SPRINGER BRIEFS IN EARTH SCIENCES

Paola Albini

The Great 1667 Dalmatia Earthquake

An In-Depth Case Study

EXTRA MATERIALS
extras.springer.com

Springer

SpringerBriefs in Earth Sciences

More information about this series at http://www.springer.com/series/8897

Paola Albini

The Great 1667 Dalmatia Earthquake

An In-Depth Case Study

Springer

Paola Albini
Istituto Nazionale di Geofisica e
Vulcanologia
Milan
Italy

Additional material for this book (Full text of 67 selected items on the 6 April 1667 Earthquake) is available at http://extras.springer.com

ISSN 2191-5369 ISSN 2191-5377 (electronic)
SpringerBriefs in Earth Sciences
ISBN 978-3-319-16207-2 ISBN 978-3-319-16208-9 (eBook)
DOI 10.1007/978-3-319-16208-9

Library of Congress Control Number: 2015933816

Springer Cham Heidelberg New York Dordrecht London

Printed on acid-free paper

Springer International Publishing AG Switzerland is part of Springer Science+Business Media (www.springer.com)

Preface

"How did it come about that you decided to write this book?" Earlier this apparently innocent question may have elicited a simpler, anecdotal answer. Now close to completing the manuscript, I have decided to give a well-considered response.

This book is an attempt at describing the methodology that has developed to answer the questions posed by seismologists to historians about the earthquakes of the past. The main challenge faced by historical seismology, which is not the same as the history of earthquakes, is to reconstruct an earthquake, that is, its location, size and effects, by making use of the "non-seismological" data contained in the written records.

Instrumentally reliable data on earthquakes, depending on the area of the world, span no more than 50 years, too short a period to grasp effectively the movements and behaviour of the faults.

Can a historian reconstruct an earthquake? As the historian John Tosh wrote in his "The Pursuit of History", one has to pose the right questions for the historical sources to accurately answer and, in this specific case, allow the researcher to squeeze from the records as much of the seismological "juice".

The viewpoint adopted here is indisputably verging on the historical contribution (no magnitude nor epicentre is assessed), but every piece of information this book supplies is meant to ask of the sources the classical seismologist's questions: When did the earthquake occur? In which places was it felt? What was the intensity of the shaking at each place?

To answer such questions, putting it simply, has meant going back in time to the affected area by means of the surviving written records from that specific time and space. One has to take into account that many other events, natural or anthropogenic, may have substantially changed that space or destroyed the contemporary records. What is left to the researcher is a quest for testimonies, followed by a methodical and meticulous reconstruction of what actually happened at each individual affected place—as much like a jigsaw puzzle as a trip back in time—to get a "snapshot" of the moment when the earth shook and the aftermath.

The puzzling aspects are where the records are stored today, in which language they are written and last, but definitely important, what level of reliability can be

attributed to each testimony. The danger waiting for the researcher at each new finding is to forget the aim of the research and fall instead into filing a series of anecdotes, of which the historical sources on natural disasters are full. Such an approach is not useful to answer the seismologist's challenge, and it is outdated with respect to an effective preparedness to disaster. From history it should be learnt the ways to face and be resilient to natural phenomena, rather than to look for a scapegoat, be it God or a scientist, to burden with the fault and the suffering an earthquake caused.

The journey I have taken in the company of the men and women of historical Dalmatia in the year 1667 has had its bad and good moments, but has left me with an overall feeling that is a mixture of sadness and nostalgia, because the completion of this book means that I have to take leave from people and places I have learnt to love.

In the end, I wrote this book to share this experience with you, the readers. My hope is that you will enjoy reading it as much as I did enjoy the years of travelling and researching behind it.

October 2014 Paola Albini

Essential Glossary

The documents that have contributed to this book are written in such a variety of languages that a choice of which language to adopt for geographical and proper names was unavoidable and challenging. One obvious choice would have been the modern, Slavic names, as the English-speaking readers of this book would be more familiar for instance with Dubrovnik than Ragusa (not to be confused with the Sicilian town of the same name). Although the name Dubrovnik is not a recent linguistic invention, the town and the Republic discussed in this book, until its fall in 1808, were commonly known as Ragusa.

However, it is the aim of this book to "allow" each observer to tell his story, his observations of the earthquake and its aftermath in his own language and manner. Thus, the names and titles by which our witnesses identify themselves and others, and the town and place names that they were familiar with, as it stood in 1667, are used here.

For the benefit of the readers, here follow two lists: the first with the proper names, and the second with the most used geographical names, in their Italian and Slavic alternatives, respectively. Whenever it is required to refer to places not included in the list below, the modern names will be used, in their local language.

Throughout the book the first alternative, i.e. the Italian, will be adopted on the simple basis that this is the most used variant in the documents considered in this book on the 1667 earthquake. Also in Italian are the following officers' titles: Rettore e Consiglieri (Rector and Councilors) of the Republic of Ragusa; Provveditore Generale in Dalmatia et Albania (Governor-general), and Provveditore Estraordinario (Extraordinary Governor) of the Republic of Venice.

Names

Basegli (Bassegli) or Basilio/Basiljević/Vasilievi ć
Bobali/Bobaljević
Bona/Bunić

Giorgi/Đurđević
Gozze/Gucetić
Gradi/Gradić
Menze/Menčetić
Squadro/Skvadrović
Zamagna or Zamagnio/Zamanjić
Zmaievich/Zmajević

Geographical locations (the most recurring only)

Antivari/Bar
Barsecine/Brsečine
Bocche di Cattaro/Boka Kotorska
Breno/Srebreno
Budua/Budva
Calamotta/Koločep, island and place
Canali/Čilipi
Castel di Lastua/Petrovac na moru
Castel Novo/Herceg Novi
Cattaro/Kotor
Cobasc/Kobaš
Curzola/Korčula
Dolcino/Ulcinj
Giuppana/Šipan, island
Isola di Mezzo/Lopud, island and place
Meleda/Mljet, island
Ombla/Rijeka Dubrovačka-Mokošica
Orasciaz/Orašac
Osonik/Osojnik
Pastrovicchi/ Paštrovići
Perasto/Perast
Primorie/Podgora, Dubrovačko primorje
Ragusa/Dubrovnik
Ragusa Vecchia/Cavtat
Sabbioncello/Orebić
Santa Croce (di Gravosa)/Gruž
Saton/Zaton
Scoglieto di San Zorzi/Sveti Đorđe
Scoglieto della Madonna/Gospa od Škrpjela
Scutari/Shkodër
Slano/Slano
Spalato/Split

Stagno Grande/Ston or Veliki Ston
Stagno Piccolo/Mali Ston
Tarsteno/Trsteno
Zara/Zadar

Acknowledgments

As much as the Great 1667 Earthquake and its study has been an international affair, to acknowledge all the friends and colleagues who contributed to this endeavour asks for a similarly large-scale perspective. For this reason first comes a sincere and comprehensive thanks to all the highly valued colleagues, with whom I shared part of my research activity, from whom I learnt unforgettable lessons and who are too many to be mentioned without someone being left out.

Among them stand out some of my dearest friends, who indeed deserve to be acknowledged individually, because of their unselfish and warm support all through the penning of this book.

Starting from outside Europe, Nicolette S. Flint, Cape Town (South Africa), cheerily and willingly accepted to charge herself with the heavy burden of reading, checking and polishing my wobbling—or shaking—English. Though Nicky never said so, I am pretty sure she has lost her balance while reading some parts of the manuscript, but she held steady, and did not let me down, ever. Nicky was definitely the most meticulous and the least accommodating English editor I have met. Besides, drawing from her experience in the study of past earthquakes, she lavished a number of insights and sharp remarks on me, keeping me and the book on the right track. As friends do.

If this has been actually a research to which many languages contributed, without the expert knowledge and the constant support of Ina Cecić, Ljubljana (Slovenia), most of the novelty provided by the Croatian and Serbo-Croatian sources of information would have remained in the darkness of some library shelf, once more. Ina accepted also, out of her never failing good nature and because of her long experience in dealing with the earthquakes of the past, to take care of the manuscript review. As friends do.

We have shared many good moments and routes along many years of research on the earthquakes of the past centuries, and I could not have brought to completion this book without the highly knowledgeable and earnest support of Christa Hammerl, Vienna (Austria). She has been taking care of the German aspects of the research, and of me in my visits to the Österreichische Nationalbibliothek in Vienna. Above all, Christa wholeheartedly accepted to review my manuscript, and

she kept on encouraging me, especially in some hard and delicate times of the manuscript composition, by telling me how much she trusted what I was doing. As friends do.

I have been able to discuss what were still the shreds of an idea that had then to be fixed in a figure, with somebody who did listen to my thoughts, and then—quite literally—mapped them. This is what happened to me while working with Andrea Rovida, Milano (Italy). All the original figures and maps are the product of his skills as well as his experience in this discipline. This book would not have been possible without his kind and warm support. As friends do.

Along the years I spent researching the Great 1667 Earthquake, I was honoured to meet many experts in their respective fields. In particular, archivists and librarians of the many repositories I have visited throughout Europe, and which are listed in the book, have always been helpful and amicable. Although I have to admit I have often been a demanding visitor.

Finally, my sincere thanks go to Petra van Steenbergen, Springer, who trusted the project of this book since the beginning.

Indeed, this book owes its very existence to my beloved mother, and to all these who ever placed confidence in my humble self and in the journey I have embarked upon. May they always be favoured by a propitious wind!

January 2015 Paola Albini

Contents

Abbreviations

AGSim	Arquivo General de Simancas (General Archive of Simancas, Spain)
ASVe	Archivio di Stato di Venezia (State Archive of Venice, Italy)
	*Prov.Gen. Dalm.Alb.: Provveditore Generale in Dalmatia et Albania
	*Prov.Estr. Cattaro: Provveditore Estraordinario in Cattaro
DADu	Državni arhiv u Dubrovniku (State Archive of Dubrovnik, Croatia)
	*ACR: Acta Consilii Rogatorum
ÖNB	Österreichische Nationalbibliothek (National Library of Austria, Vienna)

Introduction

It was a bright cold day in April, and the clocks were striking thirteen.

As in the incipit of the novel "1984" by George Orwell, the story told in this book began when an earthquake struck on 6 April 1667, and severely affected a large area of the eastern coast of the Adriatic Sea.

This book provides an in-depth reconstruction of the consequences of this earthquake, made possible by introducing the readers to that context, distant in time and space, and then allowing them to observe the phenomenon through the eyes and words of the people who experienced it, or witnessed the aftermath of it, and took the initiative to share their emotions, experiences and observations.

"On the eve of the earthquake" (Chap. 1) has the scope of setting the scene for the reader by describing the geographical and historical scenario in which the earthquake happened, reviewing the existing studies and presenting how the research for the sources of information was approached. The main set of 114 documents, used throughout this book, was arranged in chronological order and is described in an ad hoc table at the end of the chapter. Each item is defined by its own date, place, type and author, and its archiving or cataloging position is fully referenced. A relevant quote of the retrieved material is supplied in its full text and original language in digital format in the Electronic Supplementary Material (http://extras.springer.com).

Who were the authors of the written reports? What was the motivations and perspectives that persuaded them to compose their accounts? The answers to these questions are discussed in the section devoted to "The Earthquake Observers" (Chap. 2). The mixed fortunes of these fifteen observers are recounted in some detail, with the purpose of pinpointing them and their accounts in time and space, in order to best extract the information useful in seismological terms. Special attention was devoted to how the news spread throughout Europe, as this provides a fundamental insight into the dependence of several published items on very few original sources, on which the interpretation of this earthquake had been quasi-exclusively based so far.

After having determined the exact time when "The earth began to quake" (Chap. 3), an overview is proposed of the actual earthquake observations, which, prior to this study, were scattered, and very often hidden, in many different types of sources in eight languages, mostly Latin and Italian, but also the seventeenth-century Dalmatian dialect, Croatian, English, French, Dutch and German. The earthquake's effects are presented place by place, in a geographical sequence from north to south, and in the context of the country they belonged to in the year 1667. Finally, the collected records are interpreted, and macroseismic intensities, according to the European Macroseismic Scale 98, are assigned at 37 locations.

For those who experienced and survived the "sudden accident" of the Great 1667 Earthquake, the epilogue was written by one of the protagonists of this book, Francesco Bobali. "Life won't be the same ever again".

The "Epilogue" of this book concludes that the scenario resulting from this research has substantially changed the seismological knowledge of this earthquake. Also, it is a heartfelt acknowledgment to these "earthquake observers" of the past, who made all this possible.

Chapter 1
On the Eve of the Earthquake

1.1 Setting the Stage

The region of Dalmatia, today territory of Croatia, is located in the eastern part of the Adriatic Sea, and stretches from the town of Karlobag (Carlopago in Italian) in the north to Cape Oštro at the tip of the Prevlaka Peninsula in the south. It is a narrow strip of land, dotted by a series of bays, with the Dinaric Alps in the background, and hundreds of islands along the coast. Bordering Dalmatia to the south is the Bay of Kotor (Boka Kotorska, and Bocche di Cattaro in Italian), an area that is today part of Montenegro.

In mid 17th century, the territory then recognized as Dalmatia together with the coastal part to its immediate south, then known as Albania, was controlled by three different states (Fig. 1.1):

1. The Republic of Ragusa, named after its capital, corresponding with modern day Dubrovnik, at the very heart of the Dalmatian region. After gaining independence from the Republic of Venice in the mid 14th century, the republic had an autonomous government, in power over a small portion of coastal Dalmatia, from the Neretva River estuary to the north to the northern entrance of Bocche di Cattaro to the south, and some of the islands immediately off the coast;
2. The "Serenissima" Republic of Venice, who had a high-ranking governor ("Provveditore Generale") taking care of the Venetian possessions in this strategic region on the route to the East. Venetian towns were located on the coast, and were jointly named "Dalmatia et Albania"; the "Provveditore" was seated in Zara (to the north, not in Fig. 1.1), while Cattaro was the most important Venetian stronghold in "Albania veneta" (Venetian Albania);
3. The Ottoman Empire, or "Sublime Porte", which ruled all over the Balkans and most of Hungary at the time, in a sense enveloping, from the mainland, the territories of the Republics of Venice and of Ragusa. The pressure of the Ottomans on the territories bordering with those pertaining to Venice and Ragusa is a topic incessantly discussed in the contemporary documents.

P. Albini, *The Great 1667 Dalmatia Earthquake*, SpringerBriefs in Earth Sciences,
DOI 10.1007/978-3-319-16208-9_1

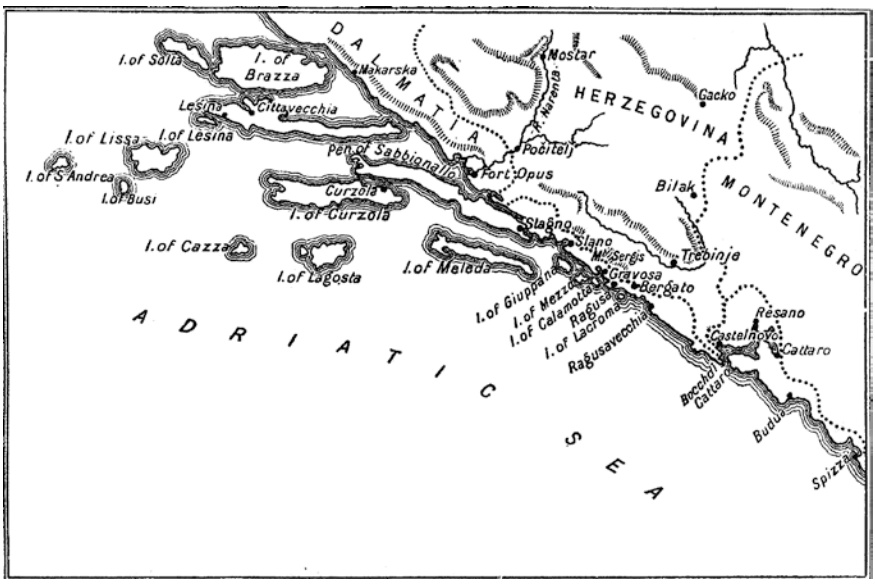

Fig. 1.1 The Republic of Ragusa and neighbouring countries around the year 1667 (Villari 1904, modified)

Moving to a less impersonal introduction to the geopolitical setting of the 1667 earthquake and the subsequent actions is entrusted to the contemporary written accounts of two travellers, who give us a greater insight to everyday life in Dalmatia. The visitors toured the area some years before the earthquake, between March and September 1663, in rapid succession, while performing their own duties. These two visitors were travelling for different reasons and scopes of interest, and were rooted in places and cultures that were vastly different. What these two people did have in common is that both were enthusiastic, and *ante litteram*, authors of travelogues, which have survived to this day.

The first visitor is the famous Ottoman Turkish traveller Evliya Çelebi (Istanbul 1611-Cairo 1685ca), whose "Book of Travels (Seyahathname)" is described as "probably the longest and most ambitious travel account by any writer in any language, and a key text for all aspects of the Ottoman Empire at the time of its greatest extension in the seventeenth century" (Dankoff and Kim 2011). Also, "Evliya's work defies easy categorisation. It encompasses history and geography, architecture both secular and sacred, plants, music, linguistics, medicine, folklore and ethnography […] and a host of miraculous and comic happenings" (Finkel 2011).

Sometime in March 1663, though the date should be taken with care, but in any case before 1667, Evliya Çelebi visited Hungary and most of the Balkans, including a stay of a few days for an official visit to Ragusa. Evliya's literary style results in such an excellent narrative that he succeeds in vividly depicting the town in just a few words, better than a whole guidebook, and especially in recreating the multifaceted cultural and political essence of the various people living side by side in the Dalmatia of that time.

"There are two Venediks on the face of the earth. One is called Bundukani Venedik – this is Venice the rebellious that has been at war with the Ottomans for the past twenty-five years. The other is this one, called Dobra-Venedik (i.e. Dubrovnik), a separate ancient community. To be sure, they are Christians, but they have translated the Gospel into Latin and recite it thus. […] the infidels of Dubrovnik have accepted peace [*note: by means of paying an annual tribute to the Porte, from the year 1447*] with the Ottomans to this very day. They are a bunch of foresightful and farsighted infidels who never do anything contrary to the treaty and whose envoys never fail to arrive (in Istanbul) at the beginning of every year, before any others. […] They are the wealthiest of all the infidel kings, but make a show of poverty and humility in order to protect their state, and craftily maintain peaceful relations with all other rulers. It [Dubrovnik/Ragusa] is a mighty fortress and thriving walled city of dressed stone built on a rocky site along the seashore. Within the walls the streets are so narrow and the houses so built up that there is not a single empty or idle space. Only there is a public square for executions and another for the marketplace, and also twenty-two courtyards of churches and monasteries. […] The houses here are layer upon layer, like those of Galata in Istanbul, built of brick masonry and covered with tiles of slate or tin. And there are myriads of bells, large and small, hanging on every house and every church. […] This city has numerous Armenians, Greeks, Jews, Persians and Franks; […] Being a place of security and a safe haven of Christendom, it is a very prosperous entrepôt." (Çelebi, 17th century).

The second visitor is Christoff Freyherr von Degenfeld (1641–1685), a professional soldier according to his family's tradition, at the service of the Republic of Venice in the final stage of the war against the Ottomans for the control of Crete (1645–1669). Von Degenfeld's travelogue is an unpublished manuscript, today stored in the Badische Landesbibliothek, Karlsruhe (Germany) (see on this manuscript Albini and Vogt 2008, also). It is an imposing volume of 800 folios ca, and has an informing title: "*Beschreibung der reyse so ich Christoff Freyherr Von Degenfeldt, Im Jahr Christi 1661 Von Dürnau aus angefangen, Undt im Jahr 1670 vollendet habe, auch was auf solchen Vorgangen, Undt sonsten Marckwürdiges zu sehen gewesen*" (Description of the journey that in the year 1661 I, Christoff Freyherr von Degenfeldt started from Dürnau, and finished in the year 1670, of what happened during such procedures and what else of remarkable I have seen) (Degenfeld 1670 *ca*).

Helped by a number of sketches made while travelling from Venice to the Venetian military post in Crete, von Degenfeld takes us to the places of the eastern Adriatic coast he visited in September 1663.

"Ragusa is a beautiful city, the most beautiful and biggest in Dalmatia. The city has beautiful houses and lanes, and is bordered by some fathoms of thick walls. The city has a harbour, and not too far away a fort on a cliff, all of these you can see in the sketch." (Degenfeld 1670 *ca*, fol.486a, translation from German courtesy of Christa Hammerl) (Fig. 1.2).

Evliya Çelebi and Christoff von Degenfeld introduced us to Dalmatia and Ragusa around the year 1663. Their descriptions should linger in our minds as we consider the veil of normality that was suddenly removed, only four years later.

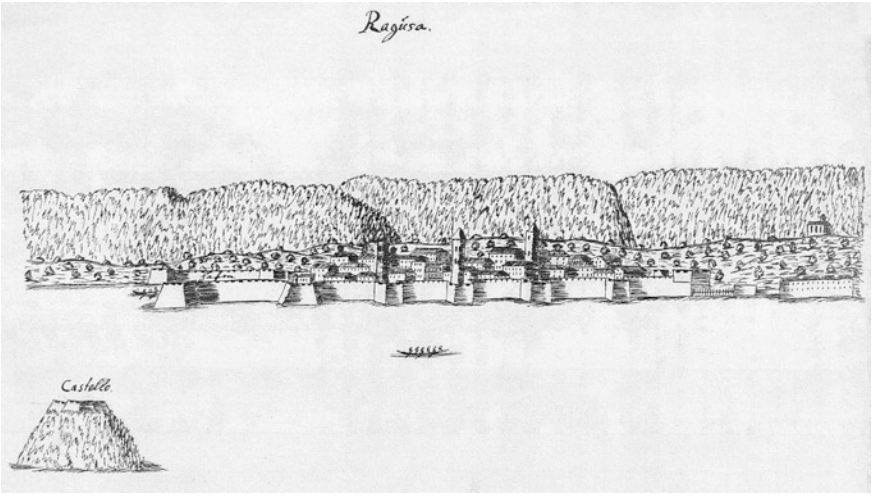

Fig. 1.2 The town of Ragusa in 1663 (Degenfeld 1670 *ca*)

They are acknowledged for sharing with us their unique experience of the region and its towns as they were, on the eve of the Great 1667 earthquake.

1.2 Previous Studies

There are quite a number of previous studies, ranging from the late 19th century to the present, which contain extensive, if not comprehensive, descriptions of the 1667 earthquake and its effects. Attention was devoted to ten studies, which are considered to be the most relevant to this research. They differ in scope and results: some benefit of the preceding studies; some incline to the historical rather than the seismological point of view; some are detailed and supply full texts of the historical records they used; while some consist of a summary and a set of seismological parameters.

Because the scope of the following overview is not to propose any kind of merit ranking of the ten selected contributions on the 1667 earthquake, the focus will be on aspects such as (i) which study was explicitly referred to by any other study (Fig. 1.3), and (ii) which original, coeval to the earthquake, historical records have been used and if, at least partly, such records have been supplied in full text (Table 1.1).

In his work on the past seismicity of Croatia, Kišpatić (1891) was the first to compile a comprehensive set of primary sources on the 1667 earthquake. However, he gave attention to one or the other source of information based on personal criteria and evaluations. As Kišpatić considered only a few documents concerning the territory of the Republic of Ragusa, and particularly those from the central government, he discarded them as useless to learn something relevant

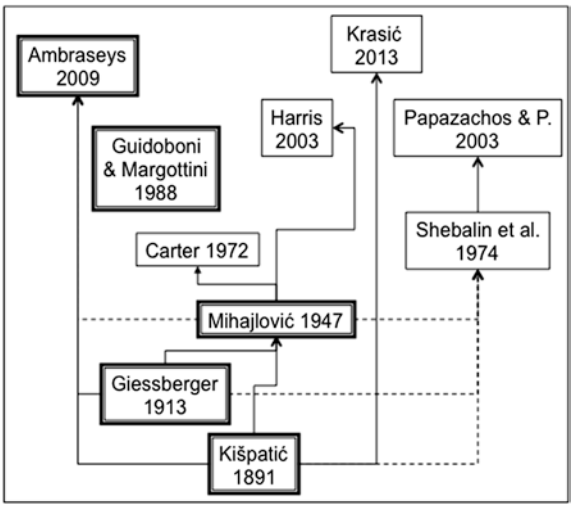

Fig. 1.3 Ten previous studies of the 1667 earthquake, from 1891 to 2013. *Arrows* point to the study that availed itself of one or more of the others by means of an explicit reference, a *dotted line* indicates a presumed connection, a *double line* frame those studies further considered, including Table 1.1

Table 1.1 Details on the five studies concerning the 1667 earthquake selected (see Fig. 1.3)

Study	Venetian sources referenced	Ragusan sources referenced	Full text
Kišpatić (1891)	Yes	No	Long excerpts, translated into Croatian
Giessberger (1913)	Yes	Yes	Long excerpts, translated into German
Mihajlović (1947)	Yes	Yes	No
Guidoboni and Margottini (1988)	Yes	No	In original languages (Italian and Latin)
Ambraseys (2009)	Yes	No	Long excerpts, translated into English

about the earthquake. He mostly relied on documents produced by Venetian officers, also regretting not to be able to give them all the space they deserved. Consequently, Kišpatić's description of the earthquake is (i) very detailed about the places inside the territory ruled by the Republic of Venice, (ii) quite generic about damage in Ragusa and the rest of the Republic of the same name, and (iii) largely inaccurate for most of the observations in the felt area (see Chap. 3).

The work by Kišpatić was referred to by Krasić (2013) for an overview of the 1667 earthquake effects, excluding the town of Ragusa.

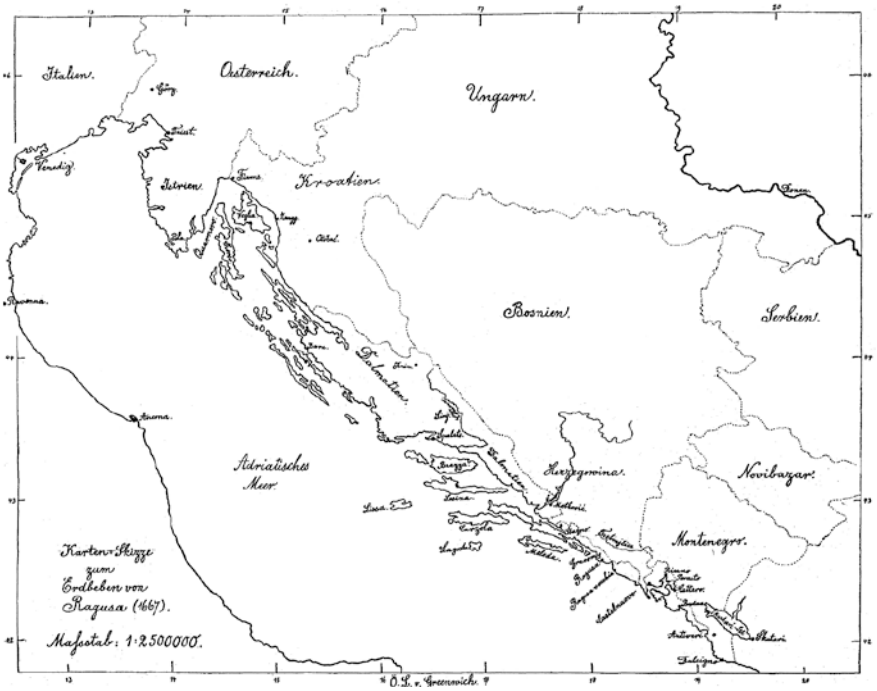

Fig. 1.4 The "1667 earthquake of Ragusa" according to Giessberger (1913)

Giessberger (1913) compiled a monographic essay on the 1667 earthquake. Starting from the stable ground prepared by his predecessor in 1891, he went back to retrieve all the records mentioned by Kišpatić. Giessberger was also the first to use and properly reference the documents produced by the officers of the Republic of Ragusa, today stored in the Državni arhiv u Dubrovniku (State Archive of Dubrovnik). His sketch of the area affected by the 1667 event (Fig. 1.4) was the first comprehensive map to be published relating to this earthquake.

In his work on the seismicity of the Adriatic coast from Ston to Dubrovnik, Mihajlović (1947) devoted one full chapter (III, pages 18–39) to the 1667 earthquake. As an introduction, he reviewed the contributions by Kišpatić (1891) and Giessberger (1913), with critical remarks on both of them, for the reason that they had given too much attention to the 1667 earthquake with respect to earthquakes that had occurred before and after. As a matter of fact, Mihajlović himself was one of the victims of the 'fatal attraction' exercised by the 1667 earthquake, on both historians and seismologists who stumbled on it. However, Mihajlović did enlarge the set of sources on the seismicity of historical Dalmatia considerably, and more specifically on the 1667 earthquake.

His analysis of the earthquake and of the damage inside the town of Ragusa was adopted by Carter (1972) in his history of Ragusa. The study by Mihajlović contributed also to the overview of the seismicity of Dubrovnik before the year

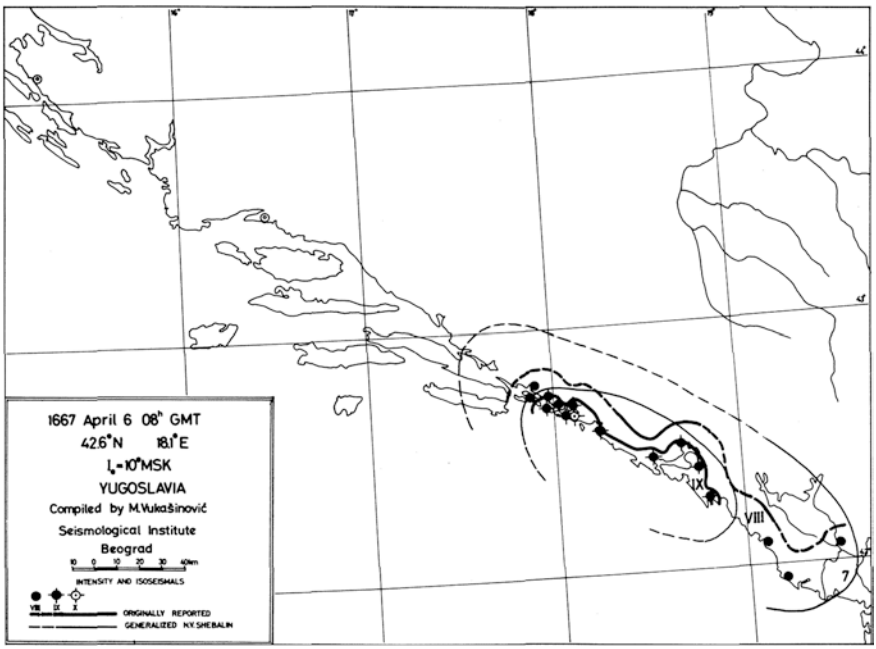

Fig. 1.5 Isoseismal map of the 1667 earthquake from Shebalin (1974)

1667 made by Harris (2003) in his book "Dubrovnik – A History". To describe the 1667 earthquake, especially inside the town of Ragusa, Harris himself tells that he drew upon the collection of sources by Samardžić (1960; more below on this book), and especially on the history of Ragusa "Veliki vek Dubrovnika" (1962). In the 10-pages chapter entitled "Death and resurrection", Harris focused his narrative on how the earthquake was experienced by people of different social classes, i.e. clergy, patriciate, "poorest classes", or origin, i.e. local vs foreigners.

