

## Earthquakes of 27 March and 8 June 1638

### STATE OF EARTHQUAKE REVIEW

The earthquake is recorded in all treatises and inventories of earthquakes published from the middle of the seventeenth century (Filippo da Secinara, 1652; Magnati, 1688; Paragallo, 1689; Bonito, 1691; Marcelino, 1697) till the modern catalogues (Capocci, 1861; Mercalli, 1883; Baratta 1901).

The eighteenth-nineteenth century local historiography had the merit of publishing documents difficult to find regarding some minor centres or buildings of special importance (sanctuaries, coastal towers).

The recent studies (Saletta, 1976; Naccarato, 1977; Novi Chavarria, 1985; Chiodo *et al.*, 1996) were sporadic and regarded particular details.

The earthquake of March-June 1638 was testified by numerous accounts and memoirs published close to each other in time on the basis of direct observations and first-hand reports. Thanks to the availability of this remarkable and reliable patrimony of data the documentary research focused on integrating and enriching the information in order to determine the area of the damage and the extent of the hit area precisely, and to outline the social and economic impact of the event.

We have examined the archival documentation of the *Archivo General de Simancas*, fond *Secretarias Provinciales* where two important documents were found that attest the destruction caused by the earthquake, the first-aid measures, and the considerable fiscal damage which was feared as a consequence of the seismic event. At the *Archivo di Stato di Napoli* we examined the fonds *Regia Camera della Sommaria*, *Consiglio Collaterale* and *Segreteria del Viceré* where numerous documents are preserved

regarding the administrative procedure activated after the earthquake. In the *Archivio Segreto Vaticano*, in the fonds *Nunziatura di Napoli*, *Miscellaneo* and *Sacra Congregatio Concilii*, we found relevant diplomatic and ecclesiastic documentation that has provided much information on the effects of the earthquake, in particular on religious buildings.

At the *Archivo General de Simancas* in the fond *Secretarias Provinciales* we found two consults of the *Consejo de Italia*. The first one, dated 30th July 1638, relates to the communication on 12 April made by the viceroy Medina de las Torres on the very heavy damage caused by the earthquake and on the first measures taken. The second consult of August 2 refers to a letter of the representative of the *Camera della Sommaria* Alonso de la Carrera, dated June 20, that refers to the heavy repercussions that the destructions would have on the income of the Kingdom due to the strong decrease of the fiscal revenue and customs duties.

At the *Archivo di Stato di Napoli* we examined the fonds of the *Regia Camera della Sommaria*, of the *Consiglio Collaterale* and of the *Segreteria del Viceré*. Numerous documents were found and analysed, regarding the entire procedure of the intervention of the central government, from the appointment of Ettore Capecelatro, member of the *Consiglio Collaterale*, as plenipotentiary for the Calabrian provinces, till the decrees of tax exemption issued by the viceroy.

The administrative documents concerning this earthquake were divided by type of deeds and offices of destination, according to the complex structure of the Royal Chancery. The expenses were decided by the *Regia Camera della Sommaria*, of which there remains, in particular, an

account relating to the organisation of the mission of Capeceiatro, charged with control of the damage in the various villages, the organisation of first aid to the hit populations and some particular interventions relative to the tax exemptions for the minor Calabrian centres.

Most of the documents produced by the local communities or regarding the situation of single villages are preserved in the archives of the *Consiglio Collaterale* and the *Viceré*, where we found pleas, requests for exemption and applications for building permissions.

From the deeds of Giovanni Tommaso Blanch, representative and general deputy of *Calabria Ultra*, preserved in the fond *San Martino* of the National Library of Naples, the provisions for the estimate of the damage suffered by the coastal defence towers and of their restoration can be deduced.

Important sources are those of the *Archivio Segreto Vaticano* where diplomatic as well as ecclesiastic documentation was analysed. Particularly rich in direct information on the effects of the earthquake are the letters of the papal nuncio Nicolò Herrera, preserved in the fond of the Nunciature of Naples and the account sent to the Secretary of State, Cardinal Barberini, by the Neapolitan ecclesiastic Paolino Bianchi, based on the direct testimonies of Cosenza and of the sailors and fishermen travelling along the Tyrrhenian coast and preserved in the fond *Miscellaneo*.

