

# AN ASTRONOMICAL INTERPRETATION OF FINDS FROM MINOAN CRETE

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## BACKGROUND

Arguments are presented that the figurines found on the Minoan peak sanctuaries on Petsophas and Traostalos, eastern Crete, are symbols for celestial bodies and are further evidence that those two hilltops were places for the observation and study of the heavenly objects. The orientations of the two sites and the proposal that they were used for observing celestial events, for keeping a calendar and for learning stellar navigation have been presented earlier.<sup>1</sup> The finds have not been discussed in the literature from an astronomical point of view.

Petsophas (H. 255 m) was first excavated early this century<sup>2</sup> and Traostalos (H. 515 m) in the 1970s<sup>3</sup>. The identification of both sites as Minoan Peak sanctuaries and the dating of them to the periods MM I - LM I (ca 2000-1600 BC) is generally accepted. That is the time when the Minoan culture was at its height. There is no evidence for any activities at the two sites during LM II-III, which means during the period of the Mycenaean hegemony. On both hilltops many small terracotta figurines were found. More than 2000 have been recorded: mainly animals, small human figurines and human anatomical parts. There was also a small structure at each site.



Figure 1.  
Map of  
Eastern  
Mediterranean  
with  
Petshopas  
and Traostalos



Both of these places have free view of the horizon from the Northwest over the East to about Southeast and both lie close to the Mediterranean shore (*Fig. 1*). There is clear evidence in the archaeological record that the Minoans in this area had contact with other peoples to the East and Southeast, e.g. the Egyptians.

The British archaeologist J. L. Myres was the first to publish the finds from Petsophas.<sup>4</sup> Very few finds from Traostalos are published but they are of the same types as those from Petsophas.

## THE PREVAILING INTERPRETATIONS

The human anatomical parts have been interpreted as votive offerings in a healing cult and the animals as offerings in an agricultural fertility cult. The human figurines have been considered to represent either Minoan divinities or the persons who used the sanctuaries for religious reasons. Two or more cults are thus thought to have existed on these two hilltops: one healing cult for humans, one farmers' cult of fertility and, most likely, some other cult involving the human figurines. Many articles with minor variations of these views have been published and very few later scholars have questioned them.<sup>5</sup>

In order to see if the finds from Petsophas and Traostalos conform to those from the later healing cults, tables were made comparing the finds with those from four sanctuaries with known healing cults, three dedicated to Asclepius and one modern church to the Holy Spirit. The finds are from Athens<sup>6</sup>, Corinth and Lerna<sup>7</sup>, Tessennano<sup>8</sup>, and the modern church to the Holy Spirit on the site of the Minoan peak sanctuary on Vrysinas<sup>9</sup>. See *Table 1* for the items where the differences are significant.

We can see that there are major differences between the finds from these Minoan sites and those from the sanctuaries with healing cult. Some simple items, such as arms and legs, may hint at a healing cult, but some of the most common items in healing cults, such as eyes, ears and all parts involved in human reproduction, are lacking from the Minoan hilltops. The great scholar of Greek religion Martin P. Nilsson stressed this difference<sup>10</sup>. There are also several peculiar bodily parts found on the peaks but not found in the later healing cults, e.g. female lower half, male lower half, male upper half, male right half.

**TABLE 1.** *Items found on Petsophas and Traostalos compared with finds from later healing cults. Only those parts are included where there are significant differences.*

	PETSOPHAS AND TRAOSTALOS	HEALING CULTS
Arm	253	14
Body, female, lower part	5	0
Body, male, lower half	1	0
Body, male, upper part	1	0
Body, male, right half	6	0
Face	2	12
Feet	6	99
Hand	27	55
Head, sex unknown	57	1

	PETSOPHAS AND TRAOSTALOS	HEALING CULTS
Head with flying hair	3	0
Head, male	11	110
Limbs, parts of statuettes	728	10
Full human body on base	8	0
Sitting human	1	2
Statuette, female	120	26
Statuette, male	128	15
Statuette, unknown sex	17	77
Torso, female	17	0
Torsos, male	39	1
Torso, no head, no arms	9	0
Body part, half, unknown sex	0	1
Body part, unknown sex	0	37
Breasts, female	0	43
Ear	0	44
Eyes	0	146
Face, half	0	2
Fingers	0	5
Genitalia, female	0	6
Genitalia, male	0	185
Head, boy	0	18
Head, grotesque	0	1
Heads, half, male	0	9
Head, upper part	0	1
Hips	0	2
Internal organs, excluding heart	0	51
Jaw,	0	2
Mouth, neck, nose, teeth	0	11