The earthquake catalogue by Shebalin et al. (1974) relies upon Staikoff (1930) and Montandon (1953), both seismological compilations summarizing the earthquake effects in a few lines, and upon Cvijanović's unpublished catalogue (1971). The catalogue by Papazachos and Papazachou (2003) refers to Shebalin et al. (1974) as far as the earthquake parameters are concerned. Neither of these two catalogues, nor the sources they quote, make explicit reference to any previously published study (e.g. Giessberger 1913). It is worth mentioning that the first and earliest isoseismal map included by Shebalin (1974) in the "Atlas" for the Balkan region is that for the 1667 earthquake (Fig. 1.5).

The paper by Guidoboni and Margottini (1988) stands alone among the selected contributions on the 1667 earthquake shown in Fig. 1.3, because it does not reference any of them. The importance of this contribution consists of the inclusion of a collection of a rich set of documents, all specifically searched for in the Italian archives

of Venice, namely the "Museo Civico Correr" and the State Archive, and of Rome, the Secret Vatican Archive. The authors also supplied full texts of documents hitherto unused, difficult to consult, as well as unpublished. This makes their study a valuable reference for the collection of original sources on the 1667 earthquake.

The section on the 1667 earthquake in the volume "Earthquakes in the Mediterranean and the Middle East" by Ambraseys (2009) relies mainly upon the sources used by Kišpatić (1891). Ambraseys also mentions what is apparently the work by Mihajlović (1947), though dating it to 1950 (see the dotted line in Fig. 1.3). Ambraseys supplemented Kišpatić's sources with several contemporary press items and travellers' reports not mentioned by previous studies, as well as the Spanish documents from the "Archivo General" in Simancas (Spain), published by Rodriguez de la Torre (1993).

In his concluding remarks on the state of knowledge of the 1667 earthquake, after commenting that "this event is reported in a large number of contemporary sources", Ambraseys stressed an important point: "A problem with some of the early sources is that they are readily available only in Kišpatić's Serbo-Croat translation, and some of them […] are not easy to date. Furthermore, Kišpatić does not preserve the Italian names in his sources, making it difficult to 'match up' some of the towns in different accounts." (Ambraseys 2009).

1.3 Research Without Borders

To some extent, it is in the kind of comment as the one made by Ambraseys (2009) that lies the raison d'être of this essay, which could otherwise have been considered to be just another study, on what could easily be thought of the well-known, or, going to extremes, the "over-studied", 1667 earthquake.

The novelty of the research behind this study is that it grows from focused efforts towards retrieving as many written accounts as possible in their original version and pristine language. This approach is meant to avoid, as much as possible, substantial mistakes in the succeeding phases of interpretation of the historical records on the earthquake in seismological terms. Such mistakes may include the time and date of the earthquake, the identification of the name of the affected places when transposed from one language to another, though in a sense these are mistakes inherently connected with what might go "lost in translation". On the other hand, some of these are mistakes that can be avoided by simply refusing to use somebody's else summaries of the written records, on the basis that they are dissociated from their own contexts in time and space, and in some cases the excerpts seem rather to have been adjusted to fit in with the author's own idea of what happened on the occasion of the earthquake.

Understanding of both the geopolitical setting of the area where the earthquake of 1667 occurred, and the broader context in which the effects of its aftermath took place, is one of the basic aspects of the search for surviving records on the earthquake.

The possibility of both finding, and being able to access written accounts on what actually happened depends on whether there were settlements in the area at the time of the earthquake; how many there were, of what dimensions, town, village, or farm, and population size; but also their level of importance for the central government, strategic strongholds, or coastal and land routes of trade. While one could be relatively confident to retrieve first-hand testimonies on a famous town like Ragusa, where the literacy rate was high at that time, the chance of finding detailed accounts of the earthquake effects in the many villages located in the rest of the Republic of Ragusa decreases rapidly with distance from the capital city, strategic importance, and land usage. The same challenge applies to settlements inside the Venetian territories, with the exclusion of Cattaro, which, as already mentioned, was the most important Venetian stronghold in "Albania veneta", and a key location on the sea route from Venice and the Adriatic Sea to the Mediterranean.

The complex geopolitical situation reflects in the variety of languages adopted in the area affected by the 1667 event, with respect to both the place names, and the many official languages in use.

It is perhaps appropriate to resort to Evliya Çelebi, when he details the language groups spoken in the Mediterranean area in mid-seventeenth century:

"Their language [of the Venetians] is called Italian. Now the kings of Spain, France, Genoa, the grand-duchy of Livorno, Portugal, Dunkerque, Holland and England – all of their people are Franks […] But the above-mentioned Franks all speak Italian; although each one has its own special dialect and terminology, and they communicate with one another only with interpreters. The most eloquent is the language of the Frankish Venetians." (Çelebi, 17th century).

The official documents of the Republic of Ragusa were then written either in Latin or in Italian, and sometimes both languages are mixed in one document. Many south Slavic dialects, all to be referred to Croatian and Serbian, were spoken in the area at that time, and up to mid-19th century they are often referred to as Illyrian, from an ancient name for Dalmatia, or Dalmatian. Italian was also the language used by the officers of the ministries and departments of the Republic of Venice, and as Evliya Çelebi recalls, it was the lingua franca in the Mediterranean. Because of the language they are written in, the only documents which presented a challenge linguistically during this study were those in Turkish, produced by the Ottoman government, and they are not included.

The geographical and geopolitical position of Ragusa quite naturally resulted in making her a centre of trade and intelligence exchanges. Thus, merchants, diplomats, travellers and informers have left written accounts of their experiences; these records are in many different European languages, adding to the wide variety of the locally spoken and written languages already mentioned.

In the end, the search for documents on the effects of the 1667 earthquake became an international affair, and resulted in a "research without borders" approach with respect to the libraries and archives visited, as well as the languages in which the documentation collected is written in.

A series of visits between 2006 and 2013 allowed the author to consult, in person, quite a large number of manuscript and printed sources, currently stored in the following archives and libraries:

* *in Dubrovnik (Croatia)*
  - Državni arhiv u Dubrovniku (State Archive of Dubrovnik): documents in Latin, Italian, Croatian, and Dalmatian dialect
  - Library of the San Domenico Monastery: documents in Latin

* *in Venice (Italy)*
  - Archivio di Stato di Venezia (State Archive of Venice): documents in Latin and Italian;
  - Civico Museo Correr: documents in Italian

* *in London (UK)*
  - National Archives, Kew Gardens: documents in English
  - British Library: documents in English, French, Dutch, and German
* *in Paris (France)*
  - Bibliothèque Mazarine: documents in French

* *in Vienna (Austria)*
  - Österreichische Nationalbibliothek (National Library of Austria): documents in Italian.

Many other documents were retrieved in a full-text edition only, such as the aforementioned correspondence between the Republic of Ragusa and the King of Spain, published by Fernando Rodriguez de la Torre (1993).

It would be inexcusable not to mention here the paramount contribution by Radovan Samardžić (1960), of the Serbian Academy of Sciences (Belgrade). In pre-internet times, he must have made an enormous effort to get hold and transcribe in full as many original accounts on the 1667 earthquake as he could. This clearly emerges from the title of his 655-pages volume, which in its original French translation is "Raguse dans sa lutte pour l'existence après le grand tremblement de terre de 1667" (Ragusa and its struggle for existence after the great 1667 earthquake). Samardžić's collection of documents ends in 1670, and does not contain any interpretation of the earthquake, because this topic was later developed by him in a book on Ragusa in the 17th century (Samardžic 1962).

The amount of documentary material retrieved was quite overwhelming, and required a careful analysis and interpretation, in order to evaluate and extract the most out of each document in terms of its contribution to the seismological interpretation. To this purpose, in this book the material was arranged in a strict chronological order, and cross-referencing among the documents was used for undated items.

In addition to fixing the date when each item was produced, it was important to establish who the author was, the place where the item was actually written, and who was the addressee. Though the latter aspect was not always easy or possible to grasp, a short description of each record including as many elements as possible out of those just mentioned was assembled, and is proposed in the section "Item's description" of Table 1.2 (to the left). To complement the information with the today location of each item, the section "Item's position" of the same table (to the right), contains in case of manuscripts the unique reference to the repository, either archive or library, where the document is stored, or in case of published items the reference to the edition/s used.

The items' numbering, in the first column of Table 1.2, strictly depends on the chronological order established by means of the date when the record was produced, and throughout this book the records are recalled by their number. The last column to the right Table 1.2 supplies also their short reference.

To enrich the text of this book as well as to acknowledge and pay a tribute to those historians and seismologists who previously laboured over the documents on the 1667 earthquake, this book is supplemented with a digital appendix containing the full text version, in their original language, of 67 out of the 114 documents listed in Table 1.2. The symbol @ cross-refers to the full text of those record included in the Electronic Supplementary Material (http://extras.springer.com).

As the following chapters will illustrate, this organization made it possible to ascertain the flow of the information from and to the affected places, and reconstruct the full picture of the earthquake effects. In addition, the analysis of the records benefits from such an arrangement, in that it offers the opportunity to read and compare independent texts aimed at different audiences, to identify copies and translations, and eventually to grasp the similarities and contradictions that are a result of the writers' style, e.g. scope, focus, and details, and their intended audiences.

Eventually, the stage is set, and the 6th of April 1667 is rapidly approaching.

Table 1.2 Description and position of the items on the 6 April 1667 earthquake

No	Item's description			Item's position	
	Date	Place	Type and Author/s	Archiving or cataloging	Short reference
1	6 Apr 1667	Castel Novo	Letter by the "Agà" and Chieftains of Castel Novo, to Giacomo Loredan, Provveditore Estraordinario in Cattaro	ASVe, Senato, Dispacci, Prov.Gen. Dalm.Alb., n.331 (b.497). Enclosure [n.1] to Dispatch n.215	ASVe, 1667a
2 @	7 Apr 1667	Cattaro	Letter by Giacomo Loredan, Provveditore Estraordinario in Cattaro, to Caterino Cornaro, Provveditore Generale in Dalmatia et Albania, Zara	ASVe, Senato, Dispacci, Prov.Gen. Dalm.Alb., n.331 (b.497). Enclosure [n.2] to Dispatch n.210	ASVe, 1667b
3 @	7 Apr 1667	Cattaro	Letter by Giacomo Loredan, Provveditore Estraordinario in Cattaro, to the Senate, Venice	ASVe, Senato, Dispacci, Prov.Estr. Cattaro, n.469 (b.665-667)	ASVe, 1667c
4 @	[9 Apr] 1667	Calamotta	Copy of a letter by Pedro de Torres, archbishop of Ragusa, to a gentleman in Trani (Apulia, Italy)	DADu, Diplomata et acta, 17th cent, f. 5, n.549, f.1v. [no date, but 9 April, as confirmed by Doc#79]	DADu, 1667a
5	9 Apr 1667	Castel Novo	Letter from the captain, dizdar agas, agas and chieftains of Novi to Rettore and Consiglieri of the Republic of Ragusa	DADu, Diplomata et acta, 17th cent, n.1984. [not retrieved in original; see Samardžić 1960, p. 36]	DADu, 1667b
6 @	10 Apr 1667	Ragusa	Letter by Rettore and Consiglieri of the Republic of Ragusa to the abbot Stefano Gradi, Rome	DADu, Diplomata et acta, 17th cent., f. 14, n.1371, ff.1r-2v	DADu, 1667c
7	[10 Apr] 1667	Ragusa	Copy of Letter by Rettore and Consiglieri of the Republic of Ragusa to Pope Alessandro VII, Rome	DADu, Diplomata et acta, 17th cent, f. 5, n.547, ff.1r-1v. [mentioned in Doc#6]	DADu, 1667d

(continued)

Table 1.2 (continued)

No	Item's description			Item's position	
	Date	Place	Type and Author/s	Archiving or cataloging	Short reference
8 @	10 Apr 1667	Ragusa	Letter by Rettore and Consiglieri of the Republic of Ragusa to the King of Spain, Madrid	AGSim, Sección de Estado, Consejo de Estado, Don Gaspar De Tebes, Legajo 3562, Correspondencia de Venecia, 1667–1668, p. 48, ff.1v-r [from Rodriguez de la Torre 1993, pp. 82–83]	AGSim, 1667a
9 @	11 Apr 1667	Ragusa	Resolution of the Emergency Council of the Republic of Ragusa	DADu, ACR, ser.3, "Libro delli providimenti et terminationi", vol.115, ff.1r-1v	DADu, 1667e
10 @	11 Apr 1667	Curzola	Letter by Paulo Pasqualigo, Count of Curzola, to Caterino Cornaro, Provveditore Generale in Dalmatia et Albania, Zara	ASVe, Senato, Dispacci, Prov.Gen. Dalm.Alb., n.331 (b.497). Enclosure [n.1] to Dispatch n.212	ASVe, 1667d
11 @	11 Apr 1667	Zara	"Constituito", or report, by Vicenzo Giumeta to Caterino Cornaro, Provveditore Generale in Dalmatia et Albania, Zara	ASVe, Senato, Dispacci, Prov.Gen. Dalm.Alb., n.331 (b.497). Enclosure [n.1] to Dispatch n.210	ASVe, 1667e
12 @	12 Apr 1667	Zara	Dispatch by Caterino Cornaro, Provveditore Generale in Dalmatia et Albania to the Senate, Venice	ASVe, Senato, Dispacci, Prov.Gen. Dalm.Alb., n.331 (b.497). Dispatch n.210	ASVe, 1667f
13 @	12 Apr 1667	Zara	"Constituito", or report, by Canon Triffon Drago to Caterino Cornaro, Provveditore Generale in Dalmatia et Albania, Zara	ASVe, Senato, Dispacci, Prov.Gen. Dalm.Alb., n.331 (b.497). Enclosure [n.3] to Dispatch n.210	ASVe, 1667g
14 @	12 Apr 1667	Cuzzi	Letter by Voivoda Ivan Illicovich to Nicolò Bolizza in Cattaro	ASVe, Senato, Dispacci, Prov.Gen. Dalm.Alb., n.331 (b.497). Enclosure [n.1 to Dispatch n.217	ASVe, 1667h

(continued)

Table 1.2 (continued)

No	Item's description			Item's position	
	Date	Place	Type and Author/s	Archiving or cataloging	Short reference
15 @	13 Apr 1667	Zara	Dispatch by Caterino Cornaro Provveditore Generale in Dalmatia et Albania to the Senate, Venice	ASVe, Senato, Dispacci, Prov.Gen. Dalm.Alb., n.331 (b.497). Dispatch n.211	ASVe, 1667i
16 @	14 Apr 1667	Ragusa	Letter by Biagio Nicolò Squadro, canon of the archbishop Pedro de Torres, to his uncle [most probably in Venice]	Biagio Nicolò Squadro Letter [not retrieved in original; see Resetar 1893, pp. 30–32]	Squadro, 1667
17 @	14 Apr 1667	Canal di Zara	Dispatch by Caterino Cornaro Provveditore Generale in Dalmatia et Albania to the Senate, Venice	ASVe, Senato, Dispacci, Prov.Gen. Dalm.Alb., n.331 (b.497). Dispatch n.212	ASVe, 1667j
18 @	15 Apr 1667	Ragusa	Letter by Rettore and Consiglieri of the Republic of Ragusa to Caterino Cornaro Provveditore Generale in Dalmatia et Albania, Zara	ASVe, Senato, Dispacci, Prov.Gen. Dalm.Alb., n.331 (b.497). Enclosure [n.1] to Dispatch n.213	ASVe, 1667k
19	15 Apr 1667	Saraio	Letter by Marino Gozze, Ragusan ambassador in Sarajevo, Bosnia, to Rettore and Consiglieri of the Republic of Ragusa	DADu, Diplomata et acta, 17th cent., f. 52, n.1932. [not retrieved in original; see Samardžić 1960, p. 45]	DADu, 1667f
20 @	15 Apr 1667	Brindisi	Copy of a letter written in Brindisi to an unknown addressee in Lecce (Apulia, Italy)	DADu, Diplomata et acta, 17th cent., f. 5, n.549, f.1r	DADu, 1667g
21 @	[after 10 Apr] 1667	Ragusa	"Raguaglio", report, from a Venetian citizen to his brother in Venice	Museo Civico Correr, Venezia. Manuscript, Misc. Cicogna, 2858, ff.220r-v	MCCorrer, 1667

(continued)

Table 1.2 (continued)

No	Item's description			Item's position	
	Date	Place	Type and Author/s	Archiving or cataloging	Short reference
22 @	16 Apr 1667	Ragusa	Letter by Father Vitale Andriasci, "Minor Osservante" in Ragusa to Diodono Bosdari in Ancona	A) Lettera di Ragguaglio, nella quale si sente la totale distruzione della Città di Ragusa dal Terremuoto quest'anno li 6 Aprile a ore 14 li Mercoledì Santo Scritta dal molto Reverendo Padre Fra Vitale Andriasci da Ragusa de' Minori Osservanti al Molto Illustre Signore Diodono Bosdari in Ancona. In Ancona nella Stamperia Camerale MDCLXVII, Con licenza de' Superiori [see Adamović 1883, 20–25; Samardžic 1960, p. 46–49] B) DADu, Memoriae, ser. 40, ff.1r-2v, copy, 18th cent. C) ÖNB, Vienna, manuscript, Cod. Ser. 4498, ff.191r-193r	Andriasci, 1667
23	16 Apr 1667	Ragusa	Letter by Rettore and Consiglieri of the Republic of Ragusa to the Ragusan representatives (poklissar) at the Sublime Porte, Constantinople	DADu, 1667h. ADSMM, 17th cent., f. 38, n.1794/18, ff.1r-v	DADu, 1667h
24 @	18 Apr 1667	Gravosa	Letter by Francesco Bobali to Marco Basegli, Venice [partially translated into English, courtesy of Ina Cecić]	Francesco Bobali, Letter [not retrieved in original; see Samardžić 1960, pp. 49–52]	Bobali, 1667a
25 @	18 Apr 1667	Santa Croce	Dispatch by Caterino Cornaro, Provveditore Generale in Dalmatia et Albania to the Senate, Venice	ASVe, Senato, Dispacci, Prov.Gen. Dalm.Alb., n.331 (b.497). Dispatch n.213	ASVe, 1667l

(continued)

Table 1.2 (continued)

No	Item's description			Item's position	
	Date	Place	Type and Author/s	Archiving or cataloging	Short reference
26 @	19 Apr 1667	Brindisi	Copy of a letter by a Ragusan merchant in Brindisi, Gio. Veselicich	DADu, Diplomata et acta, 17th cent., f. 5, n.549, ff.1v-2r	DADu, 1667i
27 @	20 Apr 1667	Castel Novo	Letter by a Venetian informer to an unknown addressee in Perasto	ASVe, Senato, Dispacci, Prov.Gen. Dalm.Alb., n.331 (b.497). Enclosure [n.5] to Dispatch n.217	ASVe, 1667m
28	20 Apr 1667	Ragusa	Resolution of the Emergency Council of the Republic of Ragusa	DADu, ACR, ser. 3, vol. 115, ff.1v-3r	DADu, 1667j
29 @	21 Apr 1667	Cattaro	Letter by engineer Vicenzo Benaglio to Giacomo Loredan, Provveditore Estraordinario in Cattaro	ASVe, Senato, Dispacci, Prov.Gen. Dalm.Alb., n.331 (b.497). Enclosure [n.1] to Dispatch n.214	ASVe, 1667n
30 @	21 Apr 1667	Ragusa dai Lazzaretti	Letter by the archdeacon Bernardo Giorgi to the abbot Stefano Gradi, Rome	Bernardo Giorgi, Letter Excerpts in Cerva (1744, p. 347)	Giorgi, 1667a
31 @	[21 Apr] 1667	[Ragusa]	Letter by the archdeacon Bernardo Giorgi to the abbot Stefano Gradi, Rome	Bernardo Giorgi/Brnja Durdević, Letter. Excerpts in Cerva (1744, pp. 348–350)	Giorgi, 1667b
32 @	21 Apr 1667	Gravosa	Letter by Francesco Bobali in Ragusa to Marco Basegli, Venice [partially translated into English, courtesy of Ina Cecić]	Francesco Bobali, Letter [not retrieved in original; see Samardžić 1960, pp. 60–62]	Bobali, 1667b
33 @	21 Apr 1667	Cattaro	Dispatch by Caterino Cornaro, Provveditore Generale in Dalmatia et Albania to the Senate, Venice	ASVe, Senato, Dispacci, Prov.Gen. Dalm.Alb., n.331 (b.497). Dispatch n.214	ASVe, 1667o
34 @	21 Apr 1667	Cattaro	Letter by Giacomo Loredan, Provveditore Estraordinario in Cattaro, to the Senate, Venice	ASVe, Senato, Dispacci, Prov.Estr. Cattaro, n.469 (b.665-667)	ASVe, 1667p
35	21 Apr 1667	Ragusa	Resolution of the Emergency Council of the Republic of Ragusa	DADu, ACR, ser. 3, vol.115, f.3r	DADu, 1667k

(continued)

Table 1.2 (continued)

No	Item's description			Item's position	
	Date	Place	Type and Author/s	Archiving or cataloging	Short reference
36	22 Apr 1667	Ragusa	Letter by Francesco Bobali in Ragusa to Marco Basegli, Venice [partially translated into English, courtesy of Ina Cecić]	Francesco Bobali, Letter [not retrieved in original; see Samardžić, 1960, pp. 62–64]	Bobali, 1667c
37	22 Apr 1667	Venezia "in Pregadi"	Deliberation of the Senate of the Republic of Venice to the Provveditore Generale in Dalmatia et Albania	ASVe, Senato, Deliberazioni, Rettori, f. 68, March–August 1667	ASVe, 1667q
38 @	22 Apr 1667	Venezia "in Pregadi"	Deliberation of the Senate of the Republic of Venice to the Provveditore Generale in Dalmatia et Albania	ASVe, Senato, Deliberazioni, Rettori, Reg. 42, ff.46r-50r	ASVe, 1667r
39 @	22 Apr 1667	Venezia "in Pregadi"	Deliberation of the Senate of the Republic of Venice to the Provveditore Estraordinario in Cattaro	ASVe, Senato, Deliberazioni, Rettori, Reg. 42, ff.50r-v	ASVe, 1667s
40 @	22 Apr 1667	Venise	Letter from Venice	La Gazette Ordinaire d'Amsterdam, Monday 9 May 1667, n.19, 4 pp.	Gazette Ordinaire d'Amsterdam, 1667a
41	22 Apr 1667	Belgradi	Letter of Ragusan merchants, Belgrade, to Rettore and Consiglieri of the Republic of Ragusa	DADu, Diplomata et acta, 17th cent., f. 48, n.1858/20	DADu, 1667l
42 @	22 Apr 1667	Cattaro	Letter by engineers Vicenzo Benaglio and Tomaso Moretti to Caterino Cornaro, Provveditor General in Dalmatia et Albania	ASVe, Senato, Dispacci, Prov.Gen. Dalm.Alb., n.331 (b.497). Enclosure [n.8] to Dispatch n.217	ASVe, 1667t
43 @	22 Apr 1667	Cattaro	Dispatch by Caterino Cornaro, Provveditore Generale in Dalmatia et Albania to the Senate, Venice	ASVe, Senato, Dispacci, Prov.Gen. Dalm.Alb., n.331 (b.497). Dispatch n.215	ASVe, 1667u

(continued)

Table 1.2 (continued)

No	Item's description			Item's position	
	Date	Place	Type and Author/s	Archiving or cataloging	Short reference
44 @	23 Apr 1667	Ragusa "In Arce Revellini"	Resolution of the Emergency Council of the Republic of Ragusa	DADu, ACR, ser. 3, vol.115, ff.3v-5r	DADu, 1667m
45 @	23 Apr 1667	Venice	Letter by the English representative in Venice	National Archives, UK, State Papers, Venice, SP 99/46/204	Nat. Archives, UK, 1667
46 @	23 Apr 1667	Venezia	Letter by Marco Basegli and Luca Gozze, Ragusan representatives in Venice, to Rettore and Consiglieri of the Republic of Ragusa	DADu, Diplomata et acta, 17th cent., f. 61, n.2039/5, ff.1r-v	DADu, 1667n
47 @	23 Apr 1667	Ancona	Breve Ragguaglio delle Rovine cagionate dal Terremoto in Ragusa il di 6. Aprile 1667. per raconto di alcuni Signori Ragusei pervenuti in Ancona	Breve Ragguaglio delle Rovine cagionate dal Terremoto in Ragusa il di 6. Aprile 1667. per raconto di alcuni Signori Ragusei pervenuti in Ancona, il di 23. detto, etc. In Ancona, nella Stamperia Camerale MDCLXVII. Con Licenza de SS. Superiori [not retrieved in original; see Resetar, 1893, pp. 27–30; and Samardžić 1960, pp. 67–69]	Breve Ragguaglio, 1667
48	[23 Apr] 1667	[Venezia]	Informal message of the Ambassador of Savoia in Venice to Marco Basegli, Ragusan representative in Venice	DADu, Diplomata et acta, 17th cent., f. 61, n.2039/5, f.2r	DADu, 1667o
49 @	[after 23 Apr] 1667	[Ragusa]	Diary of Nicolò Bona	Nicolò Bona, Diary [dated on the basis of resolution of 23 April, see Doc#44; not retrieved in original; see Radonić 1939, III, 2, pp. 761–768. Another copy in ÖNB, Vienna, ms. 4530, ff.8v-12v]	Bona, 1667

(continued)

Table 1.2 (continued)

No	Item's description			Item's position	
	Date	Place	Type and Author/s	Archiving or cataloging	Short reference
50	[24 Apr] 1667	[Ragusa]	Letter by Nicola Gozze to the abbot Stefano Gradi, Rome	Nicola Gozze, Letter Excerpts in Cerva (1744, pp. 168–169)	Gucetic, 1667
51	24 Apr 1667	Ragusa	Resolution of the Emergency Council of the Republic of Ragusa	DADu, ACR, ser. 3, vol.115, ff.5v-6r	DADu, 1667p
52 @	24 Apr 1667	Stagno	Letter by Nicolo Bassegli to Rettore and Consiglieri of the Republic of Ragusa	DADu, Diplomata et acta, 17th cent, f. 73, n.2128	DADu, 1667q
53 @	24 Apr 1667	Castel Novo	Letter by a Venetian informer in Castel Novo received in Cattaro	ASVe, Senato, Dispacci, Prov.Gen. Dalm.Alb., n.331 (b.497). Enclosure [n.2] to Dispatch n.217	ASVe, 1667v
54 @	[24 Apr] 1667	[Scutari]	Letter by Igumno to Nicolò Bolizza, Cattaro	ASVe, Senato, Dispacci, Prov.Gen. Dalm.Alb., n.331 (b.497). Enclosure [n.3] to Dispatch n.217	ASVe, 1667w
55 @	24 Apr 1667	Venise	Letter from Venice	Gazette de France, 27 May 1667, n. 62, pp.489–500	Gazette de France, 1667a
56	25 Apr 1667	Ragusa	Resolution of the Emergency Council of the Republic of Ragusa	DADu, ACR, ser. 3, vol.115, f.6r	DADu, 1667r
57	25 Apr 1667	Ragusa	Letter by Rettore and Consiglieri of the Republic of Ragusa to the Ragusan representatives (poklissar) at the Porta	DADu, Diplomata et acta, 17th cent, f. 38, n.1794/19, ff.1r-2v	DADu, 1667s
58	25 Apr 1667	Mostar	Letter by Marino Gozze to the Rettore and Consiglieri of the Republic of Ragusa	DADu, Diplomata et acta, 17th cent, f. 52, n.1932/21, ff.1r-3v	DADu, 1667t
59 @	26 Apr 1667	Ragusa	Rettore and Consiglieri of the Republic of Ragusa to Louis XIV of France	Affaires Étrangers, Raguse, vol. I, f.18 [not retrieved in original; see Radonić 1939, pp. 705–706; also in Samardžić 1960, pp. 76–77]	Aff. Etr., 1667a

(continued)

Table 1.2 (continued)

No	Item's description			Item's position	
	Date	Place	Type and Author/s	Archiving or cataloging	Short reference
60 @	26 Apr 1667	Castel Novo	Letter of a Venetian informer in Castel Novo to Francesco Bucchia	ASVe, Senato, Dispacci, Prov.Gen. Dalm.Alb., n.331 (b.497). Enclosure [n.6] to Dispatch n.217	ASVe, 1667x
61	27 Apr 1667	Ancona	"Raguaglio del terremoto di Ragusa cavato dal racconto di persone da quela città capitate in Ancona […]"	DADu, Diplomata et acta, f. 5, n.548, ff.1r-v	DADu, 1667u
62	[27 Apr] 1667	Amsterdam	Account of Iacob van Dam to the States General, The Hague	Relaes, Ofte generale beschrijvinge vande Voyagie, gedaen door den Heer Iacob van Dam, aengestelde Consul, Heeren Staten Generael der Vereenighde Nederlanden […] 't Amsterdam, Gedruckt by Johannes vanden Bergh, bezijden't Stadt-huys, Anno 1667, 15 pp. British Library, London, UK, 1295.c.23	Relaes, 1667
63	28 Apr 1667	Ragusa	Resolution of the Emergency Council of the Republic of Ragusa	DADu, ACR, ser. 3, vol.115, f.7v-8r	DADu, 1667v
64 @	[28 Apr] 1667	[Castel Novo]	Letter of the informer Ivan Carambassà to Francesco Buchia, Cattaro	ASVe, Senato, Dispacci, Prov.Gen. Dalm.Alb., n. 331 (b.497). Enclosure [n.4] to Dispatch n.217	ASVe, 1667y
65 @	29 Apr 1667	Venise	Letter from Venice on the earthquake	La Gazette Ordinaire d'Amsterdam, Monday 16 May 1667, n.20, 4 pp.	Gazette Ordinaire d'Amsterdam, 1667b

