



THE IMPACT OF THE ERUPTION OF THERA IN THE CENTRAL PALACE SANCTUARY AT KNOSSOS, CRETE

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ABSTRACT

The most discussed natural catastrophe in the Mediterranean region is the major eruption of the Thera volcano. The third Thera and the Aegean World (1989) conference reached some agreement on its relative chronology: the catastrophe came when the Late Minoan IA pottery style was in use. The more recent identification of tephra at Mochlos (1995), however, suggests that the eruption occurred when the LM IA pottery was at its very end. It, in fact, started off the LM IB pottery style – the marine style.

Irrespective of the exact absolute date of the eruption, an attempt will be made to pinpoint the effects it had at the Central Palace Sanctuary at Knossos.

KEYWORDS: Thera volcano eruption, tsunami, temple repositories.

INTRODUCTION

There is perhaps no other volcano eruption discussed so fervently, as the eruption of the Thera volcano in the Late Bronze Age. And it would not have been discussed so much, if it had not been connected with the extensive destructions of palatial sites in Minoan Crete (Marinatos 1939; 1968; Hood 1973, 113, 117; Niemeier 1980, 75; Macdonald and Driessen 1997).

In this paper, the evidence related to the destruction of the Central Sanctuary at the Palace of Knossos (fig. 1) (Evans 1902-3; 1921; Panagiotaki 1999) will be reviewed and new evidence will be brought in to support the possibility that its destruction was caused by the earthquake(s) that immediately preceded the final Thera volcano eruption in the Late Minoan IA period.

DISCUSSION

Marinatos, even before he excavated at Thera, argued that Minoan Crete was destroyed by a tidal wave or tsunami that was generated by the eruption of the Thera volcano (1939). The idea, although fervently discussed by many scholars over the years, has not been solved and remains controversial. Antonopoulos (1992) and LaMoreaux (1995) among others, after close examination of both the scientific and the archaeological evidence, supported Marinatos' theory. Minoura *et al.*, (2000), on the other hand, although their study confirms the invasion of a tsunami, they reject the idea that it caused any serious damage to the Minoan civilization (on the Thera volcano eruption and the tsunamis that followed it, see the more recent discussions of Papazachos *et al.* 1991; Papadopoulos *et al.* 2001; Papadopoulos 2003; McCoy *et al.* 2000; 2000/02; Driessen and MacDonald 2000; Dominey-



Fig. 1: The Central Sanctuary at Knossos as found in 1900 by Sir A. Evans (Courtesy of the Ashmolean Museum and Sir A. Evans's trustees).



Fig. 2: The most important artefacts from the Temple Repositories as arranged by Sir A. Evans (Courtesy of the Ashmolean Museum and Sir A. Evans's trustees).

Howes 2002; Stefanakis 2006, with the relevant bibliography).

Macdonald and Driessen (1997), who reviewed the archaeological evidence of destructions in Minoan Crete, have confirmed that Late Minoan IA sites were greatly affected: they were either completely or partly destroyed whether due to earthquakes, ashfall or tidal waves (tsunami). They favoured the idea that most of the damage in Crete was caused by the earthquake(s) that preceded the eruption (see below). Among the sites affected must have been Knossos and as I have already argued, what Evans called the Central Sanctuary at the palace of Knossos was destroyed (Panagiotaki 1998, 1999). After its destruction, the most precious artefacts (most of which broken) were collected and buried in two large underground cists, the

Temple Repositories (figs. 2 and 3) (Evans 1902-3; 1921; Panagiotaki 1993; 1998; 1999). The material recovered from the Temple Repositories (mostly faience items and clay vases) forms the centre of the discussion in this paper (fig. 2).

In order to relate the destruction of the Central Sanctuary of the palace of Knossos with the Theran destructions (seismic or volcanic), one encounters two major problems: the first is connected with the date of the Thera volcano eruption with the related earthquake(s) and the second is associated with the date of the artefacts from the Central Sanctuary, sealed in the Temple Repositories.