Information on the damage suffered by the religious buildings and on the reconstruction procedures can be found in the episcopal accounts preserved in the fond *Sacra Congregatio Concilii* regarding the Calabrian dioceses of Belcastro, Cariati and Cerenza, Catanzaro, Cosenza, San Marco Argentano and Bisignano, Mileto, Nicastro, Santa Severina, Squillace, Umbriatico. To this information must be added the information contained in the yearly account on the «Neapolitan Province» that the Jesuit provincial for the Southern area sent to Rome in 1638 and is preserved in the *Archivio Generale della Compagnia*.

Of the published sources, the most important texts to evaluate the degree of the damage are the accounts sent to the viceroy by the councillor Ettore Capeceiatro, published by D'Orsi (1640).

These accounts provide information concerning about 200 inhabited centres. For each locality there are listed the number of deaths, divided by sex and classes of age, the number of destroyed or heavily damaged buildings – with a particular attention to the more important constructions (churches, castles, monasteries, town-walls, convents, mansions) – and a synthetic, qualitative comment on the general conditions of the place: «completely razed to the ground», «almost completely ruined», «little damaged».

Amongst the memorial sources, because of their importance, stand out the works of Lucio D'Orsi (1640) and of Agazio Di Somma (1641), who were direct witnesses of the events at respectively Belcastro and Catanzaro. Also important is the work in the Latin language by the Jesuit Giulio Cesare Recupito (1638) who obtained his information from various oral and epistolary sources. More details are provided by the anonymous *Vera relatione...* (1638) printed in Rome and the two letters by Bumaldi (1638) and Colla Aurigemma (1638) published as a notice at Bologna. Less descriptive and more theoretic are the works by Bernaudo (1639) and Apires (1639).

Another testimony of great value was reported by the illustrious German erudite and naturalist Athanasius Kircher, who at the time of the earthquake was sailing along the Tyrrhenian coast of Calabria and had directly observed the effects of the shock of 27 March at Sant'Eufemia and in other coastal towns. Kircher published the story of what he saw in the *Praefatio* of his treatise *Mundus Subterraneus* (1665).

#### THE EARTHQUAKE'S SOCIAL CONTEXT

The shocks of 1638 hit many of the inhabited centres of Calabria, amongst which cities of a political-economic importance like Catanzaro and Cosenza, and numerous fortified villages along the Tyrrhenian coast which were defences against the Turkish invasions. The number of victims was very high. The official estimates by Capeceiatro stated 9571 deaths, of which 6811 at Calabria Citra and 2760 at Calabria Ultra, but these figures were probably underestimated as they did not take into account the mortality rate in the marginal centres compared with the most

damaged area, and most of all with the numerous deaths during the months after the shock of 27 March due to wounds and privations.

During the first decades of the seventeenth century Calabria suffered a strong economic crisis that can be connected to the more general one that hit the Kingdom of Naples and many European countries. The strong comeback of the Turkish incursions led the populations to leave the countryside of the coastal areas. Moreover, the forced recruitment for the defence of the wartime coasts and countrysides in Northern Italy determined a consistent decrease of the labour force used in agriculture and a strong drop in production with a consequent backdrop of the activity in the commercial and crafts sectors. The hardships of the population were exacerbated by the new reinforcement of the feudal rule; in fact the feudatories used the difficult economic-political conjuncture which hit the Spanish monarchy, to reinforce its own structures of power.

This economic and political context – the extreme destruction caused by this earthquake, the deaths of thousands of people and the flight of survivors from the inhabited centres – caused a quasi-total paralysis of the activities of production.

#### ELEMENTS OF LOCAL DEMOGRAPHY

The evaluation of the impact of the earthquake on the general demography of the hit area is difficult to determine. During the seventeenth century Calabria underwent a demographic collapse from 111301 registered fires (*i.e.* fiscal unities on a family basis) in 1595 to 81641 fires in 1669. Of considerable incisiveness on this backdrop were the pestilence epidemic of 1656, but most of all the serious social-economic problems that hit the region.