(continued)

Table 1.2 (continued)

No	Item's description			Item's position	
	Date	Place	Type and Author/s	Archiving or cataloging	Short reference
66 @	[29 Apr] 1667	Ragusa	"Carta" (letter) by Iuan de Rigo, secretary of the Dutch Ambassador, in Ragusa at the time of the earthquake	Gazeta Nueva de los Sucessos políticos y militares de la Mayor Parte de la Europa […] ruyna de la ciudad de Ragusa, sucedida el Miercoles 6. de Abril deste presente Año de 1667, no. 1. Granada. British Library, London, UK, 1323.g.1.(17)	Gazeta Nueva, 1667
67	30 Apr 1667	Ragusa	Rettore and Consiglieri of the Republic of Ragusa to M. Sorkocević-Bobaljević, Ragusan representative in Venice	DADu, Diplomata et acta, 17th cent, f. 68/4, no. 2095, cc.154r-v	DADu, 1667w
68	30 Apr 1667	Venetia	Marco Basegli and Luca Gozze to Rettore and Consiglieri of the Republic of Ragusa	DADu, Diplomata et acta, 17th cent, f. 61, no. 2039/6	DADu, 1667x
69	30 Apr 1667	Venecia	Letter by the Spanish Ambassador Don Gaspar De Tebes in Venice to the King of Spain	AGSim, Sección de Estado, Consejo de Estado, Don Gaspar De Tebes, Legajo 3562, Correspondencia de Venecia, 1667–1668, p. 38, f.2 [from Rodriguez de la Torre 1993, p. 81]	AGSim, 1667b
70 @	30 Apr 1667	Venetia	Letter of a Vedoa in Venice to Hugues de Lionne, foreign secretary of France	Affaires Étrangers, Venise, vol. 88, fol. 42 [not retrieved in original; see Radonić 1939, pp. 707–708]	Aff. Etr., 1667b
71	30 Apr 1667	Roma	Letter by the abbot Stefano Gradi in Rome to Rettore and Consiglieri of the Republic of Ragusa	Stefano Gradi, Letter - DADu, Diplomata et acta, 17th cent., f.8, n.803/1 - Excerpts in Radonić (1939, pp. 708–714)	Gradi, 1667a

(continued)

Table 1.2 (continued)

No	Item's description			Item's position	
	Date	Place	Type and Author/s	Archiving or cataloging	Short reference
72 @	[no date, but end of April] 1667	Venize	"Relation extraite d'une Lettre ecritte de Venize a mons.r Charpentier Banquier par mons.r Hardin, qui etoit a Raguze lors quelle à etè ruineè"	Bibliothèque Mazarine, Paris, manuscript, A15426, n.36, ff.1r-3r	Hardin, 1667
73 @	[end of Apr] 1667	Venezia	Relatione dell'horribile terramoto seguito nella città di Ragusa, et altre della Dalmatia, et Albania il giorno delli 6. Aprile 1667	A) Relatione dell'horribile terramoto seguito nella città di Ragusa, et altre della Dalmatia, et Albania il giorno delli 6. Aprile 1667. In Venetia, Appresso Gio. Pietro Pinelli, Con Licenza de' Superiori, 2 ff., British Library, London, UK, 444.b.20.(7.) B) ÖNB, Vienna, Manuscript, Cod. Ser. 4498, ff.189r-190r	Relatione, 1667
74 @	[end of Apr] 1667	[Paris]	Relation de l'horrible tremblement de terre arrivé en la Ville de Raguse, & autres lieux de la Dalmatie & de l'Albanie, le 6. d' Avril 1667	Relation de l'horrible tremblement de terre arrivé en la Ville de Raguse, & autres lieux de la Dalmatie & de l'Albanie, le 6. d'Avril 1667 British Library, London, UK, T.1589.(32.)	Relation, 1667
75 @	[end of Apr] 1667	London	A true Relation of the terrible earthquake which happened at Ragusa	A true Relation of the terrible earthquake which happened at Ragusa and several other cities in Dalmatia and Albania the Sixth of April 1667. As we have it in a particular Account from Venice. Published in Authority. In the Savoy [London], Printed by Tho: Newcomb, MDCLXVII. British Library, London, UK, 444.a.35	A true Relation, 1667

(continued)

Table 1.2 (continued)

No	Item's description			Item's position	
	Date	Place	Type and Author/s	Archiving or cataloging	Short reference
76 @	1 May 1667	Cattaro	Survey by engineers Vicenzo Benaglio and Tomaso Moretti	ASVe, Senato, Dispacci, Prov.Gen. Dalm.Alb., n.331 (b.497). Enclosure [n.9] to Dispatch n.217	ASVe, 1667z
77 @	2 May 1667	Cattaro	Dispatch by Caterino Cornaro, Provveditore Generale in Dalmatia et Albania to the Senate, Venice	ASVe, Senato, Dispacci, Prov.Gen. Dalm.Alb., n.331 (b.497). Dispatch n.216	ASVe, 1667aa
78	2 May 1667	Cattaro	Dispatch by Caterino Cornaro, Provveditore Generale in Dalmatia et Albania to the Senate, Venice	ASVe, Senato, Dispacci, Prov.Gen. Dalm.Alb., n.331 (b.497). Dispatch n.217 Excerpts in Ljubić (1883, pp. 45–47)	ASVe, 1667bb
79 @	2 May 1667	Ancona	"Racconto della navigazione di Monsignor Arcivescovo colle Monache di Ragusa, del loro ricevimento in Ancona li 2 maggio 1667, e di altri successi del già narrato Terremmoto"	Racconto della navigazione di Monsignor Arcivescovo colle Monache di Ragusa, del loro ricevimento in Ancona li 2 maggio 1667, e di altri successi del già narrato Terremmoto. In Ancona nella Stamperia Camerale, con licenza dei SS. Superiori Not retrieved in original, text as in: A) Cerva (1744, pp. 174–183) [also in Adamović 1883, pp. 26–29; and in Samardžić 1960, pp. 29–33] B) ÖNB, Vienna, manuscript, Cod. Ser. 4498, ff.193r-196v	Racconto, 1667
80 @	3 May 1667	Cobasc	Letter by Francesco Bobali in Ragusa to Marco Basegli, Venice [partially translated into English, courtesy of Ina Cecić]	Francesco Bobali, Letter [not retrieved in original; see Samardžić 1960, pp. 84–87]	Bobali, 1667d

(continued)

Table 1.2 (continued)

No	Item's description			Item's position	
	Date	Place	Type and Author/s	Archiving or cataloging	Short reference
81	4 May 1667	Venise	Letter from Venice	La Gazette Ordinaire d'Amsterdam, Monday 23 May 1667, n.23, 4 pp.	Gazette Ordinaire d'Amsterdam, 1667c
82	5 May 1667	Venezia	Deliberation of the Senate of the Republic of Venice to the Provveditore Estraordinario in Cattaro	ASVe, Senato, Deliberazioni, Rettori, n.285, March–August 1667	ASVe, 1667cc
83	5 May 1667	Venetia	Deliberation of the Senate in Venice, to the Rettore and Consiglieri of the Republic of Ragusa	DADu, Diplomata et acta, 17th cent., f. 2, n.94 [on parchment]	DADu, 1667y
84	5 May 1667	Venezia, "in Pregadi"	Deliberation of the Senate of the Republic of Venice to Giacomo Loredan, Provveditore Estraordinario in Cattaro	ASVe, Senato, Deliberazioni, Rettori, Reg. 42, ff.68v-69v	ASVe, 1667dd
85	5 May 1667	Venezia, "in Pregadi"	Deliberation of the Senate of the Republic of Venice to Caterino Cornaro, Provveditore Generale in Dalmatia et Albania	ASVe, Senato, Deliberazioni, Rettori, Reg. 42, ff.69v-71v	ASVe, 1667ee
86	6 May 1667	Adrenopoli	Letter of the ambassadors Marzolizza Zamagnio and Matteo Menze, Edirne, to Rettore and Consiglieri of the Republic of Ragusa	DADu, Diplomata et acta, 17th cent, f. 89, no. 2214/2, ff.1r-4v	DADu, 1667z
87	7 May 1667	Romae	Letter by Pope Alessandro VII to the Rettore and Consiglieri of the Republic of Ragusa	Pope Alessandro VII, Letter [not retrieved in original; see Radonić 1939, pp. 715–716. Also, in Theiner, 1875, II, p. 191]	Pope Alexandre VII, 1667
88	[ante 8 May] 1667	Zuppa	Plea of the inhabitants of Zuppa to the Senate, Venice	ASVe, Senato, Dispacci, Prov.Estr. Cattaro, n.469 (b.665-667). Enclosure [n.1] to 8 May letter by Giacomo Loredan	ASVe, 1667ff

(continued)

Table 1.2 (continued)

No	Item's description			Item's position	
	Date	Place	Type and Author/s	Archiving or cataloging	Short reference
89 @	[ante 8 May] 1667	Zuppa	Plea of the inhabitants of Zuppa to the Provveditore Generale in Dalmatia et Albania	ASVe, Senato, Dispacci, Prov.Gen. Dalm.Alb., n.331 (b.497). Enclosure [n.1] to Dispatch n.220	ASVe, 1667gg
90 @	8 May 1667	Cattaro	Letter by Giacomo Loredan, Provveditore Estraordinario in Cattaro to the Senate, Venice	ASVe, Senato, Dispacci, Prov.Estr. Cattaro, n.469 (b.665-667)	ASVe, 1667hh
91	8 May 1667	Venise	Letter from Venice	Gazette de France, 10 June 1667, n.68, pp. 537–548.	Gazette de France, 1667b
92	[ante 9 May] 1667	Cattaro	Plea of the inhabitants of Cattaro	ASVe, Senato, Dispacci, Prov.Gen. Dalm.Alb., n.331 (b.497). Enclosure [n.1] to Dispatch n.219	ASVe, 1667ii
93 @	[ante 9 May] 1667	Cattaro	Plea of the inhabitants of Cattaro	ASVe, Senato, Dispacci, Prov.Gen. Dalm.Alb., n.331 (b.497). Enclosure [n.1] to Dispatch n.220	ASVe, 1667jj
94	9 May 1667	Cattaro	Dispatch by Caterino Cornaro, Provveditore Generale in Dalmatia et Albania to the Senate, Venice	ASVe, Senato, Dispacci, Prov.Gen. Dalm.Alb., n.331 (b.497). Dispatch n.218	ASVe, 1667kk
95	9 May 1667	Cattaro	Dispatch by Caterino Cornaro, Provveditore Generale in Dalmatia et Albania to the Senate in Venice	ASVe, Senato, Dispacci, Prov.Gen. Dalm.Alb., n.331 (b.497). Dispatch n.219	ASVe, 1667ll
96	9 May 1667	Cobasc	Letter by Francesco Bobali in Ragusa to Marco Basegli, Venice [partially translated into English, courtesy of Ina Cecić]	Francesco Bobali, Letter [not retrieved in original; see Samardžić 1960, pp. 89–91]	Bobali, 1667e
97	9 May 1667	Adrenopoli	Letter of the ambassadors Marzolizza Zamagnio and Matteo Menze, Edirne, to Rettore and Consiglieri of the Republic of Ragusa	DADu, Diplomata et acta, 17th cent, f. 89, n.2214/3, 1r-2r	DADu, 1667aa

(continued)

Table 1.2 (continued)

No	Item's description			Item's position	
	Date	Place	Type and Author/s	Archiving or cataloging	Short reference
98 @	14 May 1667	Firenze	Letter by the Grand Duke of Tuscany Ferdinando II de' Medici to the Rettore and Consiglieri of the Republic of Ragusa	DADu, Diplomata et acta, 17th cent,, f. 61, n.2010	DADu, 1667bb
99	16 May 1667	Cobasc	Letter by Francesco Bobali in Ragusa to Marco Basegli, Venice [partially translated into English, courtesy of Ina Cecić]	Francesco Bobali, Letter [not retrieved in original; see Samardžić 1960, pp. 95–97]	Bobali, 1667f
100	18 May 1667	Ragusa	Letter by the Rettore and Consiglieri of the Republic of Ragusa to Cardinal Chigi, Rome	DADu, Diplomata et acta, 17th cent,, f. 5, no. 550, f. 1-2v	DADu, 1667cc
101	18 May 1667	Ragusa	Letter by Rettore and Consiglieri of the Republic of Ragusa to the King of Spain	AGSim, Sección de Estado, Consejo de Estado, Don Gaspar De Tebes, Legajo 3562, Correspondencia de Venecia, 1667–1668, p. 64 [from Rodriguez de la Torre 1993, p. 83]	AGSim, 1667c
102 @	20 May 1667	Torino	Letter by Emanuele di Savoia to Rettore and Consiglieri of the Republic of Ragusa	DADu, Diplomata et acta, 17th cent, f. 68/4, n.2095, f.162	DADu, 1667dd
103	22 May 1667	Spalato	Dispatch by Caterino Cornaro, Provveditore Generale in Dalmatia et Albania to the Senate, Venice	ASVe, Senato, Dispacci, Prov.Gen. Dalm.Alb., n.331 (b.497). Dispatch n.220	ASVe, 1667mm
104	22 May 1667	Spalato	Dispatch by Caterino Cornaro, Provveditore Generale in Dalmatia et Albania to the Senate, Venice	ASVe, Senato, Dispacci, Prov.Gen. Dalm.Alb., n.331 (b.497). Dispatch n.221	ASVe, 1667nn
105	27 May 1667	Cattaro	Letter by Giacomo Loredan, Provveditore Estraordinario in Cattaro to the Senate, Venice	ASVe, Senato, Dispacci, Prov.Estr. Cattaro, n.469 (b.665-667)	ASVe, 1667oo
106 @	28 May 1667	Ragusa	Letter by the archdeacon Bernardo Giorgi to the abbot Stefano Gradi in Rome	Bernardo Giorgi, Letter Excerpts as in Cerva (1744, pp. 350–351)	Giorgi, 1667c

(continued)

Table 1.2 (continued)

No	Item's description			Item's position	
	Date	Place	Type and Author/s	Archiving or cataloging	Short reference
107 @	28 May 1667	Ragusa	Letter by Rettore and Consiglieri of the Republic of Ragusa to the Republic of Lucca	DADu, Diplomata et acta, 17th cent, f.8, no.803 [not retrieved in original; see Samardžić 1960, pp. 109–110]	DADu, 1667ee
108 @	29 May 1667	Vienna	Letter by Francesco de Gondola, Ragusan representative in Vienna, to Rettore and Consiglieri of the Republic of Ragusa	Francesco de Gondola, Letter [not retrieved in original; see Samardžić 1960, pp. 114–115]	Gondola, 1667
109	3 June 1667	Ragusa	Resolution of the "Consilium Rogatorum" (Senate) of the Republic of Ragusa	DAD, ACR, ser. 3, vol. 114, ff.55r-58v	DADu, 1667ff
110 @	8 June 1667	Madrid	The Spanish Council of State to the Republic of Ragusa	AGSim, Sección de Estado, Consejo de Estado, Don Gaspar De Tebes, Legajo 3562, Correspondencia de Venecia, 1667–1668, p. 37, ff.1r-3r [from Rodriguez de la Torre 1993, pp. 81–82]	AGSim, 1667d
111	10 June 1667	Ragusa	Resolutions of the Great Council of the Republic of Ragusa	DADu, Acta Consilii Maioris, ser.8, vol. 44, 1665–1668, ff.196r-v	DADu, 1667gg
112 @	early summer 1667	Roma	"Discorso sopra lo stato della Repubblica di Ragusa dopo il terremoto et incendio della Città […]"	Stefano Gradi, Discorso sopra lo stato della Repubblica di Ragusa dopo il terremoto et incendio della Città e di quello, che sarebbe da fare in quella contingenza in ordine al sollievo di essa Excerpts in Radonić (1939, p. 721–756)	Gradi, 1667b

(continued)

Table 1.2 (continued)

No	Item's description			Item's position	
	Date	Place	Type and Author/s	Archiving or cataloging	Short reference
113 @	25 June 1667	Tournay	Letter by Louis XIV of France to the Rettore and Consiglieri of the Republic of Ragusa	DADu, Diplomata et acta, 17th cent, f. 2, n.96 [not retrieved in original; see Samardžić 1960, p. 140; Radonić 1939, pp. 757–758]	DADu, 1667hh
114	8 August 1667	Firenze	Letter by Francesco Redi in Florence to Stefano Gradi, Rome	Francesco Redi, Letters Redi (1795, p. 85)	Redi, 1667

Dates and remarks between square parentheses are by the author. Items' numbering follows the chronological order established by means of the date when the item was produced. Items are referred to in the text by their number. The symbol @ cross-indicates that the full text of that item is included in the Electronic Supplementary Material on http://extras.springer.com

References

17 century sources

Degenfeld von Ch. (1670 *ca.*) Beschreibung der Reise so ich Christoff Freyherr von Degenfeldt im Jahr Christi 1661 von Dürnau aus angefangen, und im Jahr 1670 vollendet habe, aus was auf solchen Vorgängen, undt sonstens Marckwürdiges zu sehen gehabt. *Manuscript*, Kraichgau 3, Badische Landesbibliothek, Karlsruhe, xix + 932 folios.

Evliya Çelebi, 17th century. An Ottoman Traveller, Selections from the Book of Travels of Evliya Çelebi, edited and translated by Robert Dankoff and Sooyong Kim, Eland, 2011, 482 pp.

Modern studies

Adamović V., 1883. O trešnjama grada Dubrovnika. Biblioteka za povijest Dalmatinsku, Dubrovnik, 7, 15–19.

Albini P. and Vogt J., 2008. A glimpse into the seismicity of the Ionian Islands between 1658 and 1664. In: J. Fréchet, M. Meghraoui, M. Stucchi (eds), Historical Seismology Interdisciplinary studies of past and recent earthquakes, "Jean Vogt in memoriam", 43–91.

Ambraseys N., 2009. Earthquakes in the Mediterranean and Middle East: A Multidisciplinary Study of Seismicity up to 1900. Cambridge University Press, 968 pp.

Carter F.W., 1972. Dubrovnik (Ragusa), A Classic City-state. Seminar Press, London and New York, 710 pp.

Cerva S., 1744. Sacrae Metropolis Ragusinae. Manuscript, Library of the Dominican Monastery, Dubrovnik, 34-IX-6, V.

Finkel C., 2011. Traveller's Tales. History Today, vol. 61, 11, 33–38.

Giessberger H., 1913. Das Ragusanische Erdbeben von 1667. Münchener Geographische Studien, München, vol. 28, 74 pp.

Guidoboni E. and Margottini C., 1988. The 6th April 1667 dalmatian earthquake in the Italian historical sources. In: C. Margottini and L. Serva (eds.), Proc. IAEA Workshop on historical seismicity of Central-Eastern Mediterranean Region, Roma, 27-29 October 1987, pp. 65–93.

Harris R., 2003. Dubrovnik. A history. Saqi, London, 503 pp.

Kišpatić M., 1891. Potresi u Hrvatskoj. Rad Jugoslavenske Akademje Znanosti i Umjetnosti, CVII, Razred Matematičko-Prirodoslovni, 81–164.

Krasić S., 2013. Obnovitelj našega grada i slobode. In: Stjepan Gradić otac domovine, Catalogue of the exhibition for the 400th anniversary of the birth of Stjepan Gradić, Knežev dvor, Dubrovnik, pp. 224–331.

Ljubić Š., 1883. Poslanice dubrovačke na mletačku republiku. Starine, Zagreb, 15, 1–94.

Mihajlović J., 1947. Seizmički karakter i trusne katastrofe našeg južnog Primorja od Stona do Ulcinja. Srpska akademija nauka i umetnosti, posebna izdanja, knj. CXL, Prirodnjački i matematički spisi, knj. 39, VI + 149 pp., 8 sl., 14 priloga, Beograd.

Montandon F., 1953. Les tremblements de terre destructeurs en Europe. Genéve, 195 pp.

Papazachos B.C. and Papazachou C., 2003. The earthquakes of Greece. Ziti Publ. Co., Thessaloniki, Greece, 286 pp. (in Greek).

Radonić J., 1939. Acta et diplomata ragusina, III, 2. Dubrovačka akta i povelje. Fontes rerum Slavorum meridionalium, Srpska kraljevska akademija; Srpska akademija nauka, Belgrade.

Redi F., 1795. Lettere di Francesco Redi patrizio aretino. Tomo III, Per Gaetano Cambiagi Stampator Granducale, In Firenze l'anno 1795.

Rešetar M., 1893. Dva izvještaja o velikoj dubravočkoj trešnij. Starine, Zagreb, XXVI, 27–32.

Rodriguez de la Torre F., 1993. Documentacion existente en el Archivo General de Simancas (Espana) sobre algunos terremotos de Europa y Asia occidental, excluidas las peninsulas

Ibérica e Italica. In: M. Stucchi (ed.), Historical Investigation of European Earthquakes. Materials of the CEC Project Review of Historical Seismicity in Europe, vol. 1, CNR, Milano, 75–87.

Samardžić R., 1960. Борба Дубровника За Опстанак После Великог Земљотреса 1667 Г. Архивска Грађа, 1667-1670 (Raguse dans sa lutte pour l'existence après le grand tremblement de terre de 1667, documents d'archives, 1667-1670). Académie serbe des sciences. Recueil pour l'histoire, la langue et la littérature du peuple serbe, IIIe Classe, Beograd, 655 pp.

Samardžić R., 1962. Veliki vek Dubrovnika. Belgrad. 538 pp.

Shebalin N.V. (ed), 1974. Atlas of isoseismal maps. III, UNDP-UNESCO Survey of the seismicity of the Balkan region. Skopje, 275 pp.

Shebalin N.V., Karnik V., Hadžievski D. (eds), 1974. Catalogue of earthquakes of the Balkan region. I, UNDP-UNESCO Survey of the seismicity of the Balkan region. Skopje, 600 pp.

Staikoff S.D., 1930. Matériel sur la séismographie de la Bulgarie, la Thracé et la Macédoine. Spis.na Blg. Ak. nauk. kn., Sofia, XLII, 46 pp.

Villari L., 1904. The Republic of Ragusa, An episode of the Turkish conquest. J.M. Dent & Co., London, 430 pp.

Chapter 2
The Earthquake Observers

2.1 Accounts and Perspectives

Who were the observers of the Great 1667 earthquake?

From its very start, the research behind this book focused on finding the answer to this question, by keenly perusing the catalogues of libraries and archives, and going on a quest for the surviving written testimonies of the earthquake's effects.

The authors of these accounts are our observers of the 1667 earthquake, and in the following pages they will be entrusted to recount their experiences of this exceptional circumstance.

The pieces of their narratives and points of view will be connected into a consistent scenario, presented with the help of tables and maps, by describing the locations, observations, and perspectives of some fifteen observers and their respective companies. The additional information that is gained from the observers, as well as the historical-political milieu, will be used to put these observations in context.

Each of the observers adds a unique flavour to the story of this earthquake. Some of their stories are pieces of literature in themselves; their language and lexicon taking one back in time, to listen attentively to these people who are sharing their experience by putting into words, which they often say to be inadequate to the task, their feelings, voices, and inner thoughts. These accounts allow the readers, as much as possible, to "breathe their air, see with their eyes, walk the path they tread" (James 2009). It is with this intention that quite a number of their accounts are made available in extenso in the Electronic Supplementary Material (http://extras.springer.com), in their original text and language. The list of its contents is supplied in Table 1.2.

The observers for the 1667 earthquake are introduced in no specific order. Rather, they are divided into three groups since they—unknowingly—acted in similar ways in the wake of the earthquake.

P. Albini, *The Great 1667 Dalmatia Earthquake*, SpringerBriefs in Earth Sciences,
DOI 10.1007/978-3-319-16208-9_2

This overview of the earthquake observers will consider (i) those who experienced the earthquake in the town of Ragusa, then left the place, as soon as possible, to find shelter in other countries (Sect. 2.1.1); (ii) those who travelled to-and-fro the affected area, performing their official mandates (Sect. 2.1.2); and (iii) those who had to remain in their places of residence, either as a matter of necessity or making a virtue out of necessity (Sect. 2.1.3).

At the end of this analysis, the location of the observers at the time of the earthquake will be pinned down, and sound evidence collected, pending the determination of how independent and original their accounts are.

2.1.1 Observers in Ragusa

Pedro de Torres

The day after the earthquake, i.e. 7 April, finds Pedro de Torres, the archbishop of Ragusa, together with 150 other people on board a ship anchored in the harbour of Santa Croce (Fig. 2.1). Among those on the ship were 62 nuns that were the sole survivors of the approximately two hundred nuns living in the several nunneries inside the walled town of Ragusa. As he wrote in a letter (Doc#4) presumably addressed to his relatives in his home town Trani (a town in Apulia, southern Italy), he narrowly escaped death after the collapse of his palace, and decided to leave Ragusa, and move to the Italian town of Ancona, on the western Adriatic Sea coast, then within the territory of the Papal States. Pedro de Torres's letter is dated 9 April, while he was still in the island of Calamotta, part of the Republic of Ragusa. The ship then moved to Slano, but the adverse winds and a storm caused

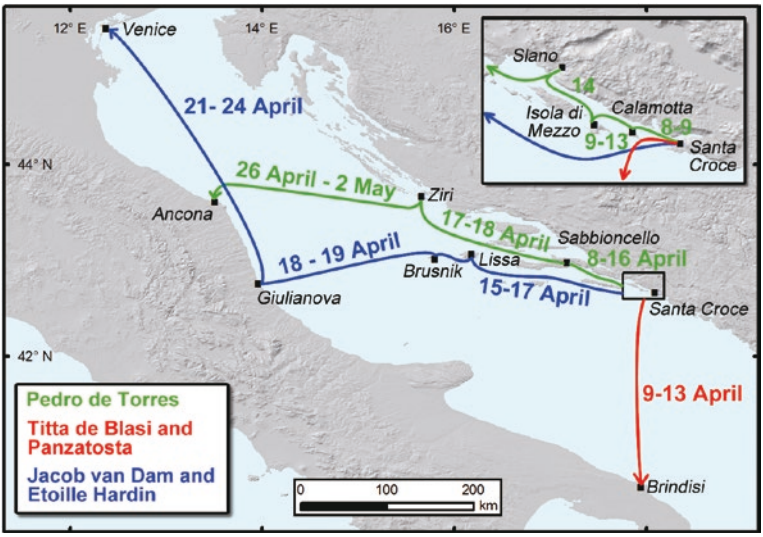

Fig. 2.1 Routes travelled in the days indicated, by: the archbishop Pedro de Torres and the nuns; the gentlemen Iacob van Dam and Etoille Hardin; and the merchants Titta de Blasi and Panzatosta

the ship and its passengers to be stuck there until 15 April. In a letter to a relative, the canon of the archbishop, Biagio Squadro confirmed the movements of his archbishop since the moment the earthquake occurred (Doc#16). Squadro added that the ship that the archbishop and the others had boarded was a "petacchio" ("a small, square-rigged vessel", Muscat 2008) of a certain Natal Vincenti (see also Doc#49). While Squadro was writing his letter on 14 April, he estimated that the archbishop should have safely arrived in Ancona already, since eight days had passed. Perhaps he was a little over-optimistic.

The adventures of the archbishop and his fellow passengers are described in the "Narrative of the navigation of Mons. Archbishop with the Nuns of Ragusa, of their welcome in Ancona on 2 May 1667, and of other events of the already narrated Earthquake"(Doc#79), an 8-pages printed leaflet, very similar in its style to an interview to the archbishop and his travel companions. The "Narrative" mentions the stops on the route of this unfortunate group in its 27-days long journey from Ragusa to Ancona (Fig. 2.1), a route which in normal conditions, and with a good vessel, could take eight to ten days.

The archbishop and the surviving nuns did not return to their country, the Republic of Ragusa, before 25 December 1667 (Cerva 1744).

Iacob van Dam and Etoille Hardin

On 27 March 1667, a party of about 40 people, mostly belonging to a Dutch delegation headed by Ioris Croock, appointed ambassador of the "States General of the United Provinces of the Netherlands" in Constantinople, including the appointed consul in Izmir (Turkey) Iacob van Dam, left the Venetian port of Malamocco on board a Venetian galley, towards Ragusa (Doc#62). Arrived at Santa Croce harbour on the 1st of April, the Dutch delegation was housed in an ad hoc accommodation within the walled town, and was officially welcomed by the Rettore and Consiglieri of the Republic of Ragusa the day after. The Ragusan noblemen and their Dutch guests met and visited until Tuesday 5 April, and more visits had been planned for the following day, i.e. the 6th of April. But things were to develop quite differently.

Together with the approximately 40 Dutch people, four French and one German gentlemen had also travelled to Ragusa, as it is confirmed in a letter by the French gentleman Etoille Hardin (Doc#72).

Van Dam refers to a number of 34 people at the beginning of his report (Doc#62). However, the exact number of the persons forming the composite group that left Venice at the end of March is not clear. Women, children, and servants seem not to be included, as at that time they were usually considered separate categories in population countings.

By collating the reports written by two survivors of that brigade, namely Iacob van Dam (Doc#62, in Dutch) and Etoille Hardin (Doc#72, in French), it seems that only fourteen survived the earthquake, as listed below:

– in the same house, the one assigned to the Dutch retinue of Ioris Croock, van Dam himself, five people sleeping in his same room, another five servants of Croock, who were in the upper floor, and the nurse of Croock's three-months old baby survived;

– in the house assigned to the French and German gentlemen, five in all together with four valets, only Mr. Baltazar and Mr. Etoille Hardin survived, both unhurt and rescued after three nights and two days spent under the ruins.