	PETSOPHAS AND TRAOSTALOS	HEALING CULTS
Part of a statue	0	32
Statuette, back of human	0	1
Statuette, child or "temple boy"	0	5
Statuette, female, banqueter	0	A number
Statuette, grotesque	0	1
Statuette, horse and rider	0	2
Stomach, abdomen	0	5
Thigh bone	0	1

We can conclude that the constitution of finds from Petsophas and Traostalos do not agree with that from the later healing cults. The spread of the figurines all over the plain around the buildings on the peaks, the simple structures, the lack of an altar and bones from animal offerings do not indicate that the two sites were sanctuaries to any farmers' cult. All of the cattle figurines are bulls; no cow has been identified. It is also clear that not all of the animal figurines represent animals that would have been of economic interest to farmers. Weasels and tortoises can not have had the same importance as sheep but are shown with the same amount of detail and in the same size. The sanctuaries for the healing cults were normally placed near springs. The location of Petsophas and Traostalos, however, are at sites, without any water nearby.

These facts place in question the prevailing interpretation for the finds.



Figure 2. Bull's leg. Compare the Egyptian icon for the Big Dipper and items: AM AE 1006, BM 1907/10-19/25<sup>22</sup>

## AN ASTRONOMICAL INTERPRETATION

Blomberg and Henriksson have shown that part of Aratos' description of the sky is based on old star positions, some of which were correct during the Middle Bronze Age,<sup>11</sup> indicating an old tradition for the study of the stars in Greece, a tradition that seems to derive from the period when our figurines were made. Aratos' description may thus be used as comparative literary material for an astronomical interpretation of the figurines from these sites. Especially important is the way the constellations and stars are described as moving through the night, following upon each other.

When studying these figurines we should remember that in classical Greek ζῳίδιον (diminutive of ζῶον), is used for a small figurine, a painted or carved statuette, as well as for a sign of the Zodiac<sup>12</sup>. The word is also used for animals, as in the signs of the Zodiac. This can indicate that small statuettes were used to picture the constellations and the word became the same for both the statuettes and for the constellations they depict, as the statuettes were regarded as constellations.

Some correspondences amongst the figurines, known iconographical symbols, and astronomical texts:

To the Southeast of Crete we have Egypt with calendars based on the positions of the heavenly bodies. Especially relevant are those that de-

scribed how the time passed during the night, the so-called diagonal calendars<sup>13</sup>. Here there is a parallel in their symbol for the Big Dipper, a bull's leg. Such separately made bull's legs – it is clear that they were made separately - are amongst the figurines found on the two hills (*Fig. 2*)<sup>14</sup>.

When the constellations were formed it seems that few individual stars had their own names. They were identified instead by their position in the constellation, for example the heads of the Twins, the knees of the steadfast Charioteer etc.<sup>15</sup> Some of the brightest stars, however, may also have had their own names, for example Arcturus in Boötes<sup>16</sup>

Amongst the terracotta figurines from the peaks there are a number, which seem to be counterparts to the constellations. Compare especially:

FIGURINE	CONSTELLATION	ANCIENT REFERENCE	FIGURE
<i>Female sitting</i>	Cassiopeia	Aratos l. 189. Compare item HM 3426 <sup>17</sup>	
<i>Animal, hind part in loop,</i>	Cetus	Aratos <sup>18</sup>	3
<i>Goat - Agrimi</i>	Capricornus	Aratos l. 285	4
	Capricornus' horn <sup>19</sup>	Hipparchos 3.2.6,3.3.7 <sup>20</sup>	
<i>Bird with folded wings</i>	Aquila	Aratos l. 315	5
<i>Bird with outspread wings</i>	Cygnus	Aratos l. 487	6

When Aratos described the movements of the stars during the night he used a part of a constellation to identify an individual star or a small group of stars, parts we can recognise amongst the finds:

ARATOS TEXT	FIGURINE TYPE	ARATOS	FIGURE
"The Phantom sinks all save knee and left foot"	A foot up to the knee	590-595	7
Arctophylas sinks wholly "save his never setting left hand"	A hand and forearm	721 f	8
"so the weary hands and knees and shoulders of Andromeda are parted"	Half human body	704 ff	9

In some cases we have constellations that earlier had different names and thus can be identified:

EARLY NAME	MODERN NAME	COMPARE item no.	ANCIENT ref. and comments
Tortoise	Lyre	FM GR 173/1907	Aratos l. 268
Shoe (Καρκίνοζ)	Cancer's claw	HM 3461	Aratos l. 147, means also claw.
Beetle (Καράβοζ)	Cancer	HM 3468	



Figure 3. *Creature, hind part in loop*, Cetus, Compare the map in the Loeb Aratos edition pages 444-447 and item: AM AE 1846.

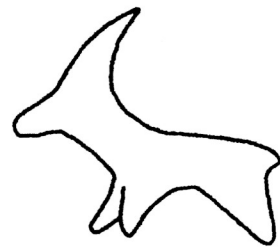


Figure 4. *Goat - Agrimi - Capricorn*. Aratos l. 285. Compare: BM 1907/1-19/34. FM GR 172/1907.

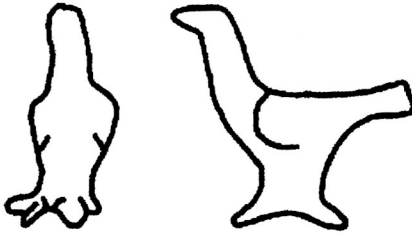


Figure 5. *Bird with folded wings – Aquila*. Aratos l. 315. Compare: BM 1907/1-19/59, and 19/36.

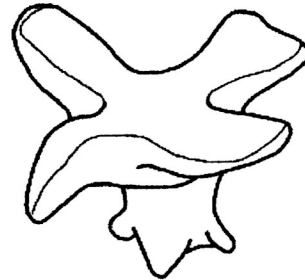


Figure 6. *Bird with outspread wings - Cygnos*. Aratos l. 487. Compare: HM 3463, AM AE 996.



Figure 7. *Lower leg with foot*. Aratos 590-595. Compare: HM 3458, HM 3459.



Figure 8. *An arm*. Aratos 721-724. Compare: HM 3447, HM 3448.



Figure 9. *Right half of human body*. Aratos 704 ff. Compare: HM 3443, HM 3444.

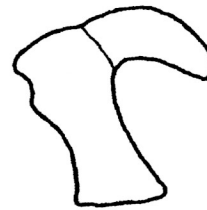


Figure 10. *Head with long hair*. - A comet. Κομήτης means *Head with long hair*. Compare: HM 4855, HM 4856.

Cancer was figured like a tortoise in Egypt around 4000. In the Egyptian records of about 2000 BC it was described as a scarabaeus, "This was the Greek *καράβος*, with its nest-ball of earth in its claws" i.e. the horned beetle.<sup>21</sup>

It may well be that Minoan contact with Egypt had some influence on how they saw the sky, as they seem to have had a constellation Sheep and a Bull's leg. However, we do not know which group of stars they called the Sheep. The Minoan figurines which have been identified as sheep could also have represented the constellation Aries, even if both male and female sheep are found.

There are indications that other celestial phenomena were shown as well, for example comets. The Greek word *Κομήτης* means *Head with long hair*. It is proposed that the figurines showing a head with long hair represent a comet (Fig. 10).

We find, in fact, that almost all figurines can have the same ideological explanation. More than 90 % of the finds can be seen as representing constellations, parts of constellations or other heavenly objects as they are described or known from texts or figures.

It has thus been shown that one explanation can account for figurines from the peak sanctuaries. I may also add that none of the figurines contradict this explanation.

## SUMMARY

It is argued that the Minoans on Eastern Crete from about 2000-1600 BC (MM I - LM I) used figurines to study and learn the motions of the heavenly bodies. The figurines are understood as symbols for constellations, parts thereof and other bodies in the sky, such as comets. Of the more than 2400 small figurines found on Petsophas and Traostalos over 90 % agree with such a use. In the study of the figurines, Aratos' text *Phainomena* was used as parts of his description of the constellations seem to be based on old traditions, the oldest being from the Middle Bronze Age. His information on how the constellations follow upon each other during the night is of special interest in understanding some of the figurines, i.e. the anatomical parts.

