

# Archaeologists and earthquakes: the case of 365 A.D.

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## Abstract

Archaeological evidence of an earthquake in the second half of the 7th century A.D. on Crete is described and the 365 A.D. «universal» earthquake problem is resumed. Some general problems regarding the study of seismic effects on archaeology in the Mediterranean area are presented. A few imbalances are indicated due to the lack of an effective collaboration between technical experts and historians.

**Key words** *archaeology – earthquakes – Crete – Libya*

Recent excavations demonstrate how, beyond reasonable doubt, archaeology may give not only certain evidence for a seismic event as well as date it, but may offer useful information on seismic damage evaluation. It is, however, rare for an archaeological datum to help in the construction of a seismic scale regarding historical data.

I shall discuss one earthquake that disrupted the urban fabric of Gortyna, ancient capital of Crete and Cyrene, with social and economic consequences easy to imagine (figs. 1 to 4). The event is dated shortly after 666 A.D. and only the Acropolis of the ancient urban centre survived, even though groups of inhabitants occupied the ruins of the low city once again. The destruction described in nearby Samos, where the famous Eupalinos' tunnel went out of use during the same years, was due almost certainly to the same earthquake (Hautumn, 1981).

Between 673 and 677, Crete was under Arab occupation and even though there was no connection between the two events – violent earthquake and arrival of the Arabs – such a connection becomes increasingly evident from

archaeological research and in Greece there are many examples which date from the Mycenaean to the invasion by the Slaves in the first decades of the 7th century.

Because of natural catastrophes, devastated areas and cities must have appeared in ancient times to the powerful invaders' eyes much more fragile than usual. And they were, indeed; it was no coincidence that Jericho was conquered by Joshua once the walls defending her had fallen and certainly not because of the clangour of trumpets.

While this earthquake post 666 as well as the one that upset the city around 618 are widely documented, as far as the famous earthquake of July 365 is concerned, it was only during the last excavation campaign that we found reliable documentation after having gone through 4-5 strata of the Byzantine city. Only in 1993 was it possible for us to mark out, under Heraclius' *praetorium*, the *praetorium* rebuilt from the foundations after complete destruction in 365, from the *praeses* Oikoumenios Asklepiodotos Dositheos in 383 (fig. 5).

The brilliant evidence of this cataclysm on Crete does not come to us from archaeology, but is offered by the recent studies of the sea level, which have shown a 9 m rise from the coastal line to the island's western end to be explained only by an extremely violent



tsunami. A rise that the sophisticated measurements carried out on samples of shells have determined the tsunami between 341 and 439 A.D., *une fourchette* that had led Pirazzoli *et al.* to identify this phenomenon with that of the «universal» earthquake of 365 (Pirazzoli *et al.*, 1992).

When I was giving information on the excavations under my direction between 1962 and 1965 in Tripolitania, I first put forward the hypothesis that Sabratha had been devastated not by the Austurians, as had been unanimously claimed up to then and as some still dare to repeat, but by a strong earthquake (Di Vita, 1964). At that time I had not read the reports by Ammianus, Libanius and even less those by

**Figs. 1-4.** Gortyn (Crete). Effects of the 666 A.D. earthquake.

**Figs. 1-2.** Gortyn (Crete). The Mitropolis episcopal Basilica: columns of the 1st and of the 5th collapsed naves (in direction from North to South), seen from the West.



**Fig. 3.** Gortyn (Crete). The North-South collapse of the columns on the front of the court in front of the temple of «The Augustan Gods», from the North (excavations of Italian School of Archaeology in Athens, 1989-91).



**Fig. 4.** Gortyn (Crete). Practorium, room 14 (*calidarium*). The collapse of the vault, and on this one, of the eastern wall; from the North (excavations of Italian School of Archaeology in Athens, 1989-91).



**Fig. 5.** Gortyn (Crete) *Praetorium*, rooms 45 and 47, the southward collapse of the US 406 wall because of the earthquake of 365 A.D. (excavations of Italian School of Archaeology in Athens, 1989-91).

St. Jerome which did not exist in the Library of the Tripoli Antiquities Department at that time.

That the Austrurians were a dangerous camel-riding tribe for the cities of the Tripolitanian coast had already been proved by their raid in 363 A.D. on the Lepcis fields, but that almost all of the imposing buildings in Lepcis and Sabratha had been methodically destroyed by marauders, even camel back-riding ones, was difficult to believe from examination of the old excavations as well as my own (Di Vita, 1990). An *aes 3* of the first years of the Valentinianus and Valens reigns (364-367) found in the stratigraphic essays in one of the destroyed buildings in the second half of the 4th century, made it clear to me that the event that had upset the city's life was to be dated after the middle of 364, while it is certain that during none of the three raids recalled by Ammianus between 363-364 and 367, did the Austrurians reach Sabratha, nor did they ever manage to force the walls of Lepcis and Oea.