On 9 April, the fourteen survivors rejoined by chance at Santa Croce, to board, once more, on the same ship. They took care of their less fortunate companions, especially van Dam, who also spent time downtown to retrieve as many goods as possible from the ruins. The survivors sailed together back to Venice on 15 April, where they arrived on 24 April. Their route is shown in Fig. 2.1, following what is told in the exhaustive report given by van Dam to the States General, at his return to Holland (Doc#62).

Titta de Blasi and Panzatosta

Amongst the people who found themselves in the Republic of Ragusa on 6 April 1667 were two merchants ("patron" in original) Titta de Blasi and Panzatosta. They are mentioned in an anonymous letter, existing in a contemporary copy (Doc#20). The letter is dated 15 April in Brindisi (Apulia, Italy) and was sent to a similarly unknown addressee in Lecce, another Italian coastal town about 40 km to the south of Brindisi. In addition to providing information about the time of occurrence and the effects of the earthquake, and also mentioning archbishop Pedro de Torres, the letter reports that two of the sailors employed by the merchants Titta de Blasi and Panzatosta were buried under the earthquake ruins, and that only one of them was rescued and taken back to Brindisi. The presumed route of the merchants and surviving sailor on their way back home is shown in Fig. 2.1. These merchants seem to be, in fact, the same "marinari" (sailors) that the Ragusan merchant Veselicich, based in Brindisi (Doc#26), mentioned as those who reported what happened to his home town, the territory of the Republic of Ragusa, and in the neighbouring areas.

2.1.2 Travelling the Adriatic Sea

In the days immediately after the earthquake, the stretch of sea running parallel to the eastern Adriatic Sea became a very-well travelled route by Venetian envoys and officers, heading either away from or towards the affected areas (Fig. 2.2).

The first to travel this route, from south to north, were two inhabitants of Cattaro. They were sent as envoys by the Venetian Provveditore Estraordinario in Cattaro, Giacomo Loredan, with the special mandate to reach Zara, where the Venetian Provveditore Generale in Dalmatia et Albania had then his seat, and present to him an oral report of what disaster the earthquake had caused inside the areas under Venetian control, and, possibly, to the nearby strongholds of their powerful Ottoman neighbour.

Triffon Drago

The first envoy, "Monsignor Canonico" Triffon Drago, left Cattaro two hours after the earthquake. He was to travel "con espressa fellucca" (with an ad hoc and

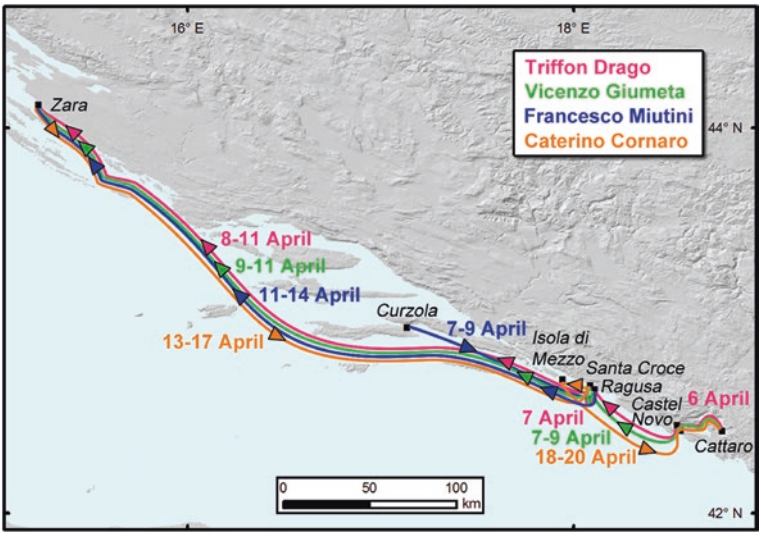

Fig. 2.2 From 6 April 1667 onwards, the Venetian envoys and officers travelled the Adriatic sea from south to north and viceversa: Triffon Drago from Cattaro; Vicenzo Giumeta from Cattaro; Vicenzo Miutini from Curzola; Caterino Cornaro from Zara

fast felucca, a wooden sailing boat) according to the order by Giacomo Loredan, Provveditore Estraordinario in Cattaro (Doc#2).

In his "Constituto", an oral testimony that was to be immediately recorded (Doc#13), Drago made a very precise description of what happened in Cattaro, as well as presenting the information he had collected from the non-Venetian settlements he had contact with along his way to Zara. Triffon Drago's journey is summarized in Table 2.1 and shown in Fig. 2.2.

Vicenzo Giumeta

The second envoy sent from Cattaro was Vicenzo Giumeta, who unexpectedly arrived in front of the Provveditore Generale in Zara before Triffon Drago, who had left one day earlier. Because he was carrying the official letters that Giacomo Loredan had written (Doc#2) to inform the Provveditore Generale Caterino Cornaro, Giumeta was received as soon as he arrived, on Monday 11th April, around 7 p.m. (Doc#12).

Giumeta's "Constituito" (Doc#11) adds details on the effects to the walls of Ragusa, especially about the settlement of Santa Croce (Table 2.2 and Fig. 2.2). In all, it is in full agreement with the report by Triffon Drago.

Caterino Cornaro and Francesco Miutini

The last but definitely not least of these all-Venetian officers, was Caterino Cornaro, a high-ranking Venetian officer, who at the time of the earthquake was acting as Provveditore Generale in Dalmatia et Albania, based in Zara. After Cornaro had received the reports of the two envoys from Cattaro, namely Drago and Giumeta, he arranged ships and goods to be sent in the affected area. He

Table 2.1 Triffon Drago's journey and observations (Doc#13)

Place (as quoted)	Date, 1667	Time	What and where
Cattaro	Wednesday 6 April	14 h	Earthquake
Cattaro	Wednesday 6 April	16 h	T.D. leaves Cattaro
Canale (Bocche di Cattaro)	Wednesday 6 April	16–22 h	T.D. crosses Boka Kotorska
[Perasto]	Wednesday 6 April	16–22 h	T.D. meets the son of the Venetian Captain based in Perasto, and collects information on Perasto
[Isola di San Zorzi]	Wednesday 6 April	16–22 h	T.D. meets the son of the Venetian Captain based in Perasto, and collects information on the "Isola di San Zorzi"
Castelnuovo	Wednesday 6 April	16–22 h	T.D. passes through and makes an "observation with a hand-held telescope"
Rose, peninsula of Lustica	Wednesday 6 April	22 h	T.D. orders the vice-captain (or "Sopracomito") of the "Abesana" Galley anchored in Rose, at the entrance of the Bocche di Cattaro, to move closer to the town of Cattaro ("sotto la Città") and help the inhabitants with fresh water and food
Canale	Wednesday 6 April	Night	Due to adverse winds, T.D. cannot leave Bocche di Cattaro
Castelnuovo	Thursday 7 April	Morning	T.D. observes on passing
Ragusa	Thursday 7 April		T.D. observes on passing
Santa Croce (harbour)	Thursday 7 April		T.D.'s arrival at the harbour
Zara	Monday 11 April		T.D.'s arrival at Zadar
Zara	Tuesday 12 April	Day	T.D. reports to the Provveditore Generale in Dalmatia et Albania, Caterino Cornaro

Hours in the document (and in this table) are expressed according to the Italian style (see Sect. 3.1)

Table 2.2 Vicenzo Giumeta's journey and observations (Doc#11)

Place (as quoted)	Date, 1667	Time	What
Cattaro	Wednesday 6 April	14 h	Earthquake
Cattaro	Thursday 7 April	At noon	Departure to Zara, with letters for the Provveditore Generale
Ragusa	Friday 8 April	At dawn, sailing Outside the walls	V.G. sees two pieces of the wall fallen in the part at "Garbino" (other name for Libeccio, the SW wind)
Santa Croce	Friday 8 April/ Saturday 9 April	Stop and departure	Many houses of gentlemen fell as well as half of the monastery
Zara	Monday 11 April	24 h	V.G. reports to Caterino Cornaro, Provveditore Generale in Dalmatia et Albania

Hours in the document are expressed according to the Italian style (see Sect. 3.1)

Table 2.3 Caterino Cornaro's journey and early observations (Docs#17, #25, #33)

Place (as quoted)	Date, 1667	Time	What
Canale di Zara	Thursday 14 April	n.a.	Reached by Francesco Miutini, from Curzola, and departure
Porto di Santa Croce	Saturday 17 April	Evening	At anchor
Porto di Santa Croce	Sunday 18 April	Day	Writing a dispatch (Doc#25) and observing
Isola di Mezzo	Sunday 18 April	n.a.	Observing
Ombla ("fiumara")	Sunday 18 April	n.a.	Observing
Castel Nuovo	–	n.a.	Observations about this place are not first hand
Cattaro	Tuesday 20 April	Evening	Arrival (see Doc#34)
On the ship in the harbour of Cattaro	Wednesday 21 April	n.a.	C.C. meets Loredan, visits Cattaro and acquires the survey by engineers Benaglio e Moretti C.C. writes a dispatch (Doc#33)

recalled his galley that was on a mission against the Corsairs infesting the Adriatic Sea, and ordered the engineers Benaglio and Moretti to leave Spalato for Cattaro to survey the fortifications. Eventually, on 13 April Cornaro received the money he was waiting for from Venice (Doc#15), the naval officer Michiel was back with Cornaro's galley (Doc#17), and on Thursday 14 April Cornaro was ready to set sail towards the southernmost Venetian territory of the eastern Adriatic sea. While Cornaro was still in the stretch of sea ("Canale") off-shore of Zara (Doc#17), he was met by the envoy Francesco Miutini, who had been sent on 8 April by the count Paulo Pasqualigo (Doc#10), the Venetian officer in charge of the island of Curzola (Fig. 2.2).

While Miutini had been refused permission to enter the walled town, and the territory of the Republic, he brought with him quasi-first-hand information on the town of Ragusa, information that was considered to be of great interest by Cornaro (Doc#17). On the same day of his report, Miutini sailed back to southern Dalmatia with Cornaro (Fig. 2.2). It took them three full days to get to the harbour of Santa Croce (Doc#25). Once there, two Ragusan noblemen, Nicolò Bona, introduced later, and Biagio Bosdari (Doc#49), presented themselves to Cornaro with a copy of a letter (Doc#18) dated 15 April signed by the Rettore and Consiglieri of the Republic of Ragusa, a letter that Cornaro had not received earlier because he had already left Zara (Doc#25). Details on Cornaro's journey and observations are given in Table 2.3 and Fig. 2.2.

Apart from reporting the actions he decided to undertake without any further delay to assist the population, Cornaro's dispatches to the Senate of the Republic of Venice emphasise the political situation at the borders of the Venetian territory.

2.1.3 Stuck in a Moment

The last group of earthquake observers is comprised of another eight people who did not or could not leave their town or country, because of the earthquake or its aftermath.

Three of these observers wrote soon after the earthquake, to share their experiences with relatives or friends, and then disappeared from the scene, as they did not produce any further documents nor are they mentioned in any other later record. All that remains are their words, which supply a sort of 'snapshot' of the situation as it was on the day they chose to write, i.e. after 10 April (Doc#21), on 14 April (Doc#16), and on 16 April (Doc#22).

Anonymous

An anonymous Venetian citizen wrote a rather desperate letter to his brother, while stuck at the harbour of Santa Croce (Doc#21). Though the letter is not dated, the author mentioned events also reported by other observers, such as the adverse winds keeping them from sailing away from the affected area, and the Mass on Sunday 10 April, Easter, attended in Calamotta. Both particulars seem to locate this observer in the same place and situation as experienced by the archbishop Pedro de Torres, but there is no evidence anywhere in this letter or in any other available account to prove this.

Biagio Nicolò Squadro

Biagio Nicolò Squadro was the canon of the archbishop of Ragusa, mentioned earlier in this book, quoting his account of the archbishop's departure (Doc#16). Indeed, Squadro's letter stands out for his "down-to-earth" style in describing the earthquake, in terms of both its occurrence and the consequent actions of his companions and himself in the minutes that followed.

Squadro comments on the first meeting held by the emergency council, as well as where and how he spent the eight days that had passed between the earthquake and his writing of the letter: who had died, who had stayed and who had decided to leave, as well as which were the first decisions taken by the emergency council (Doc#9). Squadro ends with a thinly veiled criticism of the archbishop's decision to abandon his archbishopric, while the population was in so serious need of material and religious supports. The letter is addressed to Squadro's uncle, but the latter's name or his place of residence are not mentioned.

Vitale Andriasci

Two days after Squadro composed his letter, the Franciscan friar Vitale Andriasci wrote a long letter to the Ragusan Diodono Bosdari, a nobleman and merchant based in Ancona (Doc#22). Much of his letter describing the aftermath of the earthquake is in stark contrast to other accounts that make the horror and tragedy of the situation pass from the written words directly to the readers' hearts. However, the closing part of Andriasci's letter is written in a matter of fact style. It deals with the first actions taken to restore the order in the town of Ragusa (Doc#9), and the status of the Bosdari family business in Ragusa. He points out that Diodono's brothers cannot leave "for the sake of the business, and for that of the recovery of the goods buried under the ruins" (Doc#22).

Despite the afore-mentioned 'apparent inconsistency' in the tone of Andriasci's report, it has been considered by most of the previous modern studies as one of the most complete and reliable sources of information on the 6 April 1667 earthquake. There are many reasons behind Andriasci's success, mainly that his letter was printed in Ancona, almost immediately after having been delivered, it had a larger diffusion than most of the other accounts, which mostly remained handwritten, and were not as available to the general public.

Finally, there are five more observers that remained in their places of residence, and lived out the days and the months after the earthquake, taking care of local public services; religious affairs of the survivors, or the repair and salvage of their (former or destroyed) goods and businesses.

Giacomo Loredan

Giacomo Loredan was then Provveditore Estraordinario in Cattaro, appointed by the Senate of Venice to take care of the Venetian strategic stronghold. Amongst the Venetian officers reporting on the 1667 earthquake, Loredan was the most affected and upset, as he came close to losing his life, and actually lost his personal belongings in the earthquake. Loredan's letter dated 7 April (Doc#2) is addressed to the Provveditore Generale Caterino Cornaro, his senior in the administrative Venetian hierarchy. It is the most immediate official document detailing the earthquake and was conveyed, in person, to Caterino Cornaro by the envoy Vicenzo Giumeta (see Sect. 2.1.2).

On the same day, Loredan wrote another letter to the Senate in Venice (Doc#3), with the same content as the above-mentioned letter. In all, there are five letters only from Loredan alone, but they were short and not very illustrative in comparison to the dispatches written by Caterino Cornaro.

For two weeks Loredan was silent, until he wrote to the Senate in Venice again on 21 April, the day after he had welcomed Cornaro on his arrival in Cattaro. Loredan showed the Provveditore Generale around the damaged Cattaro, and presented him with the engineers' report. The 8 May letter to the Senate was sent after Cornaro had left, and included pleas from the inhabitants of Cattaro and surroundings (Doc#93).

In 1669, as was commonly asked of Venetian civil officers, at the end of their mandate, Loredan presented to the Senate in Venice a final report, including accounts of both his activities and an update on the status of the territory under his authority (ASVe 1669). The "Relazione" (report) is a detailed overview of the effects of the earthquake inside the Venetian territory, supplying figures on the population of the main settlements, too. This additional information on the settlements under Venetian control and population proved useful in the process of assigning macroseismic intensity.

Bernardo Giorgi

After the Archbishop Pedro de Torres and the canon Biagio Squadro, another important personality of the religious life of Ragusa in 1667 was that of the archdeacon Bernardo Giorgi, a writer and priest from one of the noble families ruling the Republic of Ragusa.

Giorgi decided to remain in the country, despite his companions pressing him: "in Gravosa [Santa Croce] … the Archbishop, and the nuns with him, wanted me

to join them [to Ancona], maintaining that the rumours about such a disaster were going to attract looters, and profiteers from land and sea, together with bringing the plague back" (Doc#106).

It is only two weeks after the earthquake, on 21 April, that Giorgi found some energy, "time, and convenience" to write a letter to the Ragusan Stefano Gradi, an influential abbot then living at the papal court in Vatican, Rome. Though concise, the letter is very informative (Doc#30), and it is followed by another letter, undated, but possibly written almost immediately after, referring to the previous one (Doc#31). The second letter is longer, and in addition to the accurate description of strength and duration of the earthquake (see Chap. 3) it supplies details of importance concerning the earthquake's effects on both the town of Ragusa and the country houses (villas) of some noble Ragusan families. The third letter is dated 28 May (Doc#106), and tells about Giorgi's life in the weeks after the earthquake, spent either on vessels in the harbour that fronts onto the town of Ragusa or in that of Santa Croce, where most people had sought shelter.

Nicolò Bona

Nicolò Bona, born at the beginning of the seventeenth century from a noble Ragusan family, was from the early years of his career a pillar in the independent Republic of Ragusa, as testified by his writings and knowledge of legal matters, and his participations in two legations to the Ottoman Porte before 1667 (Fig. 2.3). Bona's destiny was certainly affected by and intertwined with the relationships of the Republica of Ragusa with the Ottomans. He was to end his life while participating in a delegation sent to ask the Ottomans for a delay in the payment of their annual tribute, in 1678. Imprisoned in the Ottoman gaol at Silistra (Bulgaria), he became seriously ill and was not able to be adequately nursed.

Bona also authored a "sort-of" diary, the first twelve pages of which describe the aftermath of the earthquake (Doc#49).

From the diary's content, it appears that he began to write after 23 April, perhaps when he could find time and opportunity, or during a break from his many activities in support of the people and the government of the Republic. There can be no argument that the earthquake touched Nicolò Bona deeply. Known for his literary and

Fig. 2.3 Portrait of Nicolò Bona (Casnacich 1841)

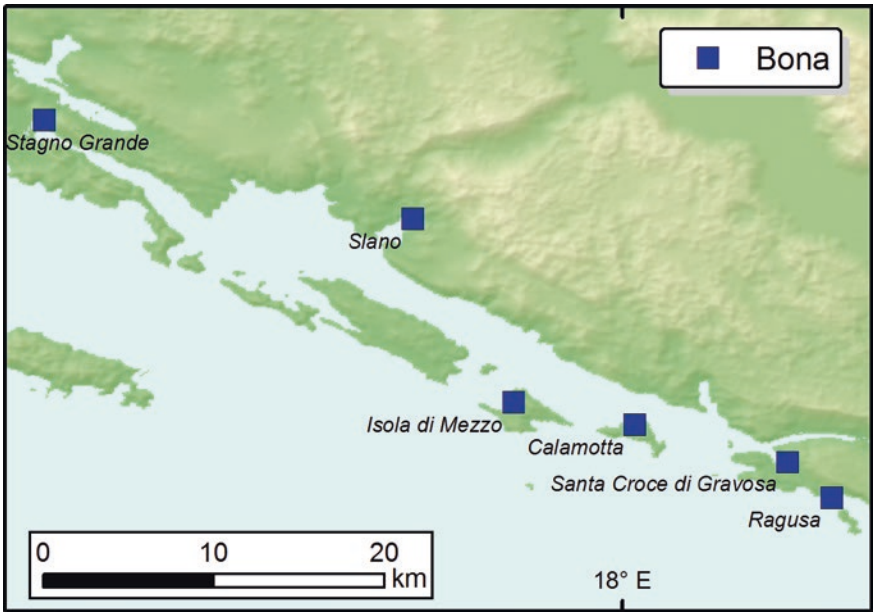

Fig. 2.4 Bona's whereabouts in the first two weeks after the earthquake

poetic skills in Croatian language, he composed a short poem on the earthquake that opens a 24-pages booklet, completed by the poems, all in Croatian, by two Ragusan writers and intellectuals of that time, Pietro Canavelli and Baro Bettera. The booklet was published in Ancona on 26 September 1667, under the auspices of the Ragusan merchant Diodono Bosdari, based in Ancona, and "interpreter of the Illyric language for the Holy Office" (Grad Dubrovnich 1667). Its function was possibly to collect funds for the recovery and restoration of Ragusa.

After having spent the first three days after the earthquake in the harbour of Santa Croce, on a one-mast brigantine ("grippo") from a Palavicinovich from Perasto, Bona moved himself and his family to Stagno Grande (Fig. 2.4).

Leaving his family, he went back to the town of Ragusa, keeping watch on the fire that had started on the same day the earthquake occurred, to expand and continue for many days afterwards, and taking particular care of the "Dogana" (customhouse) and the goods it contained. On Sunday 17 April, "because there was nobody in Ragusa of a higher rank than myself to be appointed ambassador" (Doc#49), together with Biagio Bosdari he met Caterino Cornaro who had just arrived from Zara in the harbour of Santa Croce (see text above and Fig. 2.2). They delivered to Cornaro a copy of the 15 April letter by the emergency council of the Republic (Doc#18), then "on board His Eminence's galley, we plead him to take pity of our miseries, once we told him all that had happened, he barely succeeded in choking back tears, comforted us, finally he showed off with making promises, that time and later events showed to be empty ones" (Doc#49).

The places Bona visited are shown in Fig. 2.4, and what kind of information he jotted down in his "diary" (interrupted, for unknown reasons, and thus incomplete) will be detailed in the following chapter.

Francesco Bobali

"I did not write to Your Excellence before, because I did have neither an inkpot, nor a pen, not even a piece of paper" (Doc#24).

Dated twelve days after the earthquake, this is the first item of an amazing set of letters that the Ragusan merchant Francesco Bobali exchanged with his nephew Marco Basegli, consul of the Republic of Ragusa at the Republic of Venice.

At the time of the earthquake, Bobali was in the church of the Holy Rosary, inside the walled town of Ragusa. From his own words, one learns that he had to get past ruined houses and through other "unfamiliar" obstacles, and when he was able to finally reach his family town house, it was to discover that most of his relatives, including his wife and his little daughter "Aniza mala" (little Ann) were either already dead or so "under the ruins" that there was no hope they were going to be saved. Having spent the first ten days after the earthquake sleeping under a tent "made of a sail" in a piece of land close to the Pile gate of Ragusa, he moved first to Santa Croce and then to Cobasc with the survivors, among which Marco Basegli's mother.

According to Vojnović (1912) there are 24 surviving letters, written by Francesco Bobali between 18 April 1667 and 31 July 1668. In this research (see Table 1.2), only six letters, dated between 18 April and 18 May 1667 are considered, and used in the—sometimes abridged—version supplied by Samardžić (1960).

Bobali's letters are undoubtedly unique documents, whose style, content and volume eclipse other detailed descriptions of the earthquake effects, such as those of Triffon Drago and Caterino Cornaro, and so on.

Bobali's letters are unique also for the language they are written in. He chose predominantly Italian, but he switched to the Slavic language of that time in the middle of a reasoning, or, more often, in the middle of sentences, to describe particularly touching situations, or to rage against somebody, or for other not so evident reasons.

In the 11 April resolution of the emergency council of the Republic of Ragusa, Francesco Bobali appears among the ten newly appointed captains, who were charged of taking care of "administering the justice and governing the Republic pro interim, and when seven of them will be present they will be able to enforce any resolution by majority" (Doc#9).

In the weeks following the earthquake, Bobali also travelled the territory of the Republic of Ragusa, similarly to Nicolò Bona, collecting information from those he met while taking care of affairs of the Republic of Ragusa. In all, Bobali's letters contributed information on the earthquake's effect in 21 different places inside the territory of the Republic of Ragusa (Fig. 2.5). This is another aspect of the

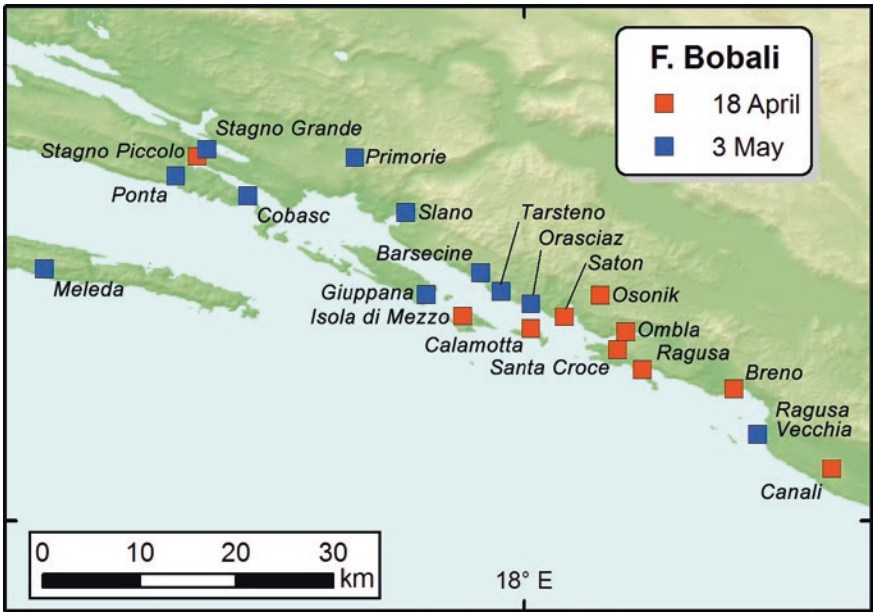

Fig. 2.5 Bobali and the places he mentioned in his two letters of 18 April and 3 May 1667

Fig. 2.6 Zmaievich's birth place, Perasto, and the places he mentioned in his pastoral visit in the territory of the diocese of Antivari (Zmaievich 1671)

uniqueness of Bobali's testimony, full of humanity, civic sense, and attention to the feelings of the people close to him.

Andrea Zmaievich

The last eyewitness and observer of this overview is Andrea Zmaievich, who was born in Perasto (top left corner in Fig. 2.6) from a noble and wealthy family, and had completed his course of study at the "Collegium de Propaganda Fide" in Rome (the top boarding school for theological study of the time). He returned to his home town in 1656, after having been appointed abbot of the abbey located on the Scoglieto di San Zorzi (literally Rock of Saint George) right in front of Perasto. This was a prestigious post, and also required the approval of the Senate of the Republic of Venice (Farlati et Coleti 1817).

On the morning of Wednesday 6 April 1667, abbot Zmaievich had planned to go to Ragusa, and on his way he stopped on the island to serve the "Requiem" for a woman who had died in Perasto (detail supplied by Premrou 1924, and reported by Milošević 1970). While he was at the altar, the earthquake happened, and Zmaievich was buried under its ruins, to be rescued by other inhabitants of Perasto who were also attending the religious service.

Well-versed in at least three languages, Latin, Italian and Croatian, Zmaievich chose to recount his own experience of the earthquake in the first 25 stanzas, up to verse 146, of the poetic epistle "Slovinska Dubrava" (Slavic Oak Forest). Counting a total of 58 stanzas with different metrics for 324 verses in all, Zmaievich's poem was first edited by Milošević (1970), who stressed in his

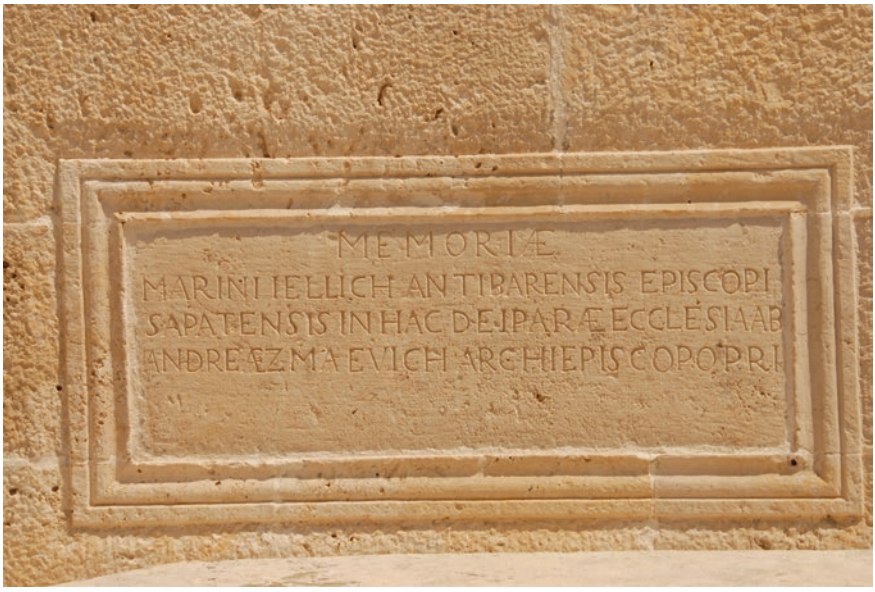

Fig. 2.7 Epigraph placed by Andrea Zmaievich (no date), Church of Scoglieto della Madonna, Bocche di Cattaro

comment that this poetic piece was written and dedicated by the author to the people of Ragusa, to comfort them and raise their afflicted hearts.

Some years later, precisely on 23 February 1671, Zmaievich was appointed archbishop of the diocese of Antivari, then inside the territory of the Ottoman Empire, located in today Albania, to the south of Perasto. Some notes on the extension of the diocese of Antivari are in Gelcich (1883).

It was probably on this occasion that he decided to pay homage to a previous bishop of Antivari, by dedicating an epigraph, inserted in one of the walls of the Church on the Scoglieto della Madonna, known also as "Madonna dello Scarpello" in Italian, and as "Our Lady of the Rocks" in English (Fig. 2.7).

In his role of archbishop, between September and November 1671, Zmaievich (1671) carried out a pastoral visit, documented in a standard report to be sent to the "Sacred Congregation for the Propagation of the Faith" in Rome, written in Italian, and the full text of which was published by Gelcich (1883).

Despite the style of reporting of his pastoral visit is in the form of a standard document on the status of the diocese, and of the Christian followers' behaviour in a country with the great majority following Islam, Zmaievich's descriptions of the places he visited (Fig. 2.6), as well as their situation, is full of references to "the earthquake", never mentioned in association with any date. After discovering that he had been personally affected by the 1667 earthquake while in Perasto, his testimony acquires a new meaning, as he could not have spoken of any other earthquake with the same level of understanding he had of the 1667 earthquake. Zmaievich's contribution to the knowledge of the 1667 earthquake's effect is outstanding, as it details on fifteen places located in today Montenegro and Albania, places that are not mentioned in any other contemporary source of information.