The first problem, we thought, was solved at the third Theran Conference in 1989 (*Thera and the Aegean World III*), when some agreement was reached on its



Fig. 3: The Temple Repositories at the time of excavation in 1903 by Sir A. Evans (Courtesy of the Ashmolean Museum and Sir A. Evans's trustees).

relative chronology: the catastrophe came when the Late Minoan IA pottery style was in use, perhaps at around 1600 BC. However, Doulas (1990, 49), on more recent evidence, developed the idea that a severe earthquake preceded the eruption and that both the earthquake and the volcano eruption occurred in the mature Late Minoan IA period. Doulas (1990, 48) also suggested that the time between this final or pre-eruption earthquake, which caused the abandonment of Akrotiri, and the eruption 'was a very short period', perhaps only a few months. Other scholars, however, proposed a longer period (Warren 1991, with earlier bibliography). More recently Macdonald and Driessen (1997, 87) proposed that the earthquake that caused the destructions at Thera and Crete

may have been a tectonic one, since tectonic earthquakes are more catastrophic than earthquakes related to volcano eruptions, which tend to be more localized and therefore less widely catastrophic. This pre-eruption earthquake might have in reality triggered the volcano eruption as it happened in 1650 AD with the Kolombos island, just off Thera (Fytikas *et al.* 1990, 189; Macdonald and Driessen 1997). However, LaMoreaux explains the extensive catastrophes as the result of the collapse of the volcano cone: 'Based on our recent experience with volcanic activities in the United States, there must have been major earthquake damage 805 km away in Asia Minor and North Africa' (1995, 173).

It is thus possible, that the destructions in Crete as well as contemporary

destructions in the Cyclades and the Dodecanese, where ash fell after the destruction (Doumas and Papazoglou 1980; Marketou 1990, 100-113; 1998a), were caused by the earthquake that preceded the eruption (discussed by Doumas 1990) or the earthquake that was caused by the collapse of the cone of the volcano that must have generated the tsunami. Evidence in Crete, can illustrate the sequence of earthquake damage followed by the fall of volcanic ash. At Palaikastro in east Crete, for instance, a building had been damaged and dismantled before ash fell (MacGillivray and Sackett 1994) and most importantly at the island of Mochlos, off the coast of again east Crete, a layer of ash, of 5 cm thick was discovered in a small courtyard between two floors: a Late Minoan IA and a Late Minoan IB, suggesting that the ash fell before the Late Minoan IB pottery style was in use, perhaps in mature Late Minoan IA (Soles and Davaras 1990; Soles et al. 1995). Similar evidence comes from the island of Pseira (Betancourt *et al.* 1990, 98).

The period between the two events (the earthquake that preceded the eruption and the eruption itself, accompanied by the earthquake from the collapse of the cone of the volcano) must have been very short as supposed by Doumas (1990) and is not therefore of major consequence in this discussion. What is important is to relate the destruction of the Central Sanctuary with the Theran destructions in mature Late Minoan IA. Of course most of the pottery recovered from the Temple Repositories is earlier but pottery should not be seen as the only tool for dating any more; yes, it is a major tool, but now there are other means which should not be underestimated, namely seals and sealings, faience and glass. However, the more traditional dating tool will be discussed first

– the pottery - and then the other materials, especially faience and glass.

Dating the Temple Repositories clay vases (fig. 3) involves three problems. Firstly, they can only be dated on the basis of their decoration and surface treatment since they do not come from stratified occupation layers; secondly, they are all large closed vases which do not change in style as rapidly as small fine wares, which are naturally easier to date; thirdly, they fall at the centre of the controversy over the distinction between Middle Minoan IIIB and Late Minoan IA pottery. This last problem, although extensively discussed is still unresolved (Hood 1966; 1996; Popham 1967, 337-8; Cadogan 1983, 511; Warren and Hankey 1989, 54-65; Panagiotaki 1998, 185-98; 1999).

Arthur Evans (1902-3, 49) saw the Temple Repositories vases originally as Late Minoan IA and later as typical Middle Minoan IIIB (1921, 550, 596). Pendlebury (1939, 180), on the other hand, put forward the idea that we should call the 'post-seismic MM IIIB pottery ... LM Ia'. Neither of the two had seen the Akrotiri vases. Platon (1973, 241-53) dated the Temple Repositories vases as Middle Minoan IIIB - Late Minoan IA although he pointed to their similarity with many vases from the destruction layer at Akrotiri in Thera. Marthari (1990, figs 9-10; 1993) identified a number of vases similar to the Temple Repositories ones in the final destruction layers of Thera, but following Evans' date - MM IIIB - she called them Minoan heirlooms. Warren and Hankey (1989, 54-65), on the other hand, placed the Temple Repositories vases in a mature Late Minoan IA phase, essentially because some of them are close to vases from Thera.