From an analysis of the numbers of victims reported by Capecelatro (1640) the higher rate of female mortality is noticeable: of 9581 deaths in total, 4594 (48%) were women, compared to 2999 (31.3%) men and 1978 (20.7%) children. This fact is certainly due to the hour in which the shock of 27 March (about 15:05 GMT) occurred, at that time most of the men were at work in the fields while the women were at home.

This general information is confirmed by the analysis of the death rate in one single village, Santo Stefano. The data on the inhabitants of this village in the years immediately before (1633) and after (1642) the earthquake reveal that the earthquake caused a much higher mortality rate for the women than for the men. In fact, 50.3% of all victims were women of between 16 and 55 years old, while only 16.3% of the victims were men of the same age. As for the children, the number of victims of those younger than 11 years was equal for both sexes, while of the children of 11 to 15 years died 5.8% girls and only 1.4% boys.

Maone (1966) hypothesised internal migrations of the population from some destroyed localities of the Tyrrhenian coastline (Carpanzano, Scigliano) to some centres on the Ionic side. This hypothesis was recently picked up again and developed on the basis of glottological and linguistic analyses (Chiodo *et al.*, 1996).

#### INSTITUTIONAL/ADMINISTRATIVE RESPONSE

On 12 April, the seriousness of the news that arrived at Naples made the viceroy nominate the councillor Ettore Capecelatro plenipotentiary for the Calabrian provinces. Capecelatro, who had at his disposal all the local offices and magistratures and had extraordinary judicial powers, transferred to Calabria in order to organise first aid to the population, for which he was given 8000 ducats. He was also supposed to make a detailed survey of the damage and to make up a complete account, indicating the most opportune remedies to avoid depopulation of the damaged areas and to foster the recovery of the local communities. Capecelatro completed his mission at the end of May 1638 and was already travelling back to Naples when the second destructive shock of 8 June occurred. The fiscal lawyers Di Palma and Rovito at, respectively, Calabria Ultra and Calabria Citra surveyed the damage of this shock in his place.

On the basis of the accounts made by Capecelatro the *Camera della Sommaria* divided the damaged localities into two categories. The first category contained all the localities granted a total exemption of fiscal payments for five years due to the destruction or mortality. This provi-