The overview of these observers can only be brought to a close by mentioning all the remaining suppliers of independent, unique observations, whose only fault was either not to jot down their observations in the first weeks after the earthquake; to not have any official task to carry out in relation with the earthquake, or to be not so important in the social scale to be interviewed and their stories to appear in some printed leaflets.

For the research on the Great 1667 earthquake, their contribution is valued, as they supplied information on areas, and, specifically, on places that had not been included in any other previous study.

2.2 Breaking News

"On Thursday evening [*21st April*] a rumour spread [*here, i.e. in Venice*] of a very frightful accident occurred in those places [*i.e. Dalmatia and Albania*], to such an extent that here the lords imprisoned he who broke, and spread the news, before the advent of a ship from Zara, a short time later, who brought and reported quite the same particulars" (Doc#46).

This is the incipit of the first letter written to the Rettore and Consiglieri of the Republic Ragusa by Marco Basegli and Luca Gozze, Ragusan representatives based in Venice. Though they do not mention who was the official reporter, it is quite obvious that the ship from Zara with the official report has to be the one sent by Caterino Cornaro with his dispatch of 12 April (Doc#12).

Apart from making one think over the difficulties met by early attempts at freelance journalism, this sentence on breaking news of the earthquake adequately introduces the issue of how and by what means an immaterial thing, as such news is, moves through time and space, and how one can try to chart these ways. This means to pass from a static view, the one made by the observations at the places where the observers actually were, to a dynamic one, trying to catch the observations in form of news while they move and spread, together with the observers or through the news channels of that time.

How many days did the news of the great earthquake take to break out of the affected area? What routes did the news take?

There are two important flows of information that can be reconstructed by using the documents produced between 7 April and the end of May 1667 (Fig. 2.8). The earliest flow is concentrated in the first ten days after the earthquake and restricted to the coasts of the Adriatic Sea, originating from Ragusa and Cattaro, as discussed and mapped in the previous pages (Figs. 2.1 and 2.2).

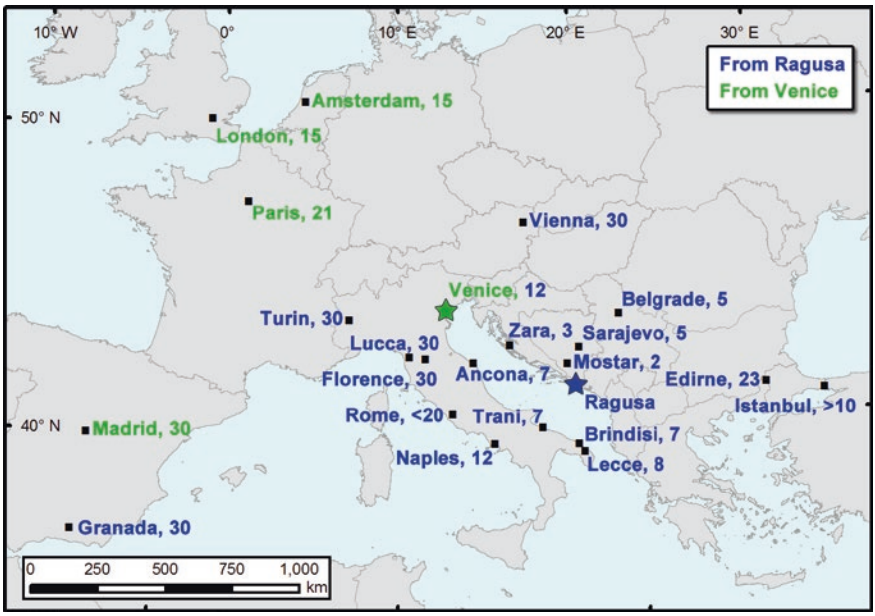

Fig. 2.8 Breaking news on the Great 1667 earthquake, and times of spreading across Europe (6 April to end of May 1667). The figures close to the place names indicate the days needed for the news to reach their destination

One addition only is worth mentioning, that the harbour of Santa Croce became on that occasion a place of "sorting and mailing" of people and news, together. Though they did not meet in their journey from Cattaro to Zara, both the envoys Drago and Giumeta stopped in the harbour of Santa Croce, inside the territory of the Republic of Ragusa (Fig. 2.2). Simultaneously, from 7 to 9 April, it was in Santa Croce that had found shelter, on board of two different vessels, the people who intended to leave the affected area, and namely the archbishop Pedro de Torres and the surviving nuns, the Dutch gentleman van Dam, the French gentlemen Hardin and Baltazar, and the other people, whose names are not known, travelling with them (Fig. 2.1).

On 10 April, Nicolò Bona met the archbishop Pedro de Torres while he was in Calamotta, and Bona went on board to supply his "five sisters" with money for the navigation (Doc#49).

Unexpectedly and involuntarily, the town of Ragusa and its harbour Santa Croce were suddenly at the heart of news spreading across Europe and the Mediterranean.

The second, massive wave of information, for sure the most interesting, spread from two centres, obviously the town of Ragusa, but not less important the capital of the other affected country, Venice. It is from Venice that the news broke throughout Europe and the Mediterranean between 20 and 21 April 1667.

The news from Ragusa travelled mostly by means of the diplomatic channels of that time: Rome (Doc#6), Naples (via Brindisi and Barletta, Doc#20), Florence (Doc#98), Turin (Doc#102), and Lucca (Doc#107), were the capitals of different regional Italian states, and to their governments the Rettore and Consiglieri addressed their letters for help. Though the Republic of Ragusa was very careful not to displease any other country with which there were diplomatic relationships, in the case of France (Docs#59, #70, #113,) and Spain (Docs#8, #69, #101, #110), their requests were not directly sent to kings or prime ministers, but travelled Europe through twisting routes in the hands of trusted middle men. Inevitable stops were Venice and Rome, the other two centres of intelligence of that time beside Ragusa in Dalmatia, and this explains also the reason why the news took so many days to be spread (Fig. 2.8).

In contrast, the existence of a dense network of Ragusan merchants and various representatives in the colonies of Ragusa inside the Ottoman territory explains the quick spreading of the news to the eastern and southern Balkans (Fig. 2.8).

The flow towards the northern countries started from Venice, as testified by the items in the early periodical press whose content is attributed to a "Letter from Venice", for instance in the Gazette Ordinaire d'Amsterdam (Docs#40, #65, #81), and Gazette de France (Docs#55, #91). Most of the periodicals in northern Italy, where also Venice is located, starts to be published some years later (e.g. Gazzetta di Milano) or their extant collections are so incomplete that no issues for the year 1667 could be retrieved (e.g. Gazzetta di Mantova, Gazzetta di Bologna). This caused news from Venice to spread mostly through anonymous leaflets, reproducing the text of "letters" of anonymous reporters, with the same style of the "Narrative" from Ancona (see above in the section devoted to Pedro de

Torres, Doc#79). An interesting case is that of "Relatione dell'horribile terramoto" (Doc#73), that was slavishly translated into French as "Relation de l'horrible tremblement de terre" and printed in Paris (Doc#74), as well as transposed into English as "A true Relation of the terrible earthquake" and printed in London (Doc#75).

Similarly, the text of the report by Iacob van Dam at the States General in Amsterdam had a large distribution, first in Dutch (Doc#62) and then in translation into German (Theatrum Europaeum 1677).

The private letters were the last either to be written or to be delivered. It so happened that Francesco Bobali in Ragusa wrote his first letter to Marco Basegli in Venice on 18 April (Doc#24), and that—as recalled in the incipit of this section—Basegli actually learnt of the earthquake from perfect strangers.

What Bobali had tried to do was to anticipate the breaking news, and above all to reassure his nephew that his mother was among those who had survived the earthquake.

All in vain, because as the Latin poet Virgil wrote some centuries ago for us to be out in the open, in a very free translation sounds as "Bad news [as rumours], there is nothing else that spreads so fast":

"Fama, malum qua non aliud velocius ullum" (Virgil, Aeneid, IV, 174).

2.3 One Last Observation

We may never know the names of many of the true heroes of this earthquake. Those who stayed in the town of Ragusa, or left their families to return to the town, and placed themselves in very real physical danger to help and protect others, and campaign to have their homes, businesses and way of life restored.

Each of the earthquake observers wrote according to his peculiar viewpoint, which characterised his account: alas, no woman could be included in the above overview. The different methods of communication and formality are strictly connected to the authors' age and position in the society of that time, but this does not exclusively determine their suitability "to observe" the earthquake's effects.

Given the impact of the earthquake and the reactions of various people, of several levels of status, one can only begin to fully appreciate the fact that they took the time to record their experiences: some out of a civil duty; some whose businesses were affected or destroyed; some in an attempt to relay the true shock and horror of the event to others; and some in the wake of immense personal tragedy.

The approach followed in this book was as wide as possible, aiming to avoid any categorization that may have hampered efforts to obtain reliable seismological information from as many first-hand observations as possible. This resulted in observations collected from as many different types of sources, from as many different repositories and in many languages as possible. In truth,

research without boundaries. Each source was put in its own space-time and scope context in order to assess the earthquake's effects. For this reason, even a poem is included (the one by Zmaevich, see next chapter) in the part that is, beyond any doubt, the description of what was the direct experience of an eyewitness.

After setting the stage where the earthquake occurred, after pinpointing each observer in his own space and his account in its own time, it is now possible to unfold the documents, extract the records, and describe in full the effects of the Great 6 April 1667 earthquake.

References

17th century sources

ASVe, 1669. "Relazione" (report) by Giacomo Loredan, Provveditore Estraordinario a Cattaro. Collegio, V (Secreta), Relazioni, b. 65, ff. 1r-6v + enclosures.

Grad Dubrovnich, 1667. Grad Dubrovnich Vlastelom u Trexgniu piesan gospodina Nicca Giva Bunichia. In Ancona, Nella Stamperia Camerale, 24 pp.

Theatrum Europaeum, 1677. Vol. X, Continuatio, for the years 1665–1671, Franckfurt am Mayn, 1751 pp.

Zmaievich A., 1671. Relazione dell'arcivescovo della diocesi di Antivari e del Vicariato di Budua, di Andrea Zmaievich della Sacra Congregazione per la diffusione della Fede. In: Gelcich G., 1883. Biblioteca Storica della Dalmazia, vol. 8, Documenti, n.37, 105–120.

Modern studies

Casnacich G., 1841. Nicolò Bona. In: Galleria di Ragusei illustri. Pier Francesco Martecchini, Ragusa, 245 pp.

Cerva S., 1744. Sacrae Metropolis Ragusinae. Manuscript, Library of the Dominican Monastery, Dubrovnik, 34-IX-6, vol. V, tomo VI, pp. 161 and ff.

Farlati D. et Coleti J., 1817. Illyrici Sacri Tomus Septimus. Ecclesia Diocletana, Antibarensis, Dyrrachiensis, et Sirmiensis, cum earum suffraganeis. Venetiis, 638 pp.

Gelcich G., 1883. Biblioteca Storica della Dalmazia, vol. 8, Documenti, n.37, pp. 105–120.

James P.D., 2009. Talking About Detective Fiction. Knopf, New York, 208 pp.

Milošević M., 1970. Pjesnička poslanica Andrije Zmajevića postradalom Dubrovniku 1667. godine. Anali Historijskog instituta JAZU u Dubrovniku, 12, 297–330.

Muscat J., 2008. The Petacchio, no place of publication, 44 pages, hardback. ISBN 978-99932-91-24-4, last accessed online 6 October 2014, at http://www.bdlbooks.com/history/1795-the-petacchio.html.

Premrou M., 1924. Izvestilo Frančiska Ricciardi o dubrovniškem Zemljotresu 1667. Prilozi na književnost, jezik, istoriju i folklor, Beograd 1924, IV, 210–216.

Samardžić R., 1960. Борба Дубровника За Опстанак После Великог Земљотреса 1667 Г. Архивска Грађа, 1667–1670 (Raguse dans sa lutte pour l'existence après le grand tremblement de terre de 1667, documents d'archives, 1667–1670). Académie serbe des sciences. Recueil pour l'histoire, la langue et la littérature du peuple serbe, IIIe Classe, Beograd, 655 pp.

Vojnović L., 1912. Prva smrt Dubrovnika (6 aprila 1667). Letopis Matice srpske, 87, 287, 3, 40–57 (in Serbian).

Chapter 3
And the Earth Began to Quake

3.1 When

Among the natural phenomena, earthquakes are distinctive, being sudden and brief moments in time that may make their effects felt over a large area, and are seldom forgotten by those who experience them. The latter two comments, of course, depend upon many factors, including the earthquake size.

In the case of earthquakes for which no instrumental recording is available, it is often a challenge to correlate and permanently bind the observations from the settlements scattered across the affected area. Anyway, a prerequisite condition for such studies is undisputable agreement, among the extant historical records, on the time when the earthquake occurred.

Fortunately, there are several and independent eyewitnesses who experienced the 1667 earthquake, and who included the date and time of the earthquake in their accounts. Amongst the observers introduced in the previous chapter, five have been selected for their accuracy in timekeeping, and their observations are shown in Table 3.1.

The measure of time in all accounts is according to the Italian style, that was in use in the 17th century in Italy and in those countries which were under its cultural influence, as it was the case with Dalmatia. The Italian style sets the beginning of the day at sunset, or more precisely when the bells strike at dusk, half an hour after the sunset (Dominici e Marcelli 1979). The first hour of the day consequently was not fixed, but changed in relation with the seasonal variation of the length of the day, as well as the latitude of the place. All these variables were taken into account (see more in Dominici e Marcelli 1979), as well as the fact that the full hour only is given in the available records. As it can be seen in the record by the Dutch observer (van Dam, in Table 3.1), other European countries were already using the French or "ultramontane" style, which had the day divided into two equal periods of 12 h, starting at midnight and noon respectively. In conclusion, on 6 April 1667,

P. Albini, *The Great 1667 Dalmatia Earthquake*, SpringerBriefs in Earth Sciences,
DOI 10.1007/978-3-319-16208-9_3

Table 3.1 Day and time of the 6 April earthquake in five selected eyewitnesses' accounts written between 7 and 30 April 1667

Place of observation and observer	Day and part of the day	Time	Duration
Cattaro Giacomo Loredan • Doc#3	"Hieri mattina su le 14 hore" Yesterday [6 April] morning at 14 h	14 h Italian style	
Ragusa Biagio Squadro • Doc#16	"… 6. corrente di mercordì santo … poco prima delle ore 14 … per il spatio d'una mezza Ave Maria" On 6 extant [April], the Holy Wednesday, soon before 14 h … as long as half of an Ave Maria	Soon before 14 h Italian style	Half of an Ave Maria
Ragusa Francesco Bobali • Doc#24 • Doc#32	"Adi 7 corrente a 14 hore … d'un pater noster" On 7 [sic] extant [April] at 14 h … as long as a Lord's Prayer "Io mi trovai alle 14 hore nella capela del SS-mi Rosarii solo … et in un pater noster" I found myself at 14 h in the Holy Rosary chapel, alone … as long as a Lord's Prayer	14 h Italian style	A Lord's prayer
Ragusa Bernardo Giorgi • Doc#30 • Doc#31	"alli 6 di questo mese [April] inanzi all'hore 14" On the 6th of this month [April] before the 14 h "ai 6 aprile fra le 13 e 14 hore … scossa brevissima d'una mezza Ave Maria" On 6 April between 13 and 14 h … as short as half of an Ave Maria	Between 13 and 14 h Italian style	Half of an Ave Maria
Ragusa Iacob van Dam • Doc#62	"sijnde Woensdaghs den 6. April 'smorgens ontrent tusschen dertien en veertien uyren Italiaans of 8 en 9 uyren Hollants … in een oogenblick/en qualijck den tijdt gheduyrende dat men onse Vader soude hebben gelesen" being wednesday april 6, in the morning between 13 and 14 h Italian style, or 8 and 9 h Dutch style … in a moment and about the time during which one would have read the Lord's Prayer	Between 13 and 14 h Italian style, or 8 and 9 h Dutch style	A Lord's prayer

in southern Dalmatia, the 14 h according to the Italian style corresponded to a time between 8:30 and 9:00 ante meridiem.

The duration of the event was described by the observers in a variety of points of view and wordings: (i) “an instant” or “a moment” is commonly used to indicate the abrupt, sudden, unexpected occurrence of the earthquake, rather than its duration; (ii) “a quarter of an hour” or “half an hour” seems to refer to the time period within which fell the foreshock, the main shock, and perhaps the perceptible aftershocks were felt, rather than the duration of the largest earthquake only. Some accounts compare the event duration with that of reciting a Credo—about 5 s, an Ave Maria—less than 10 s, or the Lord’s Prayer—about 15 s (see last column of Table 3.1). This is a measure of duration often found in European medieval chronicles, and was commonly used in urban centres up to the 17th century (Ferrari e Marmo 1985).

An accurate description of the duration of the foreshock and the main earthquake in the town of Ragusa is given by Bernardo Giorgi (see Table 3.1, also):

“Due scosse, ch’à me parvero cosa non grave, essendomi trovato in casa in luogo, dal quale movendomi leggermente a scender quindeci scalini, si fece l’altra scossa brevissima d’una mezza Ave Maria” (Two shocks, which to me seemed not to be so serious, while I was at home, in a place from which I started slowly to go down some fifteen steps, and then the other shock came as short as half an Ave Maria) (Doc#31).

Because of the availability of accounts by independent and reliable witnesses, from the towns of Ragusa and Cattaro, which can be considered—approximately—at the northernmost and southernmost tips of the affected area, there is no doubt that southern Dalmatia and the coastal part of today Montenegro was affected by one and the same earthquake. The largest and most damaging shock occurred on Wednesday 6 April 1667, at about 8.45 a.m., with a duration of 8–15 s.

3.2 Where and How Intense

3.2.1 From Accounts to Records

After having pinpointed the time of the earthquake, it is now possible to link the sparse information in the sources to each individual settlement affected, and extract the “records” that describe the earthquake’s effects at each place.

A “record” is here defined as only that part of the description supplied by each observer that turns out to be meaningful for seismological purposes. This clarification is necessary in this particular context, as the descriptions of the earthquake contained in the coeval sources of information were not written for the scope they are used in this book, i.e. to collect data on the earthquake’s effects in order to estimate the impact of this phenomenon.

To be in the position to extract reliable records on the earthquake’s effects, it would obviously be preferable to draw upon a rich set of primary and good quality observations, derived from several and varied accounts, with their diverse perspectives, evenly distributed among all the settlements in the area affected by the

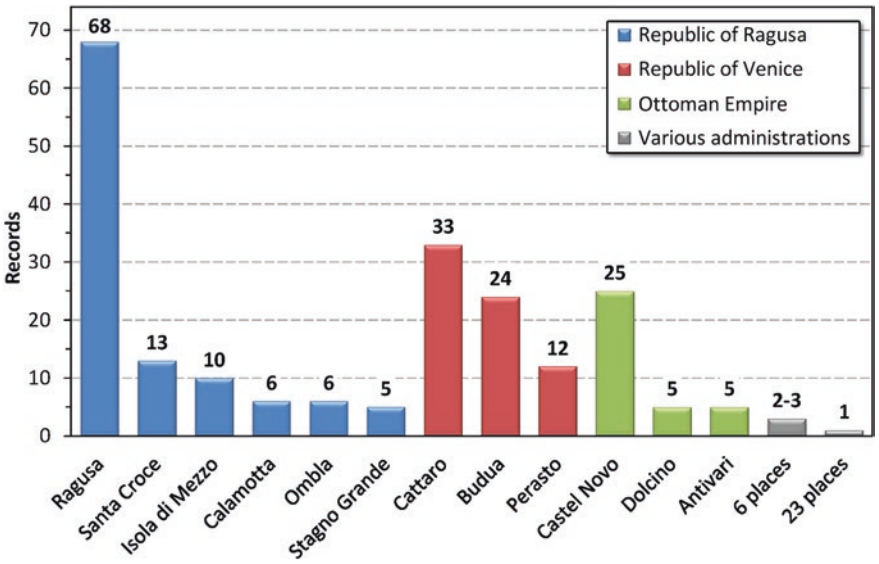

Fig. 3.1 Places and records: the graph shows the number of records extracted for each place from the documents listed in Table 1.2

earthquake. In reality, the situation is quite different. It has already been pointed out in contributions discussing the approach to the study of the earthquakes of the past centuries, that "between the actual earthquake and the modern observer come a series of what can be thought of as filters, which progressively distort the observer's view" (Musson 1998). The "filters of transmission" influence the documentation, and especially its survival to modern days.

Even this in-depth study on the 1667 earthquake could not avoid this bottleneck. Records are unevenly distributed among the 43 settlements that, according to the coeval documentation, are regarded to having been affected by this earthquake. For twelve of the places included in Fig. 3.1, records are abundant, and—not surprisingly—this is true especially for the towns of Ragusa and Cattaro. For an additional six places, fewer records are available. In the remaining 23 cases, an individual, unique record is the only observation whose content is 'seismologically' significant.

3.2.2 Place by Place

The overview of the observers in the previous chapter has already introduced some of the places affected by this earthquake. In this chapter, the attention moves from the observers to the object of their observations, i.e. the settlements. In particular, quantitative details on their size and number of inhabitants have been looked for, as this kind of—supposedly 'ancillary'—information is undoubtedly

of importance in the process of assigning a macroseismic intensity value to the effects at each individual place (Grünthal 1998; Musson and Cecić 2002).

Such details were relatively easy to collect for Cattaro and the settlements under Venetian control, but became more challenging for the town of Ragusa and the smaller settlements in the rest of the Republic's territory, and critical for places in the bordering regions under the control of the Ottoman Empire.

Most of the data in the following discussion is taken from the documentation already mentioned, complemented by data gathered from other sources, preferentially those written in the years immediately before or after the earthquake.

What follows is an overview of the affected places for which the records collected were considered to be reliable. Each place is first described with respect to size and inhabitants, when such data is available, and then with respect to the impact of the earthquake. The settlements are ordered in an approximate north-south direction, and they are grouped according to their administrative pertinence in the year 1667.

For the benefit of the readers, the place names in the title of the paragraphs are given as originally mentioned by the sources in their 17th century spelling, followed by their modern, local version between parentheses.

3.2.2.1 Inside the Territory of the Republic of Ragusa

Because of its long history as an independent state in the heart of the Adriatic Sea, the Republic of Ragusa has long attracted the attention of the historians, at an international level, from a variety of different perspectives. Some of their books have been referenced throughout (e.g. Foretić 1980; Harris 2003), however, the capital Ragusa was described in greater detail in such studies than the rest of its territory.

It is out of the scope of this book to propose any abridged history of the Republic. For the purposes of this book, this overview begins from what happened on 6 April 1667 in its territory. Figure 3.2 supplies the names of the many villages that contributed to the life and prosperity of the Republic of Ragusa, in the good times, and which were more or less ignored by the central government in the difficult times following the earthquake.

Stagno Grande (Ston or Veliki Ston)

Located about 50 km to the north of Ragusa, inside a bay, Stagno Grande (literally 'Big Pond') was the seat of the largest saltworks of the Republic of Ragusa (Fig. 3.3). The name Stagno quite obviosly derives from its location, and it was named Grande in opposition to Stagno Piccolo ('Small Pond'), a fishermen's village on the other side of the steep hill closing Stagno Grande to the north.

In the coeval documentation studied, there is no mention of the number of inhabitants of Stagno Grande. When Petter wrote his "Compendium" on Dalmatia (1834), he described Stagno Grande as an unealthy swamp, the exhalations of which were causing tertian fever, a type of malaria. This disease affected the 200 inhabitants and could be detected from looking at their emaciated faces. There is

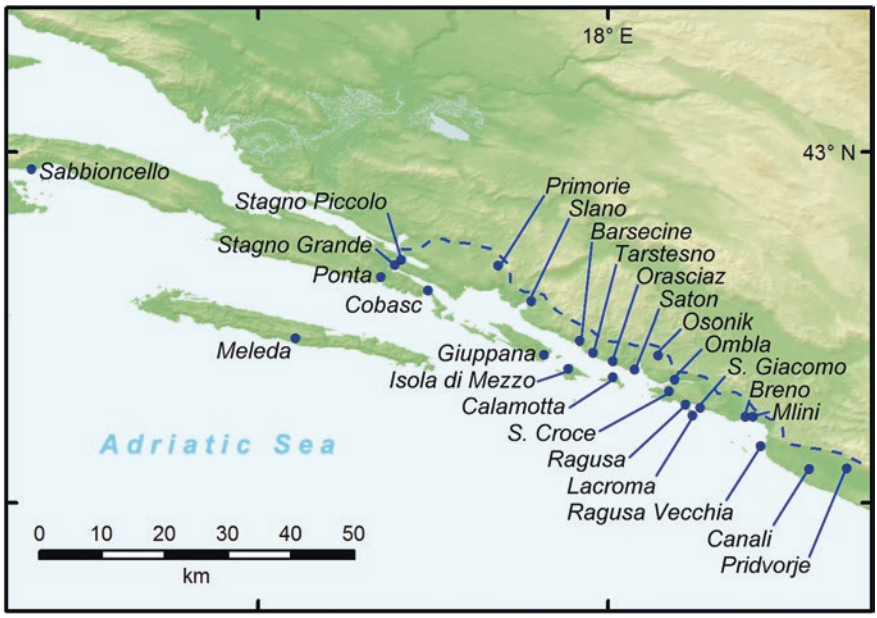

Fig. 3.2 The Republic of Ragusa and its main settlements in mid 17th century. The *dotted line* delimits, approximately, the territory of the Republic

Fig. 3.3 Stagno Grande and its saltworks, view from the walls (*photo* by AR, 2008)

no extant official population counting for the 17th century Republic of Ragusa with which to compare Petter's data. Consequently, his figures have to be taken as merely indicative. Excluding the modern buildings that can be seen to the left of the photo in Fig. 3.3, the layout of this settlement should not have looked much different in the year 1667.

Early in the morning of 11 April, Nicolò Bona and his family left Slano, where they had moved after abandoning Ragusa, towards Stagno Grande (see Fig. 2.4). Upon their arrival, at about 1.30 p.m. ("a hore 19", Italian style), they were welcomed "with great affection and compassion, by the count Francesco Paolo Gozze, who after the ruin of the public house had found shelter in that of the reverend Don Simone Mlinarich" (Doc#49). After having had something to eat and drink, Bona and his family were provided lodgings in the palace of the bishop of Stagno, Monsignor Pietro Lucari. The following day, Bona left his family and went back to Ragusa (see Chap. 2).

Severe damage is confirmed by the officer of the Republic of Ragusa Nicolò Bassegli (Doc#52). Some days later, on 24 April, in his letter to the Rettore and Consiglieri of the Republic of Ragusa, he wrote of himself that he was eager to reach the capital to help in the recovery actions, but that the adverse weather had made it impossible. About the impact on Stagno Grande, Bassegli wrote: "Qui anche questa città ha patito, e nelle case, e nelle slanize. Sarebbe bene d'ordinare al Conte che faci accomodare in quell meglior modo che si pole, aciò il sale non riceva danno, perché dubito che si prevagliarà di questa ocasione ogn'uno." (Here this place has suffered also, both in the houses and in the saltworks. It would be good to order the Count to fix the storehouses in the best possible way, so for the salt not to deteriorate or be stolen, as I suspect that many will try and profit of this situation).

Stagno Grande is described as heavily damaged by Veselicich (Doc#26), and in the first letter by Francesco Bobali (Doc#24; see Fig. 2.5, also), although with a concise statement. Bobali added details on this place in a following letter, written on 3 May 1667, after he had had time and occasion to collect first-hand information. He wrote of the buildings in Stagno Grande that "cascha la mettà, cioè tutto quello nel piano" (half of them collapsed, that is all which are in the low part of the town) (Doc#80) (Fig. 3.4).

To further confirm Bobali's testimony about half of Stagno Grande being in ruin, there is the letter written ten months after the earthquake, on 3 January 1668, by the count Zamagnio, then administering Stagno Grande. He sent a list of things that needed to be brought by boat from Ragusa (DADu 1668a), in order to please the nuns who had just returned to the Republic of Ragusa—the same nuns who had spent the past months in a convent close to Ancona (Italy), after abandoning Ragusa on board the same ship as the archbishop Pedro de Torres (see Chap. 2).

Some later documents confirm Bobali's description of some buildings having suffered serious damage; here are two examples:

- on 5 February 1668, on behalf of the "nuns of this area" the public officer, count Zamagnio asked the government of Ragusa for permission to restore a dwelling "where the Gipsy used to live, which because of the earthquake has

Fig. 3.4 Stagno Grande, a street in the low part of the town (see comment by Bobali). In the background the town walls (*photo* by PA, 2011)

just three walls still standing, and the front one is unstable and close to collapse […] the nuns offered to do this at their expenses, to fix the house and make it habitable" (DADu 1668b);

- on 28 October 1668, the chancellor of Stagno Grande, Francesco Gioelich acknowledged receiving the order from the government of Ragusa to leave the house belonging to a Biagio Armeno, where he had lived since the day of the earthquake. He also reminded them that "with great labour I salvaged from this public house, which was in complete ruin after the earthquake, about 300 Public Books, together with the cadastre and the wills […] after having been at the service of Your Excellences for 23 years and eight months" (DADu 1668c). Because of the overall condition of Stagno Grande, the chancellor Gioelich could not think of any other building, public or private, where he could move and store such a mass of public documents.

There is no information about deaths and injuries in Stagno Grande on the occasion of the earthquake, due to the lack of documentation.

Stagno Piccolo (Mali Ston)

This settlement is only mentioned in the 3 May letter by Bobali (Doc#80). In this letter, the earthquake's effects to this small village are compared with those in Stagno Grande, altough the effects were less severe at Stagno Piccolo, as Bobali used an ad hoc wording to say that it had been "spared" from heavy damage.

Giuppana (Sućurađ, Island of Šipan), Slano (Slano), Primorie (Podgora, Dubrovačko primorje), Meleda (Babino Polje, Island of Mljet), and Ponta (Prapatno)
After having pointed out that the 17th century Ragusans used the toponyms Giuppana and Meleda to indicate both the islands and their main villages, for these five small settlements, the only record available comes from the 3 May letter by Bobali (Doc#80; see Fig. 2.5). As in the case of Stagno Piccolo, they are said to have been "spared" by seriously damaging effects, in comparison with Stagno Grande, and other places inside the territory of the Republic of Ragusa.