More recently, after identifying all the vases from the Temple Repositories in the various museums, I proposed that although

the majority belongs to the Middle Minoan IIIB date, a few bear characteristics of the vases of the early part of the Late Minoan I A phase (Panagiotaki 1998; 1999). At the same time, I emphasized the importance of other materials as dating tools. The importance of faience, for instance, had been already proposed by Betancourt, who had suggested, that although most of the clay vases are of MM III date, the existence of a vase with dark-on-light spirals and the faience items decorated with dark painted flowers ‘raise the possibility that they are at the edge of the next phase’ (1985, 103-4).

To go back to pottery, epigrammatically, the most characteristic painted decoration on clay pots of the mature Late Minoan IA phase, according to Macdonald and Driessen (1997, 19-20) is the “floral patterns which carry on into Late Minoan IB” and also “the combination of zones of

spiral and zones of foliate bands or grasses ... frequently with added white highlights and even a contrasting zone of white spirals on a dark ground.” The dark-on-light technique in painting and a lustrous surface are also characteristic of the pottery of the Late Minoan IA phase. The most distinctive Late Minoan IB painted decoration is the marine style with lots of marine creatures including octopuses, sea shells and argonauts.

With this as a basis, *no* clay vases from the Temple Repositories could have belonged to the Late Minoan IB horizon, since none have been decorated in the marine style. The general picture of the vases decorated mostly with white spirals on a dark ground, points to Middle Minoan IIIB or MM IIIB/LM IA. However, there are some vases that on stylistic grounds and on their surface treatment could have belonged



Fig. 4: Clay vase from the Temple Repositories



Fig. 5: Clay vase from the Temple Repositories

to the Late Minoan IA phase: One vase is decorated with what looks like crocus buds or tulips (fig. 4), two others have reed decoration – and they are in the dark-on-light as well as light-on-dark technique with white highlights: reed or wavy lines. A single vase displays features of the mature

Late Minoan IA phase as defined above: it has a lustrous surface and is decorated with tortoise shell ripple and a zone of spirals in the dark on light technique; it is further decorated with white highlights: a zone of spirals and wavy bands (fig. 5). It is significant that a similar, if not identical vase, has been recovered from the destruction layers of the West House at Akrotiri (Marthari 1990, 63-64, fig. 10; 1993) and was naturally seen as of MM IIIB date only because Evans had attached this date to the Temple Repositories. Evans, however, saw the Temple Repositories material as the result of the great catastrophe that preceded the ‘Great Rebuilding’ and it is, I think now evident, that we are all talking of the same event, but name it differently: Evans called it an MM IIIB destruction and later scholars LM IA.

Apart from the vases other artefacts from the Temple Repositories have been dated to the LM IA phase rather than earlier. Some of the sealings have been seen as of LM I date on the basis of their type and on their decoration (Weingarten 1989; Pini 1990;



Fig. 6: Faience vases from the Temple Repositories



Fig. 7: Faience dress model from the Temple Repositories

Panagiotaki 1995; 1999, 116). Of the same date is most of the faience recovered from the Temple Repositories: two tall cups (fig. 6) - that may be the equivalent of small clay vases - are decorated with plants recalling the typical Late Minoan IA floral decoration on clay pots in the dark-on-light technique. The faience dress models (fig. 7), among other objects from the same deposit, are decorated with crocuses portrayed in the typical Late Minoan manner, and in the dark-on-light technique, characteristic of the Late Minoan IA ceramic phase. Various flowers in the round made of faience were also found (fig. 8). Most importantly, a large number of marine creatures in the round, again made of faience, was included in the Temple Repositories: sea shells (fig.

9), flying fish (fig. 10), a vase in the shape of a triton shell (fig. 11), argonauts, even representations of rocks. Furthermore, one vase in the form of a bowl has a pronounced rim, what we would call in ceramic terms a 'ledged rim' (typical of the LM IA phase in ceramic terms, see Macdonald and Driessen 1997, 19), decorated with relief cockle shells.