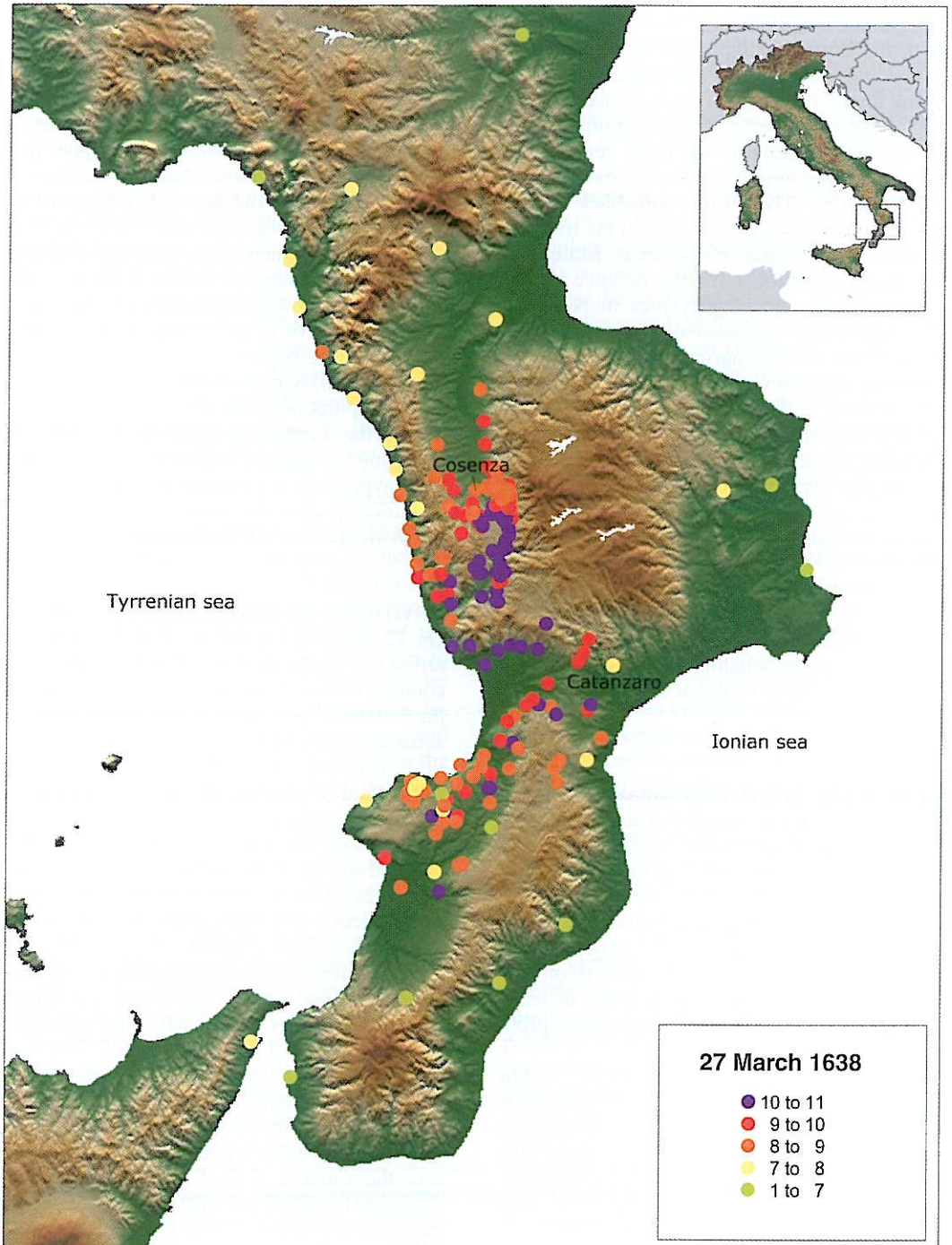


Fig. 1. Seismic scenario of the 27 March 1638 earthquake.

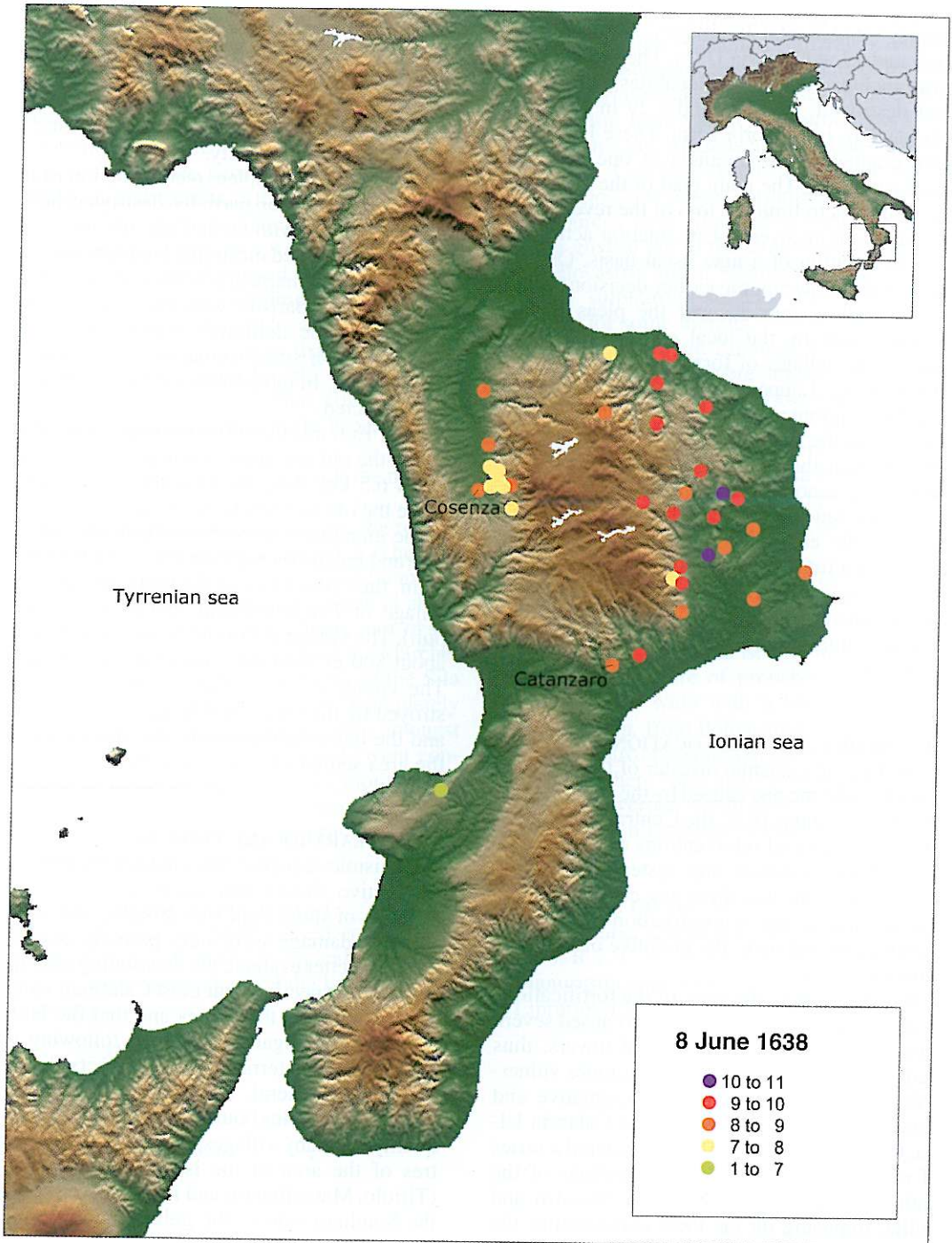


Fig. 2. Seismic scenario of the 8 June 1638 earthquake.

sion regarded in total 36 villages, 19 at Calabria Citra and 17 at Calabria Ultra. The second category included another 45 localities, defined as «not destroyed, but damaged»: 29 in Calabria Citra and 16 in Calabria Ultra. These localities were granted a postponement of one year for fiscal payments. The main goal of the Neapolitan court was to limit the loss of the revenue by favouring the recovery of production activities and the creation of a new fiscal basis. On the basis of this criterion the earlier decisions were revised, taking into account the pleas to the viceroy made by the local communities. For example, the villages of Torzano, Roccabernarda, Corno, Rose, Lappano, Pietrafitta and Celico, which were granted a limited immunity for only one year in the first decree, asked and partially obtained that their position be analysed again, taking into account the damage caused by the shock of 8 June and by the human losses subsequent to the earthquake, and insisting on the danger of a total depopulation of the hit areas. In the same way, in 1643, various villages asked and obtained exemption from a tax which that year was imposed on all the provinces of the Kingdom.

#### RECONSTRUCTIONS, RELOCATIONS

In the face of a seismic disaster of terrible proportions, like the one caused by the shocks of 27 March and 8 June 1638, the Central State limited itself to general interventions and directives and did not elaborate any systematic plan of intervention, nor was there any concrete initiative to finance the reconstruction which was therefore passed on to the initiative of the local lords or villages.

In this connection, the story of the fortifications is significant. The earthquake had caused severe damage to the system of coastal towers, thus making the local population even more vulnerable to Turkish raids. The representative and general deputy of the province of Calabria Ultra, Giovanni Tommaso Blanch, ordered a series of reconnaissances of the fortifications of the entire Tyrrhenian coast between Nicastro and Scilla, imposing on the local communities the cost of the repairs. In Calabria Citra the restoration of the towers of Diamante and Belvedere

Marittimo were to the charge of prince Carafa as they were situated on his feudal possessions. Also the restoration of the castle of Cosenza, where the provincial Court resided, was entrusted by the express wish of the court of Madrid to the inhabitants of the city.

Thus the almost complete reconstruction of the about 150 totally or partially destroyed buildings took place without any specific directives and with the limited means the populations could gather in the emergency following the earthquake. In comparison with the extent of the destruction, the definitive abandonments and the shiftings of site documented by the sources were limited. In most cases the same sites were reconstructed.

At Sant'Eufemia the surviving population abandoned the old site and reconstructed the village about 6.5 km away on a higher spot, also because the old site was flooded. At Feroleto, part of the inhabitants abandoned the destroyed village and reconstructed their houses on the lower plain, thus giving rise to the first nucleus of the village of Feroleto Piano (the present Pianopoli). The village of Grimaldi was reconstructed about 800 m from the ruins of the first village. The village of Zinga that was completely destroyed by the shock of 8 June, was abandoned and the few inhabitants who decided to stay in the area settled on a rise close-by.

#### MAJOR EARTHQUAKE EFFECTS

The seismic sequence was characterised by two destructive shocks that occurred with a time distance of more than two months, and where areas of damage were only partially overlapping. To better evaluate the devastating effects it needs to be specified that most Calabrian villages were built on the ranges and that the buildings leant one against the other, following the altimetry of the terrain which was very discontinuous. In general, the houses were built of stones and pebbles bound by mortar of very bad quality. In many villages, especially in the centres of the area of the isthmus of Catanzaro (Tiriolo, Marcellinara) and in those overlooking the Southern side of the gulf of Sant'Eufemia (Francavilla Angitola, Briatico, hamlets of Monteleone) the buildings were made out of bricks

of raw sun-dried clay. The houses, as Capece-latro observed, were economic but «very frail». This kind of building worsened the seismic effects.

The shock of 27 March 1638 occurred at about 15:05 GMT and hit a vast area of Central Calabria, at the border between the provinces of Catanzaro and Cosenza (fig. 1). More than 15 centres of the Tyrrhenian area, slightly north of the gulf of Sant'Eufemia were completely or almost completely destroyed. In more than 90 villages much of the building patrimony was destroyed, in more than 80 localities there were collapses and heavy damage that rendered numerous buildings uninhabitable. According to the official account more than 10 000 houses were destroyed and about 3000 became uninhabitable.

The damaged area extended towards the north to Maratea, where little damage was found, and towards the south to Messina, where the roof of the Cathedral came down. The shock was heavily felt on Sicily and lightly at Naples and Taranto.

The second shock occurred on 8 June at about 9:45 GMT and hit mostly the Ionic part of the region, in particular the localities of the Marchesato plain and of the eastern slopes of the Sila (fig. 2). Six villages were almost completely destroyed, another 15 inhabited centres, amongst which Catanzaro and Crotona, underwent considerable destruction, there was more heavy damage at Cosenza and in the surrounding hamlets, already devastated by the previous shock.

#### EFFECTS ON THE ENVIRONMENT

The earthquakes of 1638 caused considerable geomorphological and hydrological disruptions that, in some cases, changed the landscape permanently.

In consequence of the shock of 27 March at Bivona, Celico, Cosenza, Girifalco, Maida, Martirano, Scigliano and in the plain of the river Savuto large cracks and abysses opened up in the terrain, from which sulphurous gas sometimes came out. There were landslides at Martirano and Cosenza, where the top of the hill Pancrazio came down. Variations in the flow of the sources were signalled at Amantea, where water gushed out of the almost dried-up source of Catocastro, and at Sambiasi, where the flow of the sulphurous sources was considerably greater for some months.

On the plain of Sant'Eufemia, the hydrological disruptions, which were already accentuated before the earthquake, and the lowering of the ground caused the formation of a wide basin of stagnating water, which worsened the swamping and the diffusion of malaria in the area. The entire marshland of about 180 km<sup>2</sup> between the rivers Amato and Angitola was drained only in 1928 (Gambi, 1978).

Together with the shock of 27 March there was a withdrawal of the sea along the Pizzo coast for about 3700 m (2000 feet).

The shock of 8 June caused a movement of the terrain or a fissure of probably about 11 km, about 50 cm wide with a lowered border of about 75 cm, from Policastro (the present Petilia Policastro) passing San Giovanni in Fiore to the Sila. There were also fissures at Altilia and at Santa Severina, where close-by a landslide on the mountain Fuscaldo occurred.

#### STATISTICS OF THE TEXTS USED

Total number 259 of which: F 123, Fc 1, Fi 18, Fn 4, R 7, C 16, St 48, Bs 16, Ig 26.

Manuscript sources from: Archives 111, Libraries 15.