Saton (Zaton), Orasciaz (Orašac), Tarsteno (Trsteno), Barsecine (Brsečine), and Osonik (Osojnik)
Of these five villages, some comprising of just a few houses, all that is known is extracted, again, from Bobali's letters. Osonik is mentioned in his 18 April letter only (Doc#24). On 3 May 1667, Bobali wrote for the first time from Cobasc, a place in the eastern part of the Sabbioncello (Pelješac) peninsula (see Fig. 2.5), where he had moved with his surviving relatives. These five settlements are located along the route Bobali took in his 'commuting' trips from Cobasc to Ragusa, where he went back to help in the emergency. This is how he collected his observations, later summarised in his letters.

After introducing his addressee to the pitiful sight with these words: "I assure Your Lordship that there is no language nor words that can possibly explain what has happened", Bobali continued his description of the earthquake's effects, and wrote that in Saton, Orasciaz, Tarsteno, Barsecine "there is no church nor house left untouched, and most of the houses fell down" (Doc#80).

For the two above mentioned groups of settlements, the records extracted from the correspondence of Francesco Bobali are the one and only description of the effects in ten settlements in the territory of the Republic of Ragusa, with the exception of Ragusa itself. None of these ten places had hitherto been included in any seismological study of the 1667 earthquake.

Isola di Mezzo (Lopud, Island and Place)
Located between the islands of Giuppana and Calamotta, the Isola di Mezzo, literally the Middle island, is part of the archipelago of the Elaphites, and was part of the Republic of Ragusa since it became independent. The village of Mezzo is located in a large bay to the north-west of the island. According to Petter (1834), the island, including the sparse buildings, counted up to 105 houses and 450 inhabitants.

The Isola di Mezzo is included in the observers' lists of the most damaged places, together with the town of Ragusa. Information on the effects are mostly contained in the documents written in the four weeks after the earthquake.

Direct observations were made by Vitale Andriasci, Francesco Bobali, and Caterino Cornaro (respectively: Doc#22; Docs# 24, 32, 80; Doc#25). Indirect information is supplied by Veselicich, and a leaflet published at the end of April, available in Italian, in French, and in English (respectively: Doc#26; Docs#73, 74, 75). Most of these observers condensed their observations in a few words, to report that the place of Mezzo was in ruin, and all the buildings had collapsed to the ground.

Unexpectedly, the most informative and least conventional description is not recounted by any Ragusan observer, but by Caterino Cornaro, the Venetian

Provveditore Generale in Dalmatia et Albania. On his way towards Cattaro, as narrated in the previous chapter (see Fig. 2.2, also), on 18 April Caterino Cornaro arrived in the harbour of Santa Croce. On board his galley, he wrote a dispatch to inform the Senate in Venice that the news he had learnt from the testimonies of the Venetian envoys from Cattaro about the devastation of Ragusa corresponded to the reality which he had observed by himself. Thus, Cornaro could add that "greater and greater appear the signs of the disaster they actually suffered". In this scenario, "Anco l'Isola loro detta di Mezzo ha provato simil disgrazia, cadute tutte le Case, né preservatesi che sole quaranta Donne, un'Huomo, et un Putto" (Also the Island they call Middle experienced the same misfortune, all the houses having collapsed to the ground, and forty women, one man, and a small boy only have lived through the earthquake) (Doc#25).

Calamotta (Koločep, Island and Place)

Having been inhabited since antiquity, the small island of Calamotta was adorned by churches, and provided with a safe harbour and an important shipbuilding site. According to Petter (1834), there were 67 houses for 325 inhabitants. They seem to have decreased further since the early 19th century, if one does not consider the people crowding its famous sandy beach in the tourist season.

This place was often mentioned in the previous chapter (see Figs. 2.1, 2.2 and 2.5). Being the closest island to the town of Ragusa, even closer to the harbour of Santa Croce, Calamotta became the meeting point of the surviving Ragusan inhabitants, who were forced to leave the walled town in ruin, and search for shelter.

Like the Isola di Mezzo, this island is on the Adriatic Sea route to-and-fro Ragusa. Consequently, many records are available on the earthquake's impact on Calamotta, mostly written by the same people who moved there or passed through in those difficult days. The reporters were the archbishop Pedro de Torres, Andriasci, Squadro, Bobali, the anonymous visitor from Venice, and, though indirectly, Veselicich (respectively: Doc#4; Doc#22; Doc#16; Doc#24; Doc#21; Doc#26).

There are only two really informative records on Calamotta, that by Biagio Nicolò Squadro (Doc#16), and that by the anonymous observer (Doc#21).

Writing to his uncle, probably residing in Venice, Squadro wrote that "li nostri à Calamotta sono tutti salui, nè ui sono iui morti che dua, ò tre Persone, la mia casa è restata quasi intatta, mà quelle di V.S. assai daneggiate, e la chiesa è cascata à fondo for che la capella doue si conserua il Santissimo." (our dear ones at Calamotta are all safe, and in that place only two or three people have died, my home is nearly intact, but the houses of Your Lordship are greatly damaged, and the church has collapsed to the ground, except for the chapel where the Blessed Sacrament is kept) (Doc#16).

It was on the island of Calamotta that the Easter Mass of Sunday 10 April was officiated. Our anonymous observer described the scene thus: "Li scogli vicini et Isole tutte sono estrapate. Domenica fummo alla Messa ad un scoglio, che si chiama la Calamota, anco questo è sradicato; né altro è resto in piedi, che il Tabernacolo del Santissimo." (All the islets and the islands nearby [*the harbour of*

Santa Croce] have been eradicated. On Sunday we attended the Holy Mass on an islet, called Calamota, and this as well is uprooted; nothing was standing anymore, except for the tabernacle of the Blessed Sacrament) (Doc#21).

As in the case of the Isola di Mezzo, there is no further reference to Calamotta after the end of April 1667.

Ombla (Rijeka Dubrovačka, Mokošica and Rožat)

The 17th century Ragusans used the toponym Ombla, which is in fact a river with a short course, to indicate the area of Rijeka Dubrovačka (River of Dubrovnik), to the north of the walled town of Ragusa.

The humanistic philosophy that underlined the importance of experiencing the beauty and pleasantness of life in a countryside retreat, out of the walled towns, has influenced the noble Ragusan families since the 14th century. Though there are such villas spread all over the territory of the Republic, Ombla became soon a favorite location, for its proximity with the town of Ragusa. There, the noblemen built their villas or "palazzi di delizie" (palaces of pleasures), embellished with gardens, a tradition that continued throughout the Renaissance period until the fall of the Republic (Grujić and Fabianić 2003).

Ombla is placed in the list of the damaged settlements by Vitale Andriasci in his 16 April letter (Doc#22), and by Francesco Bobali in his 18 April one (Doc#24).

The first overall view is that by Caterino Cornaro, who was collecting information while at anchor in Santa Croce on his way to Cattaro: "diroccati i Pallazzi […] distrutti quei che sono nella fiumara, delicie, e commodi di quei cittadini, tutti precipitati; nè che possan rimettersi come si van lusingando, se non con tempo longhissimo, vi è apparenza, o può così ben figurarsi" (in ruins the palaces […] destroyed those in the river, pleasure and comfort of those citizens, they are all completely collapsed to the ground, and there is no way, as they brag about, that they will be able to restore them, but in a long time, as it looks, or it can be guessed by looking at the state of their disrepair) (Doc#25).

Two independent records, both written on 21 April supplied an account along the same lines, one by Bernardo Giorgi (Doc#31) and one by Francesco Bobali (Doc#32). The latter wrote: "In Ombla [*Bobali switched language and used the word "Riezi", river*] I have looked for the house of Sir Zamagnio, and one cannot see it nor recognise where it was, and the same for the dockyard of Sir Bernardo Giorgi. All the houses collapsed everywhere, not one is still standing". According to Giorgi, half of the garden of the house of Zamagnio, spelt Zamagna, was swallowed by the sea. Later on, Bobali (Doc#80) repeated the same observation, modifying it by adding that at least two houses were not in complete disrepair, though they had suffered because of the shaking.

From a later source referring to contemporary sources (Cusmich 1864), it is learnt that one Franciscan friar, the guardian of the "elegant" Franciscan monastery of Ombla, Father Bonaventura from Ragusa, lost his life while celebrating Mass.

Santa Croce di Gravosa (Gruž)

Situated at the end of a large and protected bay, Santa Croce di Gravosa was in an excellent position to become the harbour of the thriving town and Republic of

Ragusa. The dwellings along the coast were mostly villas to be used as summer residences, of the same type of those described for Ombla.

On the occasion of the earthquake, it became shelter to the many citizens leaving the town, and its situation after the earthquake was mostly described by those at anchor or passing by (see details in Sect. 2.1), such as Vicenzo Giumeta and Triffon Drago from Cattaro (Doc#11 and Doc#13, respectively), or Nicolò Bona (Doc#49).

The most informative records are extracted from two letters of Francesco Bobali (Docs#24 and #80), and from the dispatch containing the direct observation of Santa Croce made by Caterino Cornaro (Doc#25) while he was at anchor in the harbour, prevented by the adverse winds to continuing his journey (see details in Sect. 2.1).

"Here everything is a pathetic sight, in ruins are the palaces, which in great number surround the harbour", wrote Cornaro, and Bobali echoed: "in Gravosa only the houses of Marco Sorgo and Mixich, and part of the monastery of Santa Croce are habitable".

There is no further reference to effects in Santa Croce after the end of April 1667.

Ragusa (Dubrovnik)

The "Pearl of the Adriatic" is one of the nicknames of Ragusa, which was included in the UNESCO list of World Heritage Sites in 1979.

There are different theories on the foundation of Ragusa, some relying almost too heavily on presumed mythical origins. Much has been written about its connections with Epidaurum in Dalmatia, a settlement inhabited since prehistoric times, and later identified with Ragusa Vecchia (Carter 1972; Foretić 1980; Harris 2003, and his references). With a giant leap in time, the history of Ragusa becomes less uncertain and well-rooted in the surviving documentation. Gaining autonomy from the Byzantine control was a slow and troublesome process, but in the year 1272 the commune of Ragusa composed and enforced their first statutes. This was the starting point of the way towards independence of the already flourishing commercial community of Ragusa, a tendency that not even under the rule of the, ever competitive, Republic of Venice between 1205 and 1348 could dampen.

After "a kind of independence" under the dominion of Hungary (Harris 2003), in around 1430 Ragusa declared itself independent. Though around the same time Ragusa started to pay to the Sublime Porte an annual tribute, it considered itself autonomous from the its neighbours, introduced at the very start of this book, and went its own way until the fall of the Republic in January 1808.

Several essays have discussed the role the 1667 earthquake had in the decline of the Republic of Ragusa, either from the point of view of the problems inflicted to the Republic's institutions, such as the Senate, the Great and Small Councils, by the loss of many noblemen on the very day of the earthquake; or the heavy consequences the earthquake had on the finance and economy of the maritime republic (Di Vittorio 1983). Also, the population of the Republic was drastically reduced by the earthquake in itself, and the emigration flux that followed (Vekarić 1998).

There is no agreement amongst scholars on the population of the town and surrounding settlements within the territory of the Republic of Ragusa, nor on the

exact number of dwellings inside the walled town. The figure of 30,000 inhabitants suggested by sources contemporary to the earthquake are definitely exaggerated, but it is also equally unlikely that there were 6,000 inhabitants inside the walled town and 500 outside it (on this aspect see more in Harris 2003).

The previous studies on the 1667 earthquake gave quasi-exclusive attention to the earthquake's effects in Ragusa, so much so that the earthquake of 6 April 1667 is commonly known, to date, as "the Great Ragusa earthquake", as indeed it was called by Giessberger (1913; see Sect. 1.2 and Fig. 1.4). In reality, Ragusa had experienced heavily damaging earthquakes before: the earthquake of 17 May 1520 (Albini 2004), whose memento is still visible in the stone epigraph located on the façade of the church of San Salvatore, close to the section of town walls towards the Pile Gate; and later, on 15 April 1979 (Anicic et al. 1980).

In addition to a map of the effects of the 1667 earthquake, Mihajlović (1947) proposed a detailed analysis of the damage inside the town, and mapped it on a reconstructed plan of Ragusa as it should have been soon before the earthquake. This map is Figure 1 of Mihajlović's work, and it comes as a loose annex to the journal that published his paper. The same map of damage was proposed again, in a simplified way, by Carter (1972).

The plan of Ragusa used by Mihajlović was extracted from the "Veduta" of an anonymous painter of the first half of the seventeenth century (Fig. 3.5), which is reproduced here in black and white from Kowalczyk (1909). Though the quality of the painting is not good, it has a great documentary value as it depicts, in a

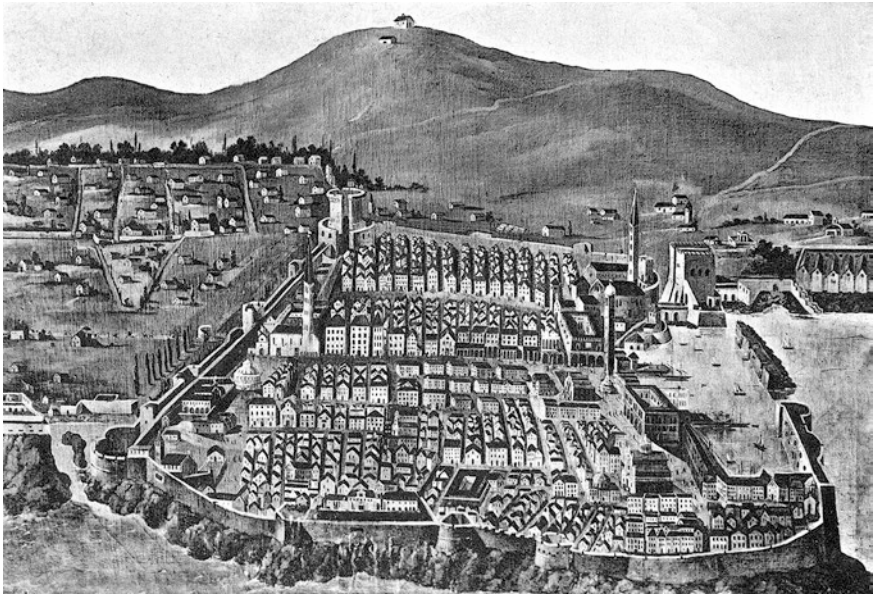

Fig. 3.5 "Veduta" of Ragusa by an anonymous painter of the first half of the seventeenth century (from Kowalczyk 1909)

realistic way, the town as it was before the earthquake, including buildings and churches that were destroyed by the 1667 earthquake (Gjukić-Bender 1999–2000; "Stjepan Gradić otac domovine", 2013). This same painting has been used in previous attempts at recontructing the earthquake's effects in Ragusa and has been presented in international conferences (e.g. Albini et al. 2009).

Reconstructing minutely the damage suffered by the different types of buildings is beyond the scope of this study. There are meticulous and recent studies that have considered the conditions of the buildings in the wake of the earthquake, from the archaeological, architectural and engineering perspectives (e.g. Horvat-Levaj and Seferović 2006; Žile 2008). In 2013, on the occasion of an exhibition dedicated to the life and works of Stefano Gradi ("Stjepan Gradić otac domovine", 2013), these combined efforts resulted in a two-minutes video reconstructing in 3-D the occurrence of the 1667 earthquake, and its destructive effects on the town of Ragusa.

As much as the availibility of a few records can impact on the earthquake interpretation, an abundance of the sources of information also complicate the analysis. As evident from Fig. 3.1, this is the case for the town of Ragusa, where the number of reports and observations collected are so numerous to become almost overwhelming.

Also, the records describing what happened inside the walls of Ragusa are literally scattered in documents spanning several years, as it was proven by the collection of documents published by Samardžić (1960) (see Sect. 1.2), covering the period from 6 April 1667 to 1670.

The content and style of the reports of the many Ragusan eyewitnesses of the earthquake have already been discussed in the previous pages (see especially Sect. 2.1). In contrast to Cattaro, described further in this chapter, there was no survey of the damage suffered by the town dwellings, or by the churches, or by the public buildings of Ragusa. These records may or may not have existed, but they were not found during this extensive study.

This, in turn, created consistent problems in the analysis, comparison and interpretation of the accounts of damage and then trying to evaluate it in terms of the variety of building types in Ragusa. In other words, to extract the records that have a sound seismological significance was much more difficult for Ragusa than for the other damaged places, despite the multitude of reports and observations. To report here long excerpts of the original texts would only recreate in the reader the same confusion, or dizziness that I experienced when I evaluated all those "voices" talking at the same time, trying to overcome each other, and make one's opinion and observation prevail.

The aftermath, as it was experienced in Ragusa, was dramatic for several reasons, but especially because almost immediately after the earthquake a devastating fire spread though the city, and added to the devastating ruin caused by the earthquake (Fig. 3.6). It hampered the rescue operations, thereby increasing the number of the people who died under the ruins as they could not be rescued before the flames reached them. The fire was fanned by an unusually strong wind, and lasted for ten to fifteen days, as narrated by many eyewitnesses, such as Bobali (Doc#24), Bona (Doc#49) and Giorgi (Doc#106), to name just a few.

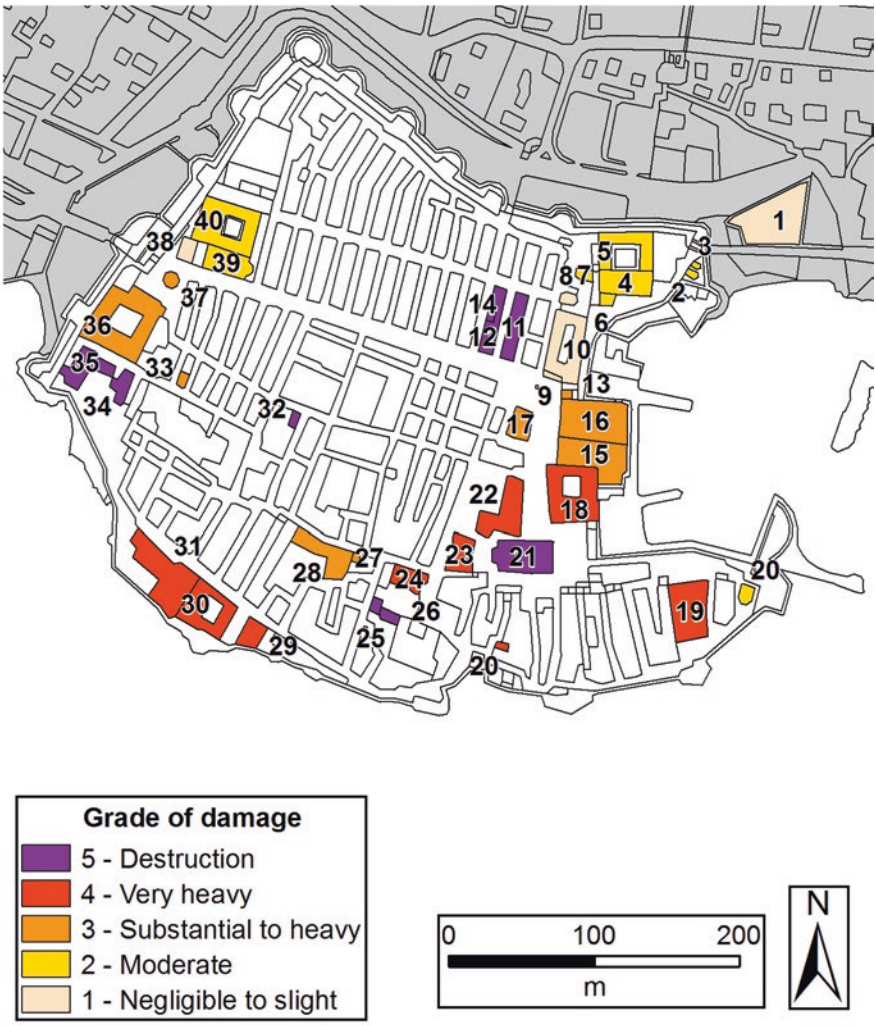

Fig. 3.6 Damaged buildings inside the town of Ragusa. The grades of damage are according to the European macroseismic scale 98-EMS98 (Grünthal 1998). *1* Revelino; *2* S. Luca, church; *3* Plocce, gate; *4* S. Domenico, church; *5* S. Domenico, monastery; *6* S. Sebastiano, church; *7* B.V. del Santissimo Rosario, church; *8* S. Nicola, church; *9* Loggia; *10* Sponza or Dogana; *11* and *12* Ghetto; *13* Torre dell'orologio; *14* Sinagoga; *15* Palazzo del Consiglio; *16* Arsenale; *17* S. Biagio, church; *18* Palazzo del Rettore; *19* S. Tommaso (Pustijerna), nunnery; *20* S. Stefano, church; *20* N.S. del Carmine, church; *21* Cathedral; *22* Archbishop Palace; *23* Battistero; *24* S. Michele Arcangelo, nunnery; *25* Santa Croce, church; *26* S. Lucia; *27* S. Pietro, church; *28* S. Caterina, nunnery; *29* S.S. Apostoli, nunnery; *30* S. Simone, nunnery; *31* S. Maria, nunnery; *32* S. Giuseppe, church; *33* S. Rocco, church; *34* S. Andrea, nunnery; *35* S. Marco, nunnery; *36* S. Chiara, nunnery; *37* Fontana di Onofrio; *38* S. Salvatore, church; *39* S. Francesco, church; *40* S. Francesco, monastery

Table 3.2 Location and number of the victims inside Ragusa specifically mentioned by the sources

Location or building	Number of deaths	Source
Ghetto	39, 19 men, 20 women	Miović (2005, p.106)
San Francesco (monastery)	Father Mattia da Canali	Dolci (1746)
Cathedral	36 Clerics	Giorgi (Docs#30, #31)
San Marco (nunnery) aka San Bartolomeo	All the nuns (number not given) and Maria, wife of Francesco Sorgo	Samardžić (1960, p. 303)
Palazzo del Rettore	53 Councilors	Giorgi (Doc#31)
Archbishop Palace	1 Cleric	Squadro (Doc#16)
Palaces destined to the diplomatic delegations (their location is not known) • Residence of the Dutch delegation, Croock • Residence of Iacob van Dam • Residence of Hardin	20 to 30 People (see Sect. 2.1)	Iacob van Dam (Doc#62)
Town dwellings, of different standards	70 to 100 People	Bobali (Docs#24, #80) Bona (Doc#49)

The fire was observed from the sea by the Venetian officers travelling the Adriatic Sea (see Sect. 2.1, and Fig. 2.2), and mentioned in their reports. It became a characteristic element of the images depicting Ragusa before and after the earthquake; for example, the very famous image attributed to Mattheus Merian, titled "Erschröcklicher Untergang und Uerbrennung der Statt Ragusa" (Terrible destruction and fire of the town of Ragusa), published in "Theatrum Europaeum" (1677).

The fire, in addition to the earthquake, associates the aftermath in Ragusa with that of two other cities that were also devastated by earthquakes, closely followed by fires: Lisbon, on 1 November 1755, and San Francisco, on 18 April 1906.

To make the situation even worse, as if it was possible, Ragusa was then invaded from outside by plunderers, freely entering a completely defenceless town, while corrupt noblemen pocketed the money from the opened state coffers.

Fire and plundering could not escape the attention of the authors of the accounts written in the wake of the earthquake. These aspects are interspersed with the many, emotionally moving, stories of rescue and death, and with the first actions towards recovery. In all, that the situation was extremely serious is apparent from any and all the statements, letters and documents.

Altough the following may sound like a cynical and insensitive comment, this chaos affected the content of the reports substantially. In the course of the interpretation of the records for seismological purposes, progress was hampered by trying to dissect the records to extract what damage was actually caused by the earthquake alone.

What follows is essentially a synthesis of the plethora of data available, and presents a revised, with respect to Mihajlović's interpretation, map of the distribution of the grades of damage, according to EMS98, within the town of Ragusa (Fig. 3.6).

The map is supplemented by a table (Table 3.2) listing the victims of the earthquake, whose location in a specific place is provided by the records themselves.

This combination of information also provided further insight to the damage within the city, by confirming that most severely damaged buildings, in terms of structural damage, were accurately identified and correspond to the buildings, under the ruins of which, many inhabitants of Ragusa died.

Lacroma (Lokrum, Island of)
This small island in front of the harbour of Ragusa, to the east of the town, was the seat of a Benedictine abbey. There are remains of the abbey still visible, but no specific documents were found describing the earthquake's effects that could be used to assess any macroseismic intensity. It is mentioned here for the sake of completeness.

S. Giacomo di Visegnizza (Sveti Jakov u Višnjici)
The Benedictine abbey of San Giacomo marked the border of the administrative jurisdiction of the town of Ragusa towards the east. This is reaffirmed in the resolution by the first emergency council held on 11 April (Doc#9).

The only independent record on this location was found in the published leaflet entitled "Relatione dell'horribile Terramoto" (Doc#73), which listed the abbey among the seriously damaged locations.

Breno (Srebreno)
A small settlement to the south-east of the town of Ragusa, Breno is mentioned by Francesco Bobali in his 18 April letter (Doc#24). It is included in a list of heavily damaged places, located within the territory of the Republic, to the south and to the north of the town of Ragusa.

Ragusa Vecchia (Cavtat)
According to Degenfeld, introduced in Sect. 1.1, Ragusa Vecchia was at that time "a small town, only a village, and where it grows a delicious Malvasia" (Degenfeld 1670 *ca*). Petter (1834) described it as a village enclosed by walls, situated at the end of a bay.

Veselicich (Doc#26) listed Ragusa Vecchia among the severely damaged places, and the same did Francesco Bobali (Doc#80), who wrote that from "Zaptat" (Ragusa Vecchia in Dalmatian) towards Ragusa there were no houses nor churches that had been left intact.

Canali (Čilipi) and Pridvorje (Pridvorje)
Also smaller than Ragusa Vecchia was the settlement of Canali, located to the south-east of Ragusa in the area of Konavle, not far from a group of houses pertaining to Pridvorje, the seat of a Franciscan monastery (Fig. 3.7).

Two letters of Francesco Bobali (Doc#24 and Doc#80) included Canali in the same list of the damaged places in which was included Ragusa Vecchia.

The information of damage suffered by the Franciscan monastery at Pridvorje, then called also the monastery of Canali, is indirectly supplied by Dolci (1746). In his chronicle of the Franciscan in the province of Ragusa, for which he drew upon coeval documentation, he wrote: "F. Modestum a Terranova, & F. Juniperum a Puncta

Fig. 3.7 Franciscan monastery at Pridvorje (*photo* by PA, 2011)

laicos oppressit Conventus Canalium" (the lay fathers Modestum from Terranova and Juniperum from Ponta died under the ruins of the monastery of Canali).

3.2.2.2 Under the Rule of the Republic of Venice

The bay known as Bocche di Cattaro, in today Montenegro, is situated in the southern part of the area affected by the 1667 earthquake. It comprised the majority of the settlements then under the control of the Republic of Venice. Such settlements are indicated in the bird's-eye view of Fig. 3.8.

Cattaro (Kotor)
Cattaro was probably established around the 8th century, and owed its increasing importance to its strategic location at the very end of the bay with the same name (Fig. 3.8). Built on a narrow strip of land closed to the east by a steep mountain, the walled town of Cattaro projects itself towards the waterfront. The defensive walls hang on the mountain slope, are topped by a castle, and have been for centuries the only physical separation from the incumbent Ottoman neighbour. Compared with the town of Ragusa, then and of today, Cattaro is a smaller settlement, but densely built and inhabited (Fig. 3.9).

The Old Town of Cattaro, its fortification and the inner part of the Bocche di Cattaro, including Perasto, and the two islets Scoglieto di San Zorzi and Scoglieto della Madonna, form the UNESCO World Heritage Site, inscribed in 1979 with the name "Natural and Culturo-Historical Region of Kotor".

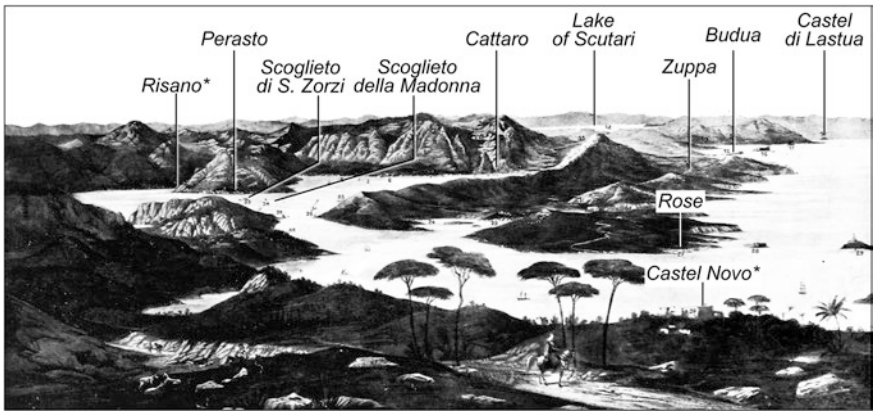

Fig. 3.8 Bocche di Cattaro and Venetian Albania in a bird's-eye view from the north (from Viscovich 1898, modified). In spite of their location, Castel Novo* and Risano* were under Ottoman rule in the year 1667

Cattaro was part of the Venetian Albania from 1420 to 1797. The town was administered by a Provveditore Estraordinario, a middle-ranking officer, appointed by the Senate in Venice. In April 1667, the Venetian Provveditore Estraordinario was Giacomo Loredan, one of the "earthquake observers" (see Chap. 2). It is from his official report at the conclusion of his mandate (ASVe 1669) that one can learn that Cattaro had about 1,230 inhabitants, distributed among four categories of census, and details on the livestock:

	Men at arms	Old people	Boys	Girls and women	Big livestock	Small livestock	Horses
Cattaro	304	13	215	698	–	–	3

The importance of Cattaro is testified by the several documents mentioning it among the places most affected by the earthquake. For their level of detail and reliability, the descriptions supplying the most significant records on the earthquake's impact on the town were selected, and are thoroughly analysed. Among them, three are from the independent observations of eyewitnesses that happened to be inside the walled town when the earthquake occurred (see Chap. 2), and namely: Giacomo Loredan (Doc#2 and Doc#3), Vicenzo Giumeta (Doc#11), and Triffon Drago (Doc#13).