As stated above, marine representations on pottery are typical of the Late Minoan IB ceramic phase. Why should we see the marine objects made of faience as of Middle Minoan IIIB and not of Late Minoan IB date? Because, one could argue, faience was a luxury material, worked by palatial artists, who in reality set the fashion, so one, could allow some time between the production of the luxury pieces of art and the most mundane objects, meaning the clay vases. The faience marine objects from the Temple Repositories could, in this light, be earlier than the clay pots with marine representations. But how much time should



Fig. 8: Faience flowers from the Temple Repositories



Fig. 9: Faience cockle shells from the Temple Repositories.

one allow between the production of the faience objects and that of the clay vases? In other words how big is the gap between the Temple Repositories faience and the Late Minoan IB clay vases? Surely not 75 years, which is what some pottery specialists, have suggested.

On pure logic, the clay marine style vases, which are considered typical Late Minoan IB, should not be far removed in time from the Temple Repositories marine items of faience. The Late Minoan IB potters who produced the marine style clay vases must have belonged at least to the same generation as the artists that produced the Temple Repositories faience objects and perhaps the fresco painters that painted the grand mansions in Thera (Doumas 1992,

116-21) and most importantly the tables of offerings from Thera (fig. 12) decorated in the marine style, especially the one from the West House decorated in the fresco technique with a real Minoan seascape with dolphins, rocks and seaweed (Immerwahr 1990, fig. 4c). This idea of course implies that the destructions did not stop the cultural development at Knossos and thus the artistic elements seen in the Temple Repositories are carried on to the Late Minoan IB period.

To support this idea further, one should compare the faience plaque from the Temple Repositories (Evans 1921, fig. 366; Panagiotaki 1999, fig. 17) that depicts a wild goat (fig. 13) and the known painting from Thera with two antelopes (Doumas

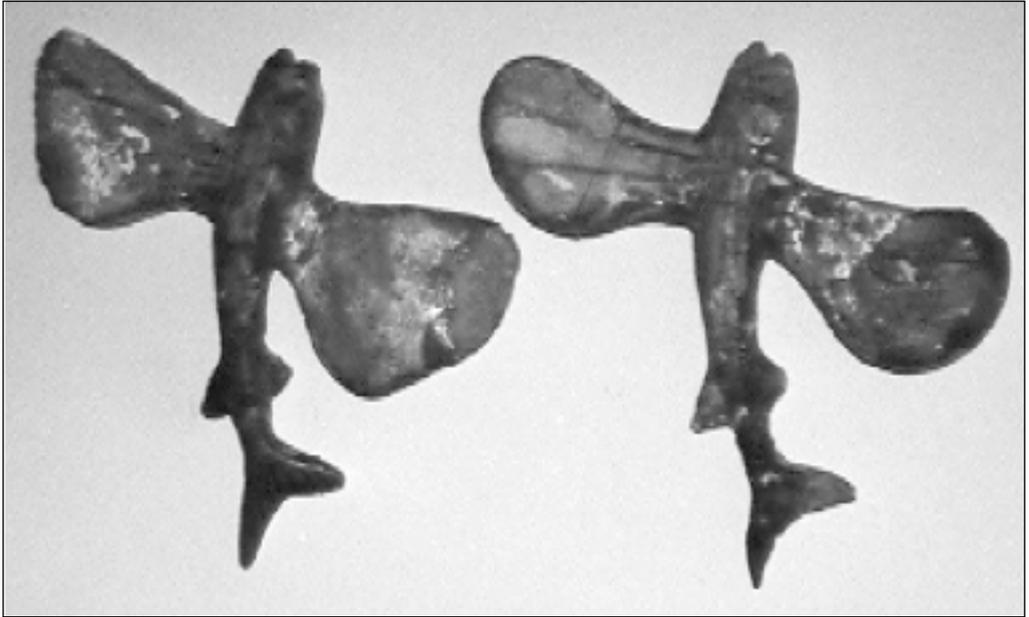


Fig. 10: Flying fish from the Temple Repositories



Fig. 11: Faience vase in the shape of a triton shell from the Temple Repositories



Fig. 12: Table of offerings from Akrotiri, Thera



Fig. 13: Faience plaque with a wild goat in relief from the Temple Repositories.

