salvador de les Espases, in the parish of Esparreguera, damaged in the earthquake, granted by the bishop of Barcelona.

*JORNADES, Llibre de, (1411-1484) de Jaume Safont*, edited by J.M. SANS I TRAVÉ (1992), Barcelona, Fundació Noguera, Textos i Documents 28, pp. 52-53. Private record book of Jaume Safont, court clerk of the *Diputació del General de Catalunya* in 1448, as a result of which the *Dietari* and the *Llibre de Jornades* are written by the same person. The two versions of the *Dietari* are almost identical, and do not offer meaningful differences in the contents of the description of the effects of the earthquake. There exist only some discrepancies in the detail of the exposition.

*LIVRE Vert Mineur* of the Arxiu Comunal de Perpinyà. Quoted by E. FONTSERÈ and J. IGLÉSIES (1971), p. 205. Calendar with marginal annotation of the events that, at that time, were considered outstanding.

*REVISTA de Gerona*, 5 (1881), p. 467, transcribes part of a manuscript by the notary Onofre Caxas (from Castelló d'Empúries, Girona), entitled *Notabilium rerum diversarum*, which in turn transcribes an inscription about the 1448 earthquake found in a manual of 1449 by the Girona notary Nicolau Roca. An error in the interpretation of the highly confusing explanation of the origin of the text published in the *Revista de Gerona*, induced Fontserè and Iglésies (1971), p. 206, to believe that the original belonged to the *Pia Almoïna* in Girona.

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