The Lepcis and Sabratha archaeological data were very soon supplemented by both the information offered by the villas found in the Sixties along the coastal line near Sabratha and in particular between Oea and Lepcis, and the discoveries by Goodchild in distant Cyrene (Goodchild, 1966-67). Goodchild, my colleague in Libya responsible for the antiquities in Cyrenaica, was an expert excavator and had not overlooked the extensive destruction that the Pentapolis cities had suffered in the second half of the 4th century A.D., well documented mainly in Cyrene, thanks also to the excavations of the Italian mission under Stucchi and the American one operating at the Demetra sanctuary (White, 1984). Goodchild made an important discovery at Balagrae (now Beida) where in the theatre area of the Asclepieion, modest small houses had been installed which collapsed on the inhabitants. In the *peculium* of one of these, Goodchild identified an *aes 3* of the first Valentinianus and Valens issues, the

exact parallel of what I had found at Sabratha (Di Vita, 1990). It was because of the distant but concomitant destructions that Goodchild and I were led to Ammianus, Libanius and St. Jerome as well as the few other coeval sources of the 365 earthquake. This, among the numerous sources of the 4th century, is the most recalled not only because it immediately rose as a symbol of two opposed visions of late antiquity, but undoubtedly for its exceptional power, a power that appeared «monstrous» and «universal» to the civilised world all around the Mediterranean basin.

Following excavation data and a methodical inquiry into all the *rappports de fouilles* (Di Vita, 1990), I concluded that in 365 it was not only a limited tsumani in the Central Mediterranean, but a series of earthquakes of such intensity and so close in time that they were to be remembered as a unique event. A twin event, or almost, upset the Mediterranean basin in October 1856.

As Traina (1989) correctly noted in the only Italian volume focussed on seismic archaeology (Guidoboni, 1989), the discussion on the 365 earthquake is essentially a question of method; this discussion has been further developed in Guidoboni *et al.* (1994).

While field archeologists continue to accumulate data referring to that catastrophe – Senay being the last one, illustrating the circular monument of Carthage (Senay, 1989), philologists and historians continue to consider archaeological evidence negligible, when they do not *tout court* deny it, as Henry did (Henry, 1985) with regard to Libanius' evidence. In order to understand the ancient sources, it does not seem to me a good method to entrench oneself behind the opinions of the technical experts who, at the same time, wish to collect data from a correct interpretation of the historical memory.

At this point, mention should be made of the technical experts' position in the international field, *i.e.* that of geophysicists, paleographers, seismologists and structural engineers, regarding earthquakes in ancient times. The geometrical progression with which we have worked in the field of ancient seismology in the past thirty years is due to them. In the Sixties, Caloi introduced me to the studies of

Kárník, in order to make it possible for me to learn some serious things on the seismic history of the Mediterranean (Kárník, 1968-71).

The old Baratta catalogue (Baratta, 1901) was still in use to study the earthquakes of the Italian peninsula. Today, it is enough to take a look at the bibliography in Guidoboni's work (Guidoboni, 1989) and recall the international meetings and congresses that have taken place one after the other in recent years, constantly, or almost, organized by technical experts, to realize how scientists have overtaken archaeologists and historians in their interest in historical seismology. This is due naturally to the awareness that only with the data available referring to a period of many centuries, or better millenia, is it possible to make serious «paradigms» to be used in the future.

This necessity has urged the technical experts in the past 30 to 40 years to provide more numerous and more topographically limited or temporally restricted earthquake catalogues: from the basic catalogue on Palestine's earthquakes (Kallner-Amiran, 1950-51) which wrongly attributes 365 destructions like those of Petra (*cf.* Russell, 1980), to the most recent article devoted to Western Mediterranean seismology between 1690 and 1710 (Ambraseys and Finkel, 1992).

Unfortunately, what makes the consultation of these earthquake lists risky is the fact that quite often there has been no collaboration between technical experts and historians and therefore the quotations from the ancient sources have not been checked, while the dates are often wrong. Above all, a serious fault in these lists is that the same earthquake is referred under different dates, since the sources have not been considered critically. In the most recent collection of earthquake sources (Panesa, 1991), three earthquakes have been recorded in 46, 53 and 66 A.D. which, probably, are one and the same.

If archaeologists really want to keep up to date, they must constantly refer to the numerous technical publications that concern them. A collaboration between history, geography and the physical sciences is not only desirable, but necessary and should be an ongoing rather than sporadic process. After Guidoboni's work

(Guidoboni, 1989), a group of historians and technical experts agreed to create a nucleus that would promote this collaboration in Italy and an Institute-Laboratory for Mediterranean Seismic Archaeology (ILAS) was set up (A. Di Vita, E. Guidoboni, G. Magri, R. Parenti, A. Sinopoli). Our immediate goal was to awaken the archaeologists operating in the field to the problems we are now tackling; our final goal was to compile a data bank where these seismic effects in archaeology could be stored as they are not mentioned in any written source, but have been found in excavations. We also offered a free technical and archaeological collaboration. We sent some questionnaires to all the Archaeology Departments and University Institutes still excavating in Italy and then we waited. Ironically, we are still waiting! Only nine questionnaires were returned, five of which filled in by foreign colleagues responsible for excavations in Italy and Tunisia and four by university colleagues. No answer was received from any Archaeology Services (Sovrintendenze Archeologiche). Naturally, there may be many reasons for this, from the optimistic one that ancient Italy was not touched by the earthquakes, to the more realistic one that an earthquake cannot be evident in the small excavations that in general keep our Ancient Monuments Services busy. Another reason is that answering a scientific questionnaire requires some engagement. Nevertheless, I am afraid that it happens because a multidisciplinary research approach is not widespread enough. This is a pity because in a few years it would have been possible to give scholars of all related historical or scientific disciplines a significant data bank of archaeological evidence, which added to the data from written sources, would have been of great importance for studying both archaeology and seismology in Italy. I hope these collaborations will be developed and enhanced by exchanges and meetings like this one.

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