1992, pl. 83): the animals are presented in similar ways, despite the difference in the medium. It is also significant that the flounced skirt of one of the faience figures (fig. 15) from the Temple Repositories, has no earlier analogies (Evans 1921, 377; Panagiotaki 1999, fig. 25), on the contrary, all analogies are later (for Archanes, Sakellarakis 1991, 53; for Mycenae, Evans 1921, fig. 116; for Trianda, Marketou 1998b, figs 7, 10; for Minet el Beida, Frankfort 1970, fig. 307) and they naturally recall the ladies with flounced skirts in the frescoes decorating again, the large mansions at Akrotiri (Doumas 1992, 116-21).

One most recent piece of evidence from the Temple Repositories points in the same direction: it is an item made of glass – the earliest to now glass found in the Aegean. It is perhaps a pommel (fig. 16) for a sword or scepter of the pear-shaped type. It was recorded, in the Heraklion Museum

inventories, together with all the faience objects recovered from the Temple Repositories and was identified recently by the author. As Evans tended to carry to the Heraklion Museum groups of items from the same deposit and they were recorded in the inventories all together, there is a very high possibility that the glass pommel was found in the Temple Repositories. The raw material of the pommel, if not the pommel itself, must have come from either the Near East or Egypt. Raw glass started to come to the Aegean at the very end of the LM IA, and there is evidence of its being worked at Knossos itself, in the LM IB period (Cadogan 1976; Panagiotaki *et al.* 2004). It should be pointed out that it is generally accepted by glass specialists that glass came to Egypt originally from the Near East in about 1550 B.C., or early xviiith Dynasty (Nicholson 1993). One presumes that since Egypt had closer connections with the Near



Fig. 14: Antelopes fresco from Akrotiri, Thera.

East than Crete, glass should reach Egypt earlier than Crete. If the Temple Repositories material is considered of Middle Minoan IIIB or early Late Minoan IA date, it is implied that glass came to Crete earlier than it did to Egypt. And if the high absolute date of the Thera volcano eruption - middle of the 17th century – (Manning 1988; 1990; 1995; Betancourt 1988) is followed instead of the low - middle of the 16th century – (Warren and Hankey 1989; Warren 1991), it is further implied that glass came to Crete at least 100 years earlier than it did to Egypt, something really difficult to believe. Thus, on the evidence provided by the material of the Temple Repositories, meager as it might be

considered, the low chronology scheme of the Thera volcano eruption fits better, despite the fact that all the scientific analyses point to the high chronology in the middle of the 17th century. The gap between the high and low chronology based on the scientific analyses could be bridged by the idea expressed by LaMoreaux (1995, 172-173) that there were a series of eruptions of the Thera volcano starting in ‘about 1628 BC,’ and ending with ‘the final major eruption in 1450 BC’, implying that the ash analysed could belong to the earliest eruptions. The Central Sanctuary destruction would fit perfectly into the low, final eruption or even the middle of the 16th century BC.



Fig. 15: Faience 'snake goddess' from the Temple Repositories.

CONCLUSIONS

Although most of the pottery from the Temple Repositories is dated to the Middle Minoan IIIB or early LM IA period, there is now convincing evidence to lower this date to within the time of the final eruption of the Thera volcano. This evidence is based on the vases discussed above displaying typical features of LM IA vases, especially (fig. 5), which bears characteristics of the vases of the Late Minoan IA mature phase. Also the sealings and most importantly the faience items decorated in the most typical LM IB



Fig. 16: Glass pommel from the Temple Repositories.

(in pottery terms) style, the so-called marine style. The last and most recent piece of evidence comes from the newly identified glass pommel (fig. 16), arguably found in the Temple Repositories, that cannot be dated earlier than the mature Late Minoan IA phase. This implies that the Temple Repositories material is close in date to that buried by the eruption at Akrotiri in Thera and justifies the recovery of so many vases of the Temple Repositories type in the destruction layers at Akrotiri. Thus the destruction of the Central Sanctuary at the palace of Knossos represented by the Temple Repositories material was caused by the final seismic activity (or activities) immediately preceding the final Thera volcano eruption, perhaps in the 16th or even the 15th century BC.

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