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THE SIGNIFICANCE OF THEOPETRA CAVE FOR GREEK PREHISTORY

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INTRODUCTION

The cave of Theopetra lies in Thessaly, which is the most central department of Greece and contains the most extensive plain of the whole country. Numerous, at least 275 known Neolithic settlements were established there between the 7th and 5th millennia BC. For this reason, this area is characterized as the best expression of the Neolithic civilization in Greece (Fig. 1) (Neolithic Culture in Greece 1996: 201-4).

The cave of Theopetra is the westernmost prehistoric settlement of this plain. It actually lies on the edge of the plain and near the foothills of the eastern Pindus mountains, which are the natural borders between Thessaly and Epirus. In the latter area, a series of Palaeolithic sites and excavations are known (Bailey et al. 1983, Bailey 1986). The location of the cave near the small river Lethaios, a tributary of Peneios that crosses Thessaly, with the surrounding woodland and the mountains, where even today big game hunting is practiced, constituted a particularly attractive environment to hunters and gatherers, as well as to sedentary inhabitants later. The extent of the cave is about 500 sq m and it has a rather quadrilateral shape with conches in the edges. (Fig. 2). Its large and apsidal entrance is estimated to have worked as one more natural privilege for its inhabitants, at least in climatically ameliorated periods. The excavations in the cave began in 1987 and are still in process.

The special importance of this cave lies in the fact that it contains a long sequence of deposits ranging from the Middle Palaeolithic to the end of Neolithic and Chalcolithic and the transition from the Pleistocene to the Holocene (Kyparissi in press a). It is the only site in Greece where such a long sequence of deposits has been recognized up to now. Other caves, like Franchthi and Kleissoura in Peloponnese, Kleithi and Kastritsa in Epirus, and Gioura in the Sporades islands, have shown part of this sequence. In some of them, such as Franchthi and recently in Kleissoura and Gioura, the connection between the Pleistocene and the Holocene has appeared (Jacobsen 1976, Koumouzelis *et al.* 1996, Sampson 1996).

The first information about the presence of the Palaeolithic period in Thessaly came from the Palaeolithic finds in the banks of Peneios river, which came to light in the 1960s by the German Archaeological Mission directed by V.I. Milojcic (Milojcic *et al.* 1965). A long series of prehistoric excavations during the following decades in Thessaly focused mainly on Neolithic research. A new survey in 1987 in Thessaly by the American School at Athens, carried out by C. Runnels (Runnels 1988) located many other new sites with Palaeolithic material. But it is only in Theopetra cave that the transitional stages from the Middle to the