## NOTES AND REFERENCES

1. G. HENRIKSSON & M. BLOMBERG "Evidence for Minoan astronomical observations from the peak sanctuaries on Petsophas and Traostalos", *Opuscula Atheniensi*, 21, (1996), 99-114. M. BLOMBERG & G. HENRIKSSON, "Evidence for the Minoan origins of stellar navigation in the Aegean" in *SEAC 97: Proceedings of the fifth international conference of the European Society of Astronomy in Culture* (Gdansk 1997), 67-76.
2. J.L. MYRES, "Excavations at Palaikastro, II. §13 - The Sanctuary-Site of Petsofà", *Annual of the British School at Athens*, 9, (1902-1903), 356-387.
3. C. DAVARAS, "Crete", *ArchDelt*, 33, B: 2, (1978) *Chronika*, 392f., s.v. *Petsophas and Traostalos*.
4. MYRES (supra n. 2). Almost all figurines from Myres' excavation are published in B. Rutkowski, *Petsophas. A Cretan peak sanctuary*, (Studies and monographs in Mediterranean archaeology and civilization, series. I, vol. I), (Warsaw 1991). All objects discussed in this paper are shown in that book.
5. MYRES (supra n. 2); RUTKOWSKY (supra n. 4), 52-57.
6. S.A. ALESHIRE, *The Athenian Asklepios, the people, their dedications, and the inventories*. (Amsterdam 1989).
7. C. ROEBUCK, *The Asklepios and Lerna*, (Corinth 14), (Princeton 1951), 111-146.
8. S. UNGE SÖRLING, "A collection of votive terracotta's from Tessennano (Vulci)", *Medelhavsmuseet, Bulletin* 29, (Stockholm 1994), 47-54.
9. The metal votive plaques in the church according to inventory made by the author 18 June 1998.

10. M. P. NILSSON, *The Minoan-Mycenaean religion and its survival in Greek religion*, (Acta Re. Societatis humaniorum Lundensis IX), 2nd ed., (Lund 1968), 74.
11. M. BLOMBERG and G. HENRIKSSON, "New arguments for the Minoan origin of the stellar positions in Aratos' *Phainomena*", in *Proceedings of Oxford VI*, (La Laguna 1999). In this study two editions of Aratos' *Phainomena* are used: Loeb classical Library, transl. By G.R. Mair, (Cambridge 1955) and later printings; D. KIDD, *Aratus Phaenomena*, (Cambridge Classical Texts and Commentaries, 34) (Cambridge 1997).
12. ARIST. *On the Cosmos*, 2.392a 12-14, Metaph. 1073b 20, Aratos I. 544, E.J. WEBB, *The names of the stars*, ed. I. Bulmer-Thomas, (London 1952), 82 n. 1.
13. B.L. VAN DER WAERDEN, *Science awakening II The birth of astronomy*, (Leyden and New York 1974), pp. 14-16; O. NEUGEBAUER and R.A. PARKER, *Egyptian astronomical texts*, I-III, (London 1960, 1964, 1969).
14. MYRES (*supra* n. 2), 376.
15. ARATOS I. 480ff.
16. HENRIKSSON and BLOMBERG, 1996, (*supra* n. 1), 113.
17. All comparative material is shown in Rutkowski, (*supra* n. 4), the objects are referred to by their inventory number. The following abbreviations are used: HM Heraklion Archaeological Museum; FM GR Fitzwilliam Museum, Cambridge; BM British Museum; AM AE Ashmolean Museum, Oxford.
18. Compare the Cetus constellation shown on the star map in the Loeb edition of Aratos, 444-447.
19. RUTKOWSKI, (*supra* n. 4), 36 and pl. 49.13. The correct inventory is BM 1907/1-19/29.
20. HIPPARCHUS; *Hipparchi in Arati et Eudoxi Phaenomena commentariorum libri tres ad codicum fidem recensuit Germanica interpretatione et commentariis instruxit Carolus Manitius*, (Leipzig 1894).
21. R.H. ALLEN, *Star-names and their meaning*, New York 1899, second reprint 1936, also published under the title: *Star names, their lore and meaning*, (New York, 1963). Compare also Webb (*supra* n. 12), 143f.