To these descriptions, immediate and conditioned by emotions, has to be added the—more detached—survey by the engineer Vicenzo Benaglio, delivered on 21 April (Doc#29). Benaglio started off with a statement that is worth mentioning:

"Io con l'occhio proprio ho veduto, et diligentemente osservato il tutto" (I have seen with my own eyes, and diligently observed everything).

In Table 3.3, the informative content of the first survey by Benaglio is compared with and complemented by the observations supplied in the dispatch written by the Provveditore Generale Caterino Cornaro (Doc#33), also dated 21

Fig. 3.9 A street in Cattaro (*photo* by PA, 2011)

April, on his arrival in Cattaro. The observations appearing only in the documents by Loredan, Triffon Drago and Vicenzo Giumeta are also added, for the sake of completeness.

Merging and comparing the records selected, a general view of the damage inside the town of Cattaro was reconstructed, and the religious and public buildings that could be identified with those mentioned in the documents are highlighted in a modern plan of the town of Cattaro. Table 3.3 includes also the description of damage to structures that are not displayed in the figure (Fig. 3.10), such as the Castle, and buildings that were not identified, such as the Church of the Carmine.

The town of Cattaro and all of its built structures were severely damaged. Damage was suffered by the defensive structures, both walls and bastions; the ecclesiastical buildings, both monasteries and churches; the municipal buildings as well as the private houses.

As in the case of the town of Ragusa, there are only summary details on the private dwellings, both the palaces of the noble families and the less elaborate homes. These buildings are mentioned by the two envoys Triffon Drago and Vicenzo Giumeta, who left Cattaro soon after the earthquake (see Chap. 2). Drago reported that "three soldier quarters, as well as private houses, in all two thirds of the buildings" had been seriously damaged (Doc#13). Giumeta stated that "inside the Town about half of the buildings have collapsed" (Doc#11).

In writing his survey on 21 April, after the passage of time since the previous two observations, engineer Benaglio (Doc#29) proposed a less generic description:

"Habitationi: cinque parti, tré ne sono cadute; Una risentita, e l'altra è restata illesa, ch'è quella verso il Gordichio." (Dwellings: out of five parts, three have collapsed, one was damaged, and the remaining part is undamaged, and this is the one close to the Gordicchio bastion) (see No 11 in Fig. 3.10).

Together with engineer Tomaso Moretti, the engineer Benaglio produced two further reports, the first dated 22 April and the second 1 May, on the progress of the measures taken to restore the damaged defensive walls and structures (Doc#42 and Doc#76). The engineers' attention was captured by the town walls (Fig. 3.11) and their reparation, on the one hand because the walls were the borders with the Ottomans, on the other hand because this was the mandate they had been charged with by Caterino Cornaro.

"Sotto le rovine […] sono stati miseramente seppolti molti habitanti, e militie" (Under the ruins, many inhabitants, and soldiers were miserably buried) wrote Loredan in his first letter written the day after the earthquake (Doc#3). Both in his subsequent letters and in his final report, he largely reported, and complained, on his own misfortune, and never mentioned how many inhabitants of Cattaro lost their lives on 6 April 1667. These details are found in the "Constituto", or report, of the observer Vicenzo Giumeta (Doc#11), who left Cattaro on 7 April, as already mentioned.

According to Giumeta, on that day, 29 soldiers on guard duty at the "Marina" military post had died, as well as others residing in the Castle; the house master at Loredan's residence, and 200 women and children suffered the same fate. Giumeta added that in the nunnery close to the "Chiesa degli Angeli" (No 16 in Fig. 3.10) "all the nuns but two" had died, but how many nuns were in the convent prior to the earthquake is not known. The remark made by Caterino Cornaro two weeks later (Doc#33) that "three nuns died" does not provide clarification.

Table 3.3 Damage in Cattaro according to Benaglio and Cornaro

No in Fig. 3.10	Location	Survey by Vicenzo Benaglio (Doc#29)	Dispatch by Caterino Cornaro (Doc#33)
	Castle	Situated in the highest part of the walls, the part of the walls enclosing it on the side of the Vallone [to the south east] mostly fell and the rest is damaged	Part of the walls collapsed
		The Church [inside the castle], the house of the most honorable Castellan, the quarters of the soldiers and fuciliers, and the depots have fallen	The Church collapsed, the dwelling of the most honorable Castellan, the quarters of the soldiers, and the depots of arms and munitions
		The cisterns are cracked, and the square's floor has many cracks	Damage to the cistern
	Old walls encircling the hill to the side of Spigliari [East], which join with the town walls towards the "Fiumara" [North]	Collapsed in many places, and the rest are on the brink of collapsing, or slightly damaged	
11	Walls encircling the mountain towards the Vallone above the Gordichio [bastion]	Only very slightly damaged	No damage, the walls are safe
	Curtains, the Soranzo fortified tower	"They did not suffer as they are located along the outlets of the earthquake, and the caves of the mountains from where the water springs out"	
2	Bembo bastion	*As above*	
1	Small bastion Pedochio	*As above*	
4	Walls on the Marina	"They are opposed and transverse to the underground outlets of the mountain, and for this reason they mostly collapsed, or are close to collapse"	
	Harbour	It is full of cracks and sloping towards the sea	

(continued)

Table 3.3 (continued)

No in Fig. 3.10	Location	Survey by Vicenzo Benaglio (Doc#29)	Dispatch by Caterino Cornaro (Doc#33)
3	Quarters of the soldiers at the gate of Marina		In ruin
5	Gate at Marina		One could not enter or leave by the gate itself, only through a breach in the walls
	Lazzaretti at Marina		[*Heavily damaged, according to Loredan,* ASVe 1669]
10	Military hospital		[*Totally collapsed, according to Loredan,* ASVe 1669]
12	Cathedral of S. Trifone		Its facade and the two belfries collapsed
13	Church of the Franciscans of S. Clara		Partly collapsed and partly in a very bad state
14	Church of S. Nicolò of the Dominicans		Damaged in the choir and the Chapel, only the monastery walls are still standing
15	Church of the Friars Minor known as of the Holy Spirit		It has no damage, but the hospice is in complete ruin
16	Church of the Angels		Together with the convent where some nuns lived, it opened and partly collapsed.
17	Church of our Lady of the River		In a very bad state
	Church of the Carmine		In a very bad state
9	Palace of the Venetian Rector		Completely collapsed
7	Palace of the Venetian Provveditore Estraordinario Loredan		Completely collapsed [*according to Triffon Drago, only half of the palace had collapsed* (Doc#13)]

(continued)

Table 3.3 (continued)

No in Fig. 3.10	Location	Survey by Vicenzo Benaglio (Doc#29)	Dispatch by Caterino Cornaro (Doc#33)
8	Food warehouses		They were under the palace, they stored a lot of "biscotto" (the Venetian staple food), and they suffered damage [*according to Vicenzo Giumeta, the roof opened, the tiles flew around and inside the warehouse, and may cause the decay of the provisions* (Doc#11)]
6	Arsenal		Completely collapsed
18	Clock tower		[*Heavily damaged, according to Triffon Drago* (Doc#13)]

Observations appearing only in the documents by Giacomo Loredan, Triffon Drago and Vicenzo Giumeta are inserted in italic and between square parentheses in the *column* devoted to Cornaro's dispatch. Numbers refer to locations in Fig. 3.10

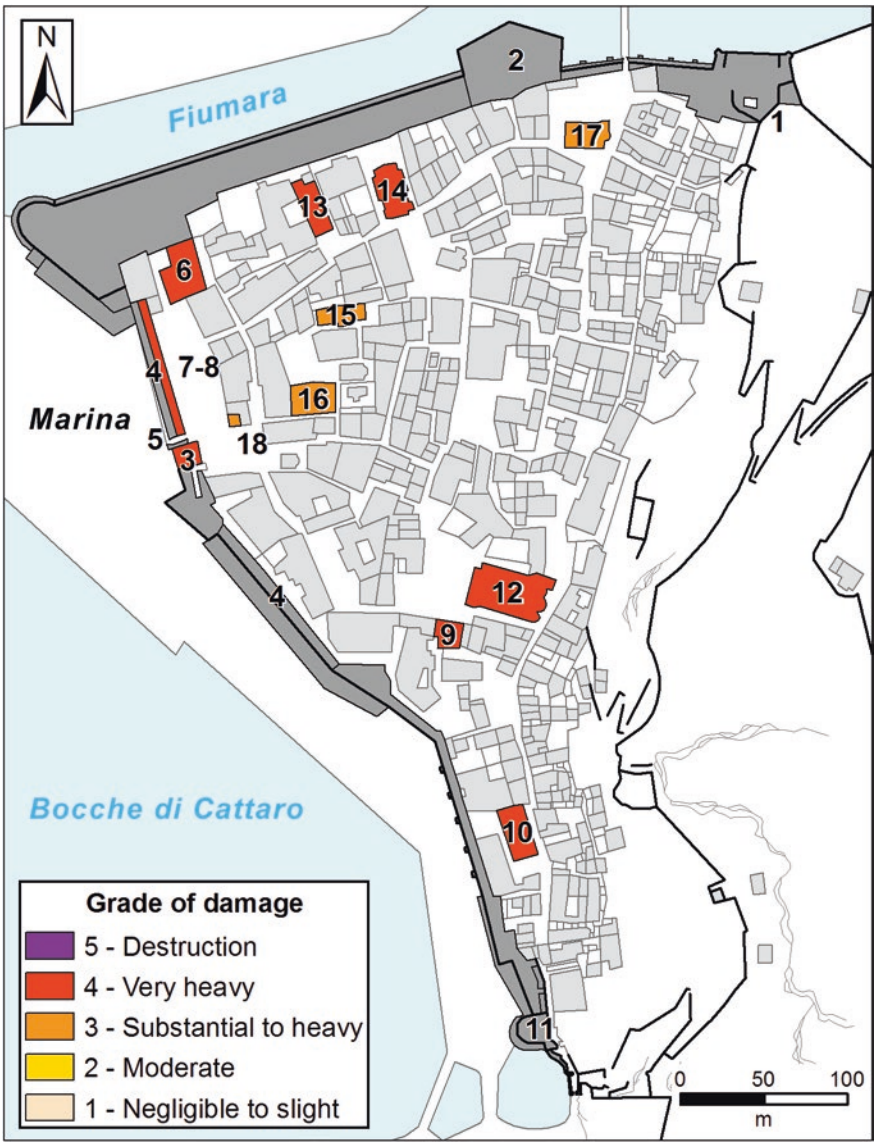

Fig. 3.10 Damaged buildings inside the town of Cattaro. The grades of damage are according to the European macroseismic scale 98-EMS98 (Grünthal 1998). Numbering is the same as in Table 3.3, recalled below for the readers' convenience. *1* Small bastion Pedochio; *2* Bembo bastion; *3* Quarters of the soldiers at the gate of Marina; *4* Walls on the Marina; *5* Gate at Marina; *6* Arsenal; *7* Palace of the Provveditore Loredan; *8* Food warehouse; *9* Palace of the Venetian Rector; *10* Military hospital; *11* Gordichio bastion; *12* Cathedral of S. Trifone; *13* Church of the Franciscans of S. Clara; *14* Church of S. Nicolò of the Dominicans; *15* Church of the Friars Minor known as of the Holy Spirit; *16* Church of the Angels; *17* Church of Our Lady of the River; *18* Clock tower

Fig. 3.11 The northern walls of Cattaro (*photo* by PA, 2011)

Cornaro updated the report by Giumeta about the 29 soldiers who supposedly died at the "Marina" military post, by writing that "rimasti coperti tutti i soldati che eran di guardia, hanno con la prottezion del Signor Dio potuto frà balconi, e ferrate trovarvi lo scampo, non mortine che soli nove" (all the soldiers on guard duty having been buried, by Lord God's mercy and crawling through balconies and iron bars, they succeeded to escape, and only nine of them died).

The news about the earthquake reached Venice on 21 April (see Sect. 2.2). The following day, the Senate in Venice officially received the dispatches from Giacomo Loredan and Caterino Cornaro, acknowledged the disaster, and the extraordinary needs of the faraway Venetian territorial possessions. With a series of deliberations (22 April, Docs#37, 38, 39 and 5 May, Docs#82, 84, 85) they supplied Cattaro and his Provveditore with an extraordinary funding for the reconstruction.

An amount of 250–300 people dead in a town counting approximately 1,300 inhabitants confirms that the earthquake represented "an accident to be remembered, and that made the town of Cattaro a tragic and pathetic sight" in the very words, written two years later, of the former Provveditore Estraordinario Giacomo Loredan (ASVe 1669).

Perasto (Perast) and Scoglieto di San Zorzi (Sveti Đorđe)

Facing the entrance to the Bocche di Cattaro (Fig. 3.8), the village of Perasto announces itself to the traveller with the slim silouette of its uncommonly high church belfry. Off the coast in front of it, lies an islet named Scoglieto di San Zorzi (Rock of Saint George), occupied by a Benedictine abbey and the graveyard of the Perasto nobles (Fig. 3.12).

Fig. 3.12 Perasto (*left*) with the Scoglieto di San Zorzi in the foreground (*photo* by PA, 2011)

According to Loredan (ASVe 1669), Perasto had 356 inhabitants, distributed as follows:

	Men at arms	Old people	Boys	Girls and women	Big livestock	Small livestock	Horses
Perasto	103	–	62	191	–	–	–

The available descriptions of the effects place Perasto among the damaged places, and proceed from the observations made by

- the Provveditore Estraordinario in Cattaro, Giacomo Loredan (Docs#2 and #3)
- Vicenzo Giumeta and Triffon Drago from Cattaro (Doc#11, and Doc#13, respectively)
- the Provveditore Generale Caterino Cornaro (Doc#33)
- the merchant Veselicich in his letter (Doc#26), the leaflet entitled "Relatione dell'horribile terramoto", together with its French and English translations (Docs#73, 74, 75).

In his letters of 7 April, Loredan plainly reported that, like Cattaro, "the same disgrace I have been informed was suffered by Perasto".

The two observers from Cattaro, Giumeta and Drago are in agreement in their reports, with Giumeta detailing as follows:

"A Perasto sono anco cadute alcune case, et al. Scoglieto di San Zorzi, dove si trovavano diverse persone pur di Perasto andate per occasione di dar sepoltura ad un cadavere, sono rimasti soffocati sotto la Chiesa vinti otto di loro; essendo rimasti gravemente offesi l'Abbate, et il Capitanio di Perasto; et si fà conto che in quel luoco fra tutti sono morte circa quaranta persone." (In Perasto also some houses have fallen, and on the Scoglieto di San Zorzi, where many people also from Perasto were assembled on the occasion of a funeral, twenty eight of them have suffocated under the ruins of the Church; also, seriously injured were the Abbot, and the Captain of Perasto; and all in all in that place 40 people died) (Doc#11).

The news about what had happened on the Scoglieto di San Zorzi were told to Triffon Drago by the son of the Venetian Captain ("Capitanio") based in Perasto (see Table 2.1, also).

The other person injured by the ruin of the church, the Abbot, is none other than Andrea Zmaievich, who has already been introduced as an eyewitness and observer, and his poetic epistle has been presented (see Chap. 2 and Fig. 2.6). Differently from other poems on the 1667 earthquake, such as the aforementioned poem by Nicolò Bona, focused on the nobility and misfortune of the town of Ragusa on the occasion of the earthquake, the following stanzas of Zmaievich's poem tell his very personal experience (Zmaievich 1667ca). The translation from Croatian into English, courtesy of Ina Cecić, proceeds from the text as edited by Milošević (1970):

> "Slavic Oak Forest, eastern Dalmatia, mercifully visited by Our Lord in the year 1667"
> […]
> V) Before I have finished my sacred duty, //I started to mourn in the Death sweat,
> because the grounds and the famous castles shook, //all the walls fell from the foundations.
>
> VI) They have fallen above me and buried me alive //those marble rocks, causing the bitter death
> to the natty youth of my pour company, //so in the bitterness I shout these dirges.
>
> VII)What have you done, what happened //to myself unfortunate
> since I was born //I haven't heard that the cold
> stone can press so hard //like it presses me.
>
> VIII) The wreath of God from the above //has lowered its anger on me
> and over my dear company //who were pressed by it.
> Although it has buried me //it gave me a real hope
>
> IX) that the part of its mercy //will be shown to me
> and in spite of my sins and evil //help me in my distress.
> Omnipotent good //will relieve me of discomposure.
> […]
> XV) There is no greater torment or pain //or cumber in the world like the deadly faint
> when I felt it, pressed by the burden //that I can't say a word to ask for help
> as my lips were glued together //and the tongue was glued with the sorrowful saliva.
> […]
> XVIII) Excavated alive, although very hurt, //my beloved brothers lent me a hand
> spilled the tears above me in distress //to wash my bloodied face,
> they took me away to heal me, //took me to stay with them in sorrow and trouble.
>
> XIX) They gave the drink to the thirsty and refreshed the tired, //their help to me was very valuable.
> I started to talk, although sighing //and praise the Lord […]

On his arrival in Cattaro, two weeks after the earthquake, Cornaro asked the engineers, the same Benaglio and Moretti who had performed the survey of Cattaro, to be updated on the situation in the other settlements pertaining to Venetian Albania. In his following dispatch he wrote that the damage in Perasto was much less than he had reported in his previous dispatches (Doc#33). This statement seems to have a political relevance, as the deliberation of the Venetian Senate (Doc#38), allocating emergency funds for the reconstruction of the damaged places, included Perasto. Cornaro was expressing his opinion on how to distribute such funds, that is to give priority to the restoration of Cattaro, rather than informing on the actual status of Perasto.

Fig. 3.13 Scoglieto della Madonna (*Right*) and Scoglieto di San Zorzi (*Left*) (photo by PA, 2011)

Scoglieto della Madonna (Gospa od Škrpjela)
The only observation of the earthquake's effects on this artificial islet (Fig. 3.13) is in the report by Giumeta, immediately after his description of the effects in Perasto and the Scoglieto di San Zorzi:

"È caduto parimente al Scoglieto della Madonna il Convento dei Frati" (Similarly on the Scoglieto della Madonna the monastery of the friars has fallen) (Doc#11).

There is a memento on the wall of the monastery, indicating a fissure running from top to bottom, to remind the passers-by: "Traces of the earthquakes of 6 April 1667 and 15 April 1979" (Fig. 3.14).

Contado (Countryside) and Contea di Zuppa (County of Župa)
There is no precise definition of the Cattaro countryside that is referred to as "Contado" in the documents. In contrast, Zuppa, and its hamlets, amounting to 25 in a report written some fifty years earlier (Bolizza 1614), scattered across the fertile plain located to the south-west of Cattaro, had a tradition of forming a tight-knit community.

However, the information supplied by the Provveditore Estraordinario in Cattaro Giacomo Loredan in his final report (ASVe 1669) clearly indicates that the Contado and the county of Zuppa were the source of the food supplies of the town of Cattaro:

	Men at arms	Old people	Boys	Girls and women	Big livestock	Small livestock	Horses
Cattaro	304	13	215	698	–	–	3
Contado	404	68	504	497	401	808	20
Zuppa	300		150	350	620	1500	40

About the earthquake's effects, Triffon Drago (Doc#13) and Caterino Cornaro (Doc#33) generically mentioned some damage suffered by the "Contado".

The community of Zuppa, as they call themselves, addressed an official plea to the Venetian Senate and to the Provveditore Generale Caterino Cornaro in early

Fig. 3.14 Scoglieto della Madonna, wall of the monastery: a fissure running from *top* to *bottom* is highlighted by a sign, which says "Traces of the earthquakes of 6 April 1667 and 15 April 1979" (*photo* by PA, 2011)

May 1667 (Docs#88 and 89). As devoted subjects of the Republic of Venice, the community emphasised the punctuality with which they paid their taxes, and the concrete support that they had provided in repairing the fortifications in Cattaro and Budua damaged by the earthquake.

Budua (Budva, Stari Grad)

The old town of Budua was built on a small island just off the coast, at the north-western tip of a large, sandy riviera. Connected with the mainland since the 15th century, and part of the Venetian Albania province of the Republic of Venice since 1420, Budua was characterised by an imposing citadel, designed by Venetian engineers. This is how von Degenfeld (1670 ca) depicted it (Fig. 3.15) about four years before the earthquake (see Chap. 1), and how one of its bastions looks today (Fig. 3.16).

Resorting once more to the report by Giacomo Loredan (ASVe 1669), it is possible to learn that the town of Budua had then 802 inhabitants:

	Men at arms	Old people	Boys	Girls and women	Big livestock	Small livestock	Horses
Budua	272	6	132	392	84	36	10

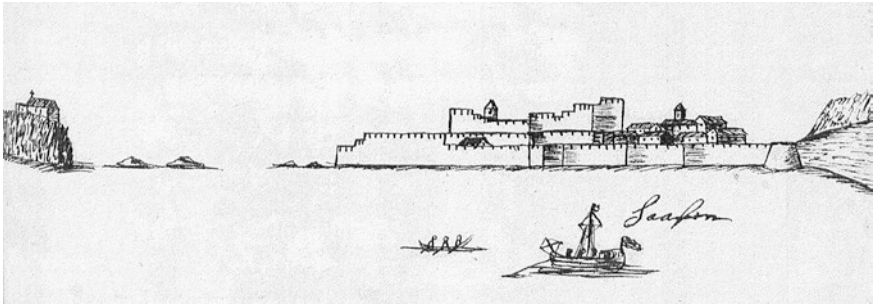

Fig. 3.15 Budua in 1663 (Degenfeld 1670 *ca)*

The news of the damage in Budua was contained in some documents written soon after the earthquake:

- Giacomo Loredan compared the effects in Budua to those in Cattaro in his two 7 April letters (Doc#2 and Doc#3)
- The archbishop of Ragusa, Pedro de Torres, listed Budua among the damaged settlements in his 9 April letter (Doc#4)
- Triffon Drago left Cattaro 2 h after the earthquake (see Chap. 2) and honestly reported he had no information about Budua (Doc#11) until he had arrived at Zara, and had talked with the other envoy from Cattaro, Vicenzo Giumeta; the

Fig. 3.16 One bastion of the Venetian fortress of Budua, marked by the winged Lion of Saint Mark, *symbol* of the Republic of Venice (*photo* by PA, 2010)

latter also received the information from an envoy from Budua, who reported that the earthquake had caused damage throughout the town, but without any further details (Doc#13)

When the news of the earthquake spread across Europe (see Sect. 2.2), the name of Budua was included in the list of the damaged places (e.g. Doc#47). This item was then repeated in several printed leaflets. They are too numerous to be listed here, but they are all referenced in Table 1.2.

Due to its strategic relevance and the need to maintain the fortifications in order, Budua was under the attentive scrutiny of the Provveditore Generale in Dalmatia et Albania. In his 21 April dispatch (Doc#33), Caterino Cornaro apprised the Senate that he had commanded the engineers to survey Budua. Dissatisfied by the report, Cornaro decided to ascertain by himself how reliable was the report of the heavy damage suffered by the town and the defensive structures. Cornaro resolved to visit the place himself, "though much suffering in its body and mind", in the company of the expert in fortifications Marchese degli Oddi and the engineer Moretti. The dispatch Cornaro wrote on 2 May was completely devoted to this topic, and it represents the most complete description of the earthquake's effects in Budua.

"Here I am reporting to Your Excellences, that in the walls five are the breaks, opened by the earthquake, three in the north-eastern side and two in the southern one, […] and also other sectors of the walls have suffered. The inferior part of the Castle was not significantly damaged, but the superior part looking toward the sea has the walls breached, inclined on one side the external part, and with a fissure which is larger in the direction of the town. The tower where the bell is has collapsed for the major part, as well as the house of the Podestà [*mayor*], and only five of the biggest buildings are still standing, but all the buildings are damaged, together with eight small houses, and the Church of Saint Francis, with its monastery; 73 people died, though out of them only three were men at arms, and eighteen soldiers." (Doc#77).

Eighteen months later, Budua was a port of call of the Venetian ambassador Alvise Molin on his way to Constantinople (Molin 1668). Arrived in the evening of 6 September 1668, he went ashore with his brigade the morning after to visit Budua, which he found "for the most part ruined by the earthquake, a sight that makes the visitors take pity on". The Holy Mass was celebrated in the half ruined cathedral.

As part of the diocesis of Antivari, the curacy of Budua was chosen as his residence by the new bishop, appointed on 23 February 1671, a person who has been able to steadily gain visibility on the stage of this event, Andrea Zmaievich (see Chap. 2 and the section on Perasto). The starting place of his first pastoral visit was Budua, to which Zmaievich made return on 3 November 1671, when he finally focused his attention on the churches of Budua, and their state of disrepair. The church of Saint John the Baptist, the Cathedral, "since the time of the earthquake is open, and the Holy Mass can be celebrated in the only chapel that has been restored." Zmaievich did not supply any detail on damage to the church of the Madonna, while of the annexed Franciscan monastery said "it was destroyed". The one hundred ducats Zmaievich received by the Sacred Congregation for the

Propagation of Faith "were spent in mortar and other materials, in order to fix the vicarage, which was open and for the most part destroyed, and this building at present is my home" (Zmaievich 1671).

Pastrovicchi (Paštrovići) and Castel di Lastua (Petrovac na Moru)
According to Zmaievich (1671), the population of the Pastrovicchi inhabited the coastal area between Budua and Spizza (Sutomore, Montenegro), a settlement then signalling the border between the Venetian Albania and the Ottoman Empire. The fortress of Castel di Lastua was the southernmost Venetian stronghold, and should not be confused with the settlement of Lastua (or Sucovizza), situated further inland, belonging to the Ottoman Empire.

In his report, Loredan (ASVe 1669) clearly merged and rounded the figures on the inhabitants of Pastrovicchi, distinguishing only those residing in Castel di Lastua:

	Men at arms	Old people	Boys	Girls and women	Big livestock	Small livestock	Horses
Pastrovicchi	250	3	250	200	–	–	–
Lastua	28	1	6	18	–	–	–

This area is mentioned as having been affected by the earthquake under the collective name of Pastrovicchi by the leaflet "Breve Ragguaglio" published on 27 April in Ancona (Doc#47).

The only record on Castel di Lastua was found in the 2 May dispatch by Caterino Cornaro: "Anco à quelli di Pastrovich nel Castel detto Lasena, vi è caduta la Torre, e procuro dar à medesimi il modo di ristaurarla" (Also in the Pastrovich area, in the place named Castel Lasena [*another spelling for Lastua*] the tower collapsed, and I will manage to give them the means to repair it) (Doc#77).

3.2.2.3 Inside the Ottoman Empire

In entering the territory controlled by the Ottoman Empire (Fig. 3.17), the vision tends to become blurred, making the process of defining the earthquake scenario more challenging. One evident reason of this difficulty is that this research could not take into account the documentation produced by the Ottoman officers. Another, not less important, reason is that both geographically and politically what happened in the inland territory then comprised in the Sanjak of Scutari was of very scarce interest for the central administration in Constantinople. Most of their efforts were concentrated on the Cretan War (War of Candia) with Venice, a long-lasting conflict (1645–1669) that was in its final moments in the year 1667.

However, to balance the shortage of locally produced documentation on the population of this area, we resorted to an outstanding report by a Mariano Bolizza from Cattaro, who surveyed the Sanjak of Scutari in the year 1614. Bolizza's report is a masterpiece of precision, as it covers in minute detail the geographical setting, the settlements with their place-names, the number of inhabitants, and the names of the responsibles of each village.

Fig. 3.17 Settlements under the rule of the Ottoman Empire and the Republic of Venice in the area of today Montenegro and Albania

With the only exception of Castel Novo, due to its location opening out onto the Bocche di Cattaro, at the triple-junction border with the Republic of Ragusa and the Republic of Venice, and its inclusion in some scanty descriptions of Venetian observers, the records supplying information on the earthquake's effects on the settlements to the south of Castel di Lastua have been extracted from the pastoral visit to the diocesis of Antivari, made by Andrea Zmaievich (1671).

Castel Novo (Herceg Novi)

According to Bolizza (1614), Castel Novo was too weak a stronghold to serve in properly defending the northen side of the entrance to the Bocche di Cattaro (Fig. 3.18): "The walled town is inhabited by Turkish only, while there are some Christians of the Roman rite living in the outskirts; in case, it can deploy 400 men at arms". One can use this figure for the population of Castel Novo in the year 1667, as the oscillations in the population were minimal in that area in the first part of the 17th century. Also, 400 men at arms can be considered a plausible figure in comparison with that of 304 men at arms established for Cattaro in 1669, in the report by Loredan (ASVe 1669).

The information about Castel Novo having been seriously affected by the earthquake is repeated in several accounts, with some variants that are worth mentioning.

On 7 April, in his letters Loredan (Docs#2 and #3) associated Castel Novo with the disaster suffered by Cattaro. The archbishop of Ragusa Pedro de Torres (Doc#4) in his 9 April letter did the same. Echoes of the damage at Castel Novo

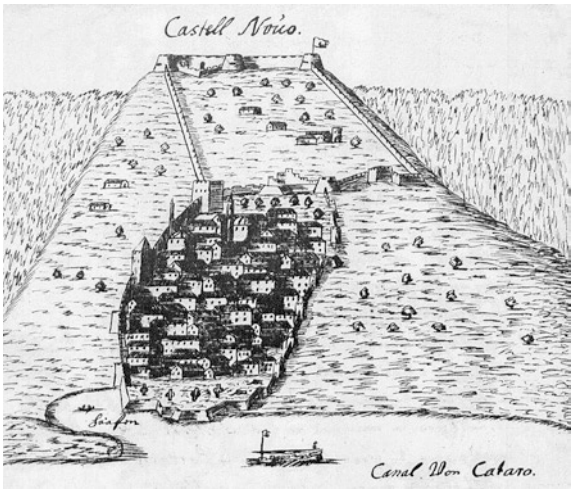

Fig. 3.18 Castel Novo in 1663 (Degenfeld 1670*ca)*

reached southern Italy rather quickly (see also Sect. 2.2), as testified by Veselicich (Doc#26).

On the same day of the earthquake, Triffon Drago is the first to observe Castel Novo "with a hand-held telescope" while sailing out of the Bocche di Cattaro: "I believe, that no more than twelve buildings have stayed untouched, a piece of the northern walls has collapsed, but it does not seem that the upper Castle has suffered. Since the adverse winds did not allow me to leave the Bocche, the morning after I could see that many tents had been pitched, under which I presume that the Turkish inhabitants had found shelter" (Doc#13).

The day after, the observation made by Triffon Drago was confirmed by Vicenzo Giumeta, with a slight variation, probably as he had not directly observed Castel Novo: "they say that no more than five or six houses are still standing" (Doc#11).

The letter sent on 9 April (Doc#5) by the Ottoman officers to the Rettore e Consiglieri of the Republic of Ragusa confirmed the damage at Castel Novo in a roundabout way, saying "our Lord gave us punishment", and immediately thereafter asking about the situation in Ragusa, and offering to help.

From 20 April onwards, starts a series of letters by Venetian informers living in Castel Novo, sent to addressees in Perasto and Cattaro. The earliest extant letter, dated 20 April (Doc#27) refers to a previous one by the same informer, dated 16 April, in which he briefed in great detail on the ruins caused by the earthquake in Castel Novo. This letter is lost, and is not summarised in any later item.

The flow of informers' letters suspiciously increases in the week soon after the appearance of Caterino Cornaro on the scene of the Bocche di Cattaro, on 21 April. The informers supply information on the movements of Ottoman soldiers in the area of Cattaro and Ragusa, remind the Venetian high-ranking officers of their past good services, the reward for which will compensate the loss of their homes that the informers had suffered on the occasion of the earthquake (Docs#53, #60, #64).

All the records converge on the description of widespread damage to the buildings inside the walled town, confirmed by the the need to hire labourers "to remove the ruins from the town" (Doc#60). Slight damage to the upper castle and fortifications is confirmed also (Doc#33).

Apart from supplying information on the earthquake's effects at Castel Novo, the documents by the informers provide evidence of the intelligence work going on in the area, of which Ragusa had a great share, too (Preto 1994).

One year later, Molin (1668) mentioned a small church that was still in disrepair. Two years later, Loredan (ASVe 1669) reported that the fortifications had still to be repaired.

There is no information about deaths nor injuries in Castel Novo. However, there is a letter written by the Ottoman chieftains of Castel Novo and dated 6 April 1667, received in translation on 17 April by Giacomo Loredan, Provveditore Estraordinario in Cattaro (Doc#1). It is a moving letter, thanking Loredan for "the acts of kindness to our brother Hussain Agà Sabanovich, in life, and also after his death, and because you deigned to give him back to us dead". The authors of the letter reminded Loredan of the "common curse", the earthquake, and wished him to live in peace, notwithstanding the ongoing conflict between the Sublime Porte and the Serenissima Republic of Venice. Its content is fully unveiled by Loredan, who in his 8 May letter wrote (Doc#90):

"Coll'occasione dell'accennato terremoto sendo restato socombente a gravi percosse il Schiavo Turco da che qui in custodia essisteva nel mio Palazzo, non gli lasciai mancare de governi, et assistenze migliori, mà il male, doppo alquanti giorni resosi incurabile, terminò la vita. Il suo Padre e congionti da Castel Novo udita la sua morte, mi ricercorono con efficaci, e premurose instanze di donargli il cadavere, che l'havrebbero ricevuto tanto quanto se fosse in vita; così anco stimai di fare, e con lettere molto cortesi del capitano, et altri Capi di Castel Novo mi significorono il gradimento, et ubligazione particolare, che n'havevano riportato […]" (On the occasion of the aforementioned earthquake, having been the victim of great injuries the Turkish slave who was here in custody in my Palace, I did not omit to make him have the best care, and attentions, but the injury became incurable, and he died. His father and relatives from Castel Novo heard of his death, and they were asking me with insistent and thoughtful requests to give them the body back, that they were going to welcome him as if he were still alive; and so I did, and with very courteous letter the captain, and other chieftains of Castel Novo they acknowledged my action, and how much they were obliged to me, and pleased).

Lastua (Žukovica)

In his pastoral visit, Zmaievich (1671) accounted for the damage suffered by two churches: the church dedicated to San Vito was destroyed by the earthquake, with one chapel only left standing, where the celebrations can be hold; the church consacrated to S. Tomaso, which has suffered light damage only.

Subzi (Zubci)

In the place of Subzi, Zmaieivch (1671) could count 45 houses and about 130 souls. The parish church is dedicated to S. Nicolò, while another one, consecrated to S. Giovanni Battista was in ruin because of the earthquake.

Tugemille (Tuđemili)
According to Bolizza (1614), the village of Tugemille, spelt "Togliemeddi", had 30 houses and 60 men at arms.

When Zmaievich (1671) visited the place, he found the church dedicated to S. Nicolò "opened and tumbledown because of the earthquake, one chapel only remains, where it is possible to celebrate Mass".

Ptelicchi (Gornja Briska)
This place is not mentioned by Bolizza (1614). It was located and identified by following, place by place, the route taken by the local assistant of Zmaievich (1671) during his pastoral visit. The assistant reported that the two churches of Ptelicchi, one dedicated to "Sant'Alessandro" and the other to S. Nicolò, were left in ruins by the earthquake.

In closing, the contribution of Zmaievich as one of the observers of this earthquake and considering Fig. 2.6, which shows all the places he mentioned in his pastoral visit, it is remarkable that he contributed with observations on fifteen places not mentioned in any other contemporary source.

Unfortunately, for twelve out of those fifteen places he did not record any kind of earthquake effect. They are: Sussan (Šušanj), Santa Maria di Rotaz (Santa Maria di Ratac), Spizza (Sutomore), Sosina (Sozina), Marcovicchi (Mercòvici), Briska (Donja Briska), Livari (Livari), Pincichi (Pinčići), Sestani (Šestan), Monasterio di Prasquiza (monastery near Čelobrdo), Pobori (Pobori), Mahini (Maini).

Antivari (Bar)
Bolizza (1614) called Antivari "la bella città" (the beautiful town), located in a fertile and pleasant plain, made of about 400 houses. In the suburbs there are another one hundred houses, and in all about 500 men at arms.

In all the documents written soon after the earthquake, the description of damage in Antivari is dismissed with some standard and recurring wording, of the kind "the town is in ruin". This kind of superficial information is supplied by the archbishop Pedro de Torres (Doc#4), who most probably heard the news while stuck in the harbour of Santa Croce (see Sect. 2.1), the Venetian envoy Triffon Drago (Doc#13), Caterino Cornaro (Doc#33), and some leaflets, already mentioned, and all taking their information from the "Breve Ragguaglio", published in Ancona (Doc#47).

Antivari is among the places visited by the bishop Andrea Zmaievich (1671), who was the only one to mention that some buildings had suffered damage:

- The Cathedral dedicated to S. Giorgio has three naves, with vaults sustained by ten beautiful columns, now used as a mosque; on its side there is a quadrangular bell tower, with large marble windows decorated by small pillars, and its upper part half collapsed
- To the right side of the bell tower one can see the bishop palace, similarly destroyed.
- Out of the 53 churches and chapels in the walled town and the suburbs some are uncovered
- In the countryside to the east there are gardens and orchards, and some nice houses, some of which are uncovered.

Dolcino (Ulcinj)
Located on the coast of the Adriatic, Dolcino was appreciated by Bolizza as much as Antivari, for its location and for the many olive trees in its territory. There are about 300 houses, and 800 men at arms.

The documents including Dolcino in their list of damaged places are the same as for Antivari, with the exception of Zmaievich, who did not visit this place.

The only document reserving a few words to this specific place is by Caterino Cornaro (Doc#33).

Admitting that his source of information is undefined, Cornaro composed a sentence that comprised the earthquake's effects in Antivari, Dolcino and Scutari, creating a light, but undeniable anticlimax, from severe to light damage:

"Antivari vien detto che sia in conquasso; Dulcigno con del mal molto; e Scutari ha patito anch'esso benche non tanto" (Antivari is said to have been shattered and broken into pieces; Dulcigno has suffered much damage; and Scutari has suffered too, though not too much).

Scutari (Shkodër)
According to Bolizza (1614) the fortress of Scutari, located on the banks of the lake of the same name, together with its suburbs had about 400 houses, and could deploy 1,000 men at arms.

Scutari was first mentioned in the 21 April dispatch by Caterino Cornaro, as follows: "Scutari ha patito anch'esso benche non tanto" (Scutari has suffered too, though not too much) (Doc#33).

The "igumno" (igumen or abbot in the Eastern Orthodox Church) of Scutari wrote to a Nicolò Bolizza in Cattaro, to inform him about the intentions of the Ottomans to move against the Venetians in Cattaro, taking advantage of the breaches opened in the walls by the earthquakes (Doc#54). He gave no information on the effects of the earthquake in Scutari, but held that the news of 300 deaths in Cattaro were nothing but big lies, rumours spread in an underhand manner.

3.3 In Seismological Terms

In conclusion, all the information on the earthquake's effects that has been presented and analysed in the preceding pages provides a large data set. This data set has been processed further in order to assign intensities to each location according to the macroseismic scale EMS98 (Grünthal 1998; Musson and Cecić 2002).

This process ensures that the new documented evidence collected during this study is combined with the specific approach adopted in handling these records. The fact that they were written in a distant time and frame of reference, and from varied perspectives and motives, has been considered throughout in order to fully appreciate their seismological contents.

In assigning the macroseismic intensity, the inherent uncertainty of the historical records on this earthquake, especially the epistemic uncertainty deriving from the availability of only a poor set of the diagnostics included in the EMS98, was expressed by means of a range of values (e.g. 7–8).

A macroseismic intensity was assigned to each of the 37 observation points, namely those settlements for which the records were considered to be reliable.

The maximum intensity assigned was 9 EMS98, at three places: Ragusa, Ombla, and Santa Croce.

The observation points are listed in Table 3.4 by the place-names quoted in the sources and adopted throughout this book. Also included is their modern place-name, the country they belonged to in 1667, and the one of today, the coupled geographical co-ordinates by which they have been identified, and finally the assigned intensity, in EMS98. The same places are mapped in Fig. 3.19, with the set of symbols for intensity degrees adopted in the macroseismic database for the Euro-Mediterranean area "Archive of Historical Earthquake Data-AHEAD" (Locati et al. 2014).

However, it should be noted that, for seventeen places indeed mentioned by one or more of the 114 items listed in Table 1.2, there is no additional information on the 1667 earthquake and its aftereffects, and no reliable macroseismic intensities could be assigned.

The seventeen places that were not evaluated are:

1. Sabbioncello (Orebić), and Cobasc (Kobaš), inside the territory of the Republic of Ragusa (see Fig. 3.2)
2. Rose (Rose) in the Bocche di Cattaro (Fig. 3.8), Cuzzi (Kuci), in today Montenegro (Fig. 3.17), and Mostar (Mostar), to the north-east of the town of Ragusa, currently Bosnia and Herzegovina, that were all under Ottoman rule at the time
3. twelve places that were visited by Andrea Zmaievich and his assistant in his pastoral visit, all shown in Fig. 2.6, and namely Sussan (Šušanj), Santa Maria di Rotaz (Sveta Marija Ratačka), Spizza (Sutomore), Sosina (Sozina), Marcovicchi (Markovići), Briska (Donja Briska), Livari (Livari), Pincichi (Pinčići), Sestani (Šestan), Monasterio di Prasquiza (monastery near Čelobrdo), Pobori (Pobori), and Mahini (Maini).

A strict and uncompromising approach was adopted for as much of the affected area as possible, and all reliable sources, which could be collected, were consulted and considered.

The re-interpretation of the original sources performed within the framework and methodology of this study has made it possible to conclude that there are sound reasons to dispute the authenticity of some of the records considered to be trustworthy in some previous studies.

One paradigm shifting conclusion concerns the reports that the earthquake had been felt in Venice, located some hundreds of kilometres to the north of the most affected area. The origin of the record is Travagini (1669), and his is the sole record on Venice.

Travagini was included among the sources on the 1667 earthquake's effects by Kišpatić (1891; see details of his study in Sect. 1.2). Kišpatić also accepted the word of Travagini that the earthquake had also been felt in Naples also, although

Table 3.4 Macroseismic intensities in EMS98 for the 6 April 1667 earthquake

Place name as quoted by the sources	Modern place name	Country in 1667	Country	Lat	Lon	Int EMS98
Ragusa	Dubrovnik	Republic of Ragusa	Croatia	42,641	18,111	9
Ombla	Rijeka Dubrovačka, Mokošica and Rožat	Republic of Ragusa	Croatia	42,676	18,095	9
Santa Croce (di Gravosa)	Gruž	Republic of Ragusa	Croatia	42,659	18,087	9
Calamotta	Koločep, island and place	Republic of Ragusa	Croatia	42,679	18,007	8–9
Isola di Mezzo	Lopud, island and place	Republic of Ragusa	Croatia	42,691	17,943	8–9
Scoglieto della Madonna	Gospa od Škrpjela	Republic of Ragusa	Montenegro	42,486	18,691	8
Canali	Čilipi	Republic of Ragusa	Croatia	42,549	18,287	8
Breno	Srebreno	Republic of Ragusa	Croatia	42,623	18,196	8
Osonik	Osojnik	Republic of Ragusa	Croatia	42,710	18,072	8
Orasciaz	Orašac	Republic of Ragusa	Croatia	42,702	18,007	8
Tarsteno	Trsteno	Republic of Ragusa	Croatia	42,714	17,979	8
Barsecine	Brsečine	Republic of Ragusa	Croatia	42,731	17,960	8
Saton	Zaton	Republic of Ragusa	Croatia	42,690	18,038	8
Scoglieto di San Zorzi	Sveti Đorđe	Republic of Venice	Montenegro	42,487	18,689	8
Ragusa Vecchia	Cavtat	Republic of Ragusa	Croatia	42,581	18,218	8
Stagno Grande	Ston or Veliki Ston	Republic of Ragusa	Croatia	42,839	17,696	8
Perasto	Perast	Republic of Venice	Montenegro	42,487	18,699	8
Budua	Budva, Stari Grad	Republic of Venice	Montenegro	42,278	18,838	8
Castel Novo	Herceg Novi	Ottoman Empire	Montenegro	42,453	18,538	8
Cattaro	Kotor	Republic of Venice	Montenegro	42,426	18,772	8
S. Giacomo di Visegnizza	Sveti Jakov u Višnjici	Republic of Ragusa	Croatia	42,636	18,132	7–8

(continued)

Table 3.4 (continued)

Place name as quoted by the sources	Modern place name	Country in 1667	Country	Lat	Lon	Int EMS98
Zuppa, Contea di	Župa	Republic of Venice	Croatia	42,360	18,760	7–8
Giuppana	Sudurađ, Island of Šipan	Republic of Ragusa	Croatia	42,711	17,909	7–8
Primorie	Podgora, Dubrovačko primorje	Republic of Ragusa	Croatia	42,838	17,843	7–8
Meleda	Babino Polje, Island of Mljet	Republic of Ragusa	Croatia	42,735	17,553	7–8
Stagno Piccolo	Mali Ston	Republic of Ragusa	Croatia	42,846	17,705	7–8
Ponta	Prapratno	Republic of Ragusa	Croatia	42,821	17,676	7–8
Pridvorje	Pridvorje	Republic of Ragusa	Croatia	42,551	18,350	7–8
Slano	Slano	Republic of Ragusa	Croatia	42,787	17,890	7–8
Antivari	Bar	Ottoman Empire	Montenegro	42,093	19,135	7
Castel di Lastua	Petrovac na moru	Republic of Venice	Montenegro	42,206	18,940	7
Subzi	Zubci	Ottoman Empire	Montenegro	42,128	19,116	6–7
Tugemille	Tuđemili	Ottoman Empire	Montenegro	42,134	19,146	6–7
Ptelicchi	Gornja Briska	Ottoman Empire	Montenegro	42,116	19,228	6–7
Lastua	Žukovica	Ottoman Empire	Montenegro	42,227	18,956	6–7
Dolcino	Ulcinj	Ottoman Empire	Montenegro	41,927	19,203	6–7
Scutari	Shkodër	Ottoman Empire	Albania	42,068	19,513	6

no source is mentioned to support this information. Perhaps Kišpatić trusted his predecessor scientist because Travagini maintained to have felt the earthquake himself, and, possibly, because he shared and supported Travagini's theory on the causes of earthquakes.

Lastly, Kišpatić states that Istanbul and Izmir (Turkey) were among the places where the earthquake was felt. However, there is no mention of any contemporary source used by Kišpatić.

No "felt reports" were found in the thorough and comprehensive set of documents collected and consulted in this research.

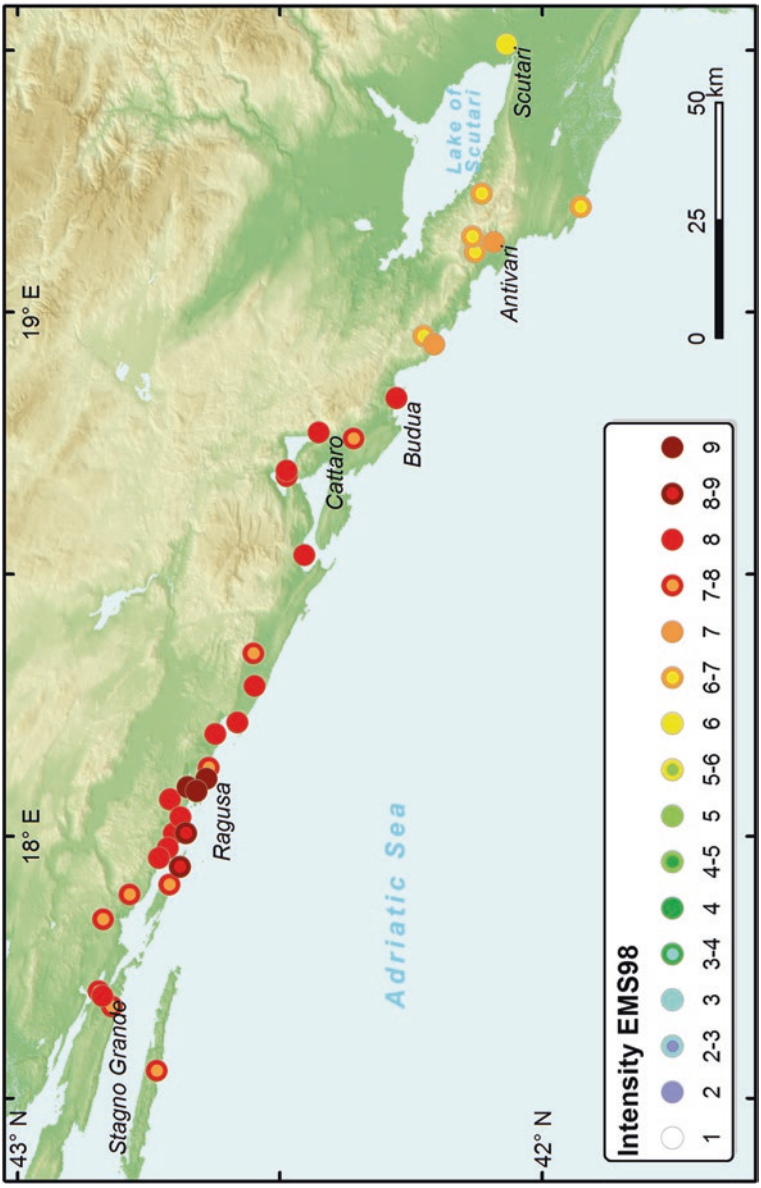

Fig. 3.19 Macroseismic intensities in EMS98 for the 6 April 1667 earthquake

3.4 Epilogue

The earthquake of 1667 and its aftermath have been described through the words and the perspectives of the people who experienced and observed the phenomenon.

The set of sources on which this proposed reconstruction and reinterpretation is based upon resulted from an extensive "research without borders". No pre-defined limits were established in terms of:

- the area to be investigated, even if it meant that one should consider the present administrative jurisdictions of the affected places, which are currently scattered in three different countries;
- the actual location of the consistent number of documents retrieved, albeit that they are stored in several different archives and libraries in just as many different countries;
- the various languages in which the documents were written;
- the types of accounts, which stem from very many diverse perspectives.

Such a variety asked for a careful introduction of the reader to the different cultural contexts from where the observations came in order to discover the nuances of each record, no matter its author or their status. This also meant that the central part of this book is devoted to placing these real people who made the observations, and especially those who actually experienced the earthquake themselves, in context.

As mentioned previously, in order to extract the "seismological juice" from all the sources collected was indeed painstaking and meticulous work, especially in the case of the town of Ragusa. However, the results are encouragingly, especially from a historical seismological perspective. By going back to the original sources, this study has succeeded in correcting many previous misunderstandings in the interpretation of the historical documents, many of which created mostly by the language and cultural barriers, and other filters, posed at every step by this fascinating observations, which are contained in an unusually abundant, international and "multi-colored" documentation surviving to us.

In addition, this study proposes that the earthquake of 6 April 1667 no longer be referred to as "the Great Ragusa earthquake". The number of macroseismic intensities in the most severely affected areas have more than doubled, and their distribution in space was extended in a significant way, both in the northern and southern direction, providing the seismologists with a much more detailed and comprehensive view of the actual events of that fateful day.

Although many aspects and details of life in the affected areas in the seventeenth century have been left out, those who are interested can have a look at the full texts of many of them, in their original language, in the Electronic Supplementary Material (http://extras.springer.com).

For the author, it is time to proceed to other commitments, and of course continue researching other earthquakes of the past.

Now that the circle has been closed, and the threads spun at the beginning of this book have been woven into a story—the story of the Great 6 April 1667 Dalmatia Earthquake.

References

17th century sources

ASVe, 1669. "Relazione" (report) by Giacomo Loredan, Provveditore Estraordinario a Cattaro. Collegio, V (Secreta), Relazioni, b. 65, ff. 1r-6v + enclosures.

Bolizza Mariano, 1614. Relatione et descrittione del sangiacato di Scuttari, dove si ha piena contezza delle città et siti, loro villaggi, case et habitatori, rito, costumi, havere et armi di quei popoli, et quanto di considerabile minutamente si contenga in quel ducato; fatta da Mariano Bolizza nobile di Cattaro. Ljubić S. (ed.), Starine, vol. XII, Jugoslavenska Akademija Znanosti i Umjetnosti, Zagreb, 164–205.

DADu, 1668a. Letter by Count Zamagnio, Acta Sancta Mariae Maioris, 17, 74, 2129/24, 1 f.

DADu, 1668b. Letter by Count Zamagnio, Acta Sancta Mariae Maioris, 17, 74, 2129/136, 1 f.

DADu, 1668c. Letter by chancellor Gioelich, Acta Sancta Mariae Maioris, 17, 74, 2129/136, 2 ff.

Degenfeld von Ch., 1670 *ca.* Beschreibung der Reise so ich Christoff Freyherr von Degenfeldt im Jahr Christi 1661 von Dürnau aus angefangen, und im Jahr 1670 vollendet habe, aus was auf solchen Vorgängen, undt sonstens Marckwürdiges zu sehen gehabt. *Manuscript*, Kraichgau 3, Badische Landesbibliothek, Karlsruhe, xix + 932 folios

Molin A., 1668. Diario della speditione dell'Ill.mo et Ecc.mo Signor Alvise da Molin Cavagliere alla Corte del Gran Signor. ASVe, Miscellanea di atti diversi manoscritti, f. 54.

Theatrum Europaeum, 1677. Vol. X, Continuatio, for the years 1665–1671, Franckfurt am Mayn, 1751 pp.

Travagini F., 1669. Francisci Travagini super observationibus a se factis tempore ultimorum terraemotuum, ac potissimum Ragusiani, physica disquisitio, seu gyri terrae diurni indicium. Lugduni Batavorum.

Zmaievich A., 1667ca. "Slovinska Dubrava, istočna Dalmacija, milostivo od Gospodina Boga pohođena godišta 1667", Excerpts from stanzas V–XIX, translated into English by Ina Cecic, following the edition of the manuscript in Milošević M., 1970. Pjesnička poslanica Andrije Zmajevića postradalom Dubrovniku 1667. godine. Anali Historijskog instituta JAZU u Dubrovniku, 12, 297–330.

Zmaievich A., 1671. Relazione dell'arcivescovo della diocesi di Antivari e del Vicariato di Budua, di Andrea Zmaievich della Sacra Congregazione per la diffusione della Fede. In: Gelcich G., 1883. Biblioteca Storica della Dalmazia, vol. 8, Documenti, n.37, 105–120.

Modern studies

Albini P., 2004. A survey of the past earthquakes in the Eastern Adriatic (14th to early 19th century). Ann. Geophys., 47, 2/3, 675–703, doi:10.4401/ag-3331

Albini, P., Rovida A., Locati M., 2009. Earthquake history of the Republic of Ragusa (today Dubrovnik, Croatia). AGU Fall Meeting, Session S03: New Views of Ancient Earthquakes (S03). 5–9 December 2005, San Francisco, CA, USA (Invited).

Anicic D. et al. (contributors), Matthiesen R.B. (coordinator), Leeds Arline (editor), 1980. Reconnaissance Report Montenegro, Yugoslavia earthquake, April 15, 1979. Berkeley, Calif. : Earthquake Engineering Research Institute, National Science Foundation (U.S.), 69 pp.

Carter F.W., 1972. Dubrovnik (Ragusa), A Classic City-state. Seminar Press, London and New York, 710 pp.

Cusmich G., 1864. Cenni storici sui Minori osservanti di Ragusa. Trieste, Tipografia del Lloyd Austriaco, 79 pp.

Di Vittorio A., 1983. Finanze e moneta a Ragusa nell'età della crisi. Giannini Editore, Napoli, 284 pp.
Dolci S., 1746. Monumenta historica Provinciae Ragusinae. Neapoli, 83 pp.
Dominici P. e Marcelli L., 1979. Evoluzione storica delle misure orarie in Italia. Annali di Geofisica, XXXII, 1, 131–212.
Ferrari G. e Marmo C., 1985. Il "quando" del terremoto. Quaderni Storici, N.S., 60, anno XX, fasc. 3, 691–715.
Foretić V., 1980. Povijest Dubrovnika do 1808. 2 vols., Matica hrvatska, Zagreb.
Giessberger H., 1913. Das Ragusanische Erdbeben von 1667. Münchener Geographische Studien, München, vol. 28, 74 pp.
Grujić N. and Fabianić D, 2003 Dubrovački ljetnikovac (The villa of Dubrovnik). FAB d.o.o., Zagreb, 112 pp.
Grünthal G. (ed.), 1998. European Macroseismic Scale 1998 (EMS-98). Cahiers du Centre Européen de Géodynamique et de Séismologie 15, Centre Européen de Géodynamique et de Séismologie, Luxembourg, 99 pp.
Harris R., 2003. Dubrovnik. A history. Saqi, London, 503 pp.
Horvat-Levaj K. and Seferović R., 2006. Baroque reconstruction of the Rector's Palace in Dubrovnik. Dubrovnik Annals, 10, 87–122.
Kowalczyk G., 1909. Denkmäler der Kunst in Dalmatien, Tafel 128b. Verlag für Kunstwissenschaft, Berlin, 29 pp. and 132 loose plates. Downloaded from http://commons.wikimedia.org/wiki/File:Tafel_115a_Ragusa-Dubrovnik_-_vor_dem_Erdbeben_1667_-_Heliografie_Kowalczyk_1909.jpg
Locati M., Rovida A., Albini P., Stucchi M., 2014. The AHEAD Portal: A Gateway to European Historical Earthquake Data. Seismological Research Letters, 85, 3 727–734, DOI 10.1785/0220130113
Mihajlović J., 1947. Seizmički karakter i trusne katastrofe našeg južnog Primorja od Stona do Ulcinja. Srpska akademija nauka i umetnosti, posebna izdanja, knj. CXL, Prirodnjački i matematički spisi, knj. 39, VI + 149 pp., 8 sl., 14 priloga, Beograd.
Miović V., 2005. The Jewish Ghetto in the Dubrovnik Republic (1546–1808). Dubrovnik, 149 pp.
Musson R.M.W., 1998. Intensity assignments from historical earthquake data: issues of certainty and quality. Annali di Geofisica, vol. 41, 1, 79–91.
Musson, R.M.W. and Cecić, I. 2002. Macroseismology. In: Lee, W.H.K.; Kanamori, H.; Jennings, P.C. and Kisslinger, C. (Eds.). International Handbook of Earthquake and Engineering Seismology. International Geophysics 81 (Part A, 49): 807–822.
Petter F., 1834. Compendio geografico della Dalmazia con un'appendice sul Montenero. Tipi dei Fratelli Battara, Zara, 252 pp.
Preto P., 1994. I servizi segreti di Venezia. Il Saggiatore, Milano, 638 pp.
Samardžić R., 1960. Борба Дубровника За Опстанак После Великог Земљотреса 1667 Г. Архивска Грађа, 1667–1670 (Raguse dans sa lutte pour l'existence après le grand tremblement de terre de 1667, documents d'archives, 1667–1670). Académie serbe des sciences. Recueil pour l'histoire, la langue et la littérature du peuple serbe, IIIe Classe, Beograd, 655 pp.
Stjepan Gradić otac domovine, 2013. Catalogue of the exhibition for the 400th anniversary of the birth of Stjepan Gradić, Knežev dvor, Dubrovnik, 442 pp.
Vedrana Gjukić-Bender, 1999–2000. Prikazi Dubrovnika u slikarstvu. In: Prilozi povijesti umjetnosti u Dalmacij, Split, p. 232.
Vekarić N., 1998. The population of the Dubrovnik Republic in the fifteenth, sixteenth, and seventeenth centuries. Dubrovnik Annals, 2, 7–28.
Viscovich F., 1898. Storia di Perasto (Raccolta di notizie e documenti) dalla caduta della Repubblica Veneta al ritorno degli Austriaci. Trieste, Tipografia del Lloyd Austriaco, 332 pp.
Žile I., 2008. Archeological findings within the historic nucleus of the city of Dubrovnik. Dubrovnik Annals, 12, 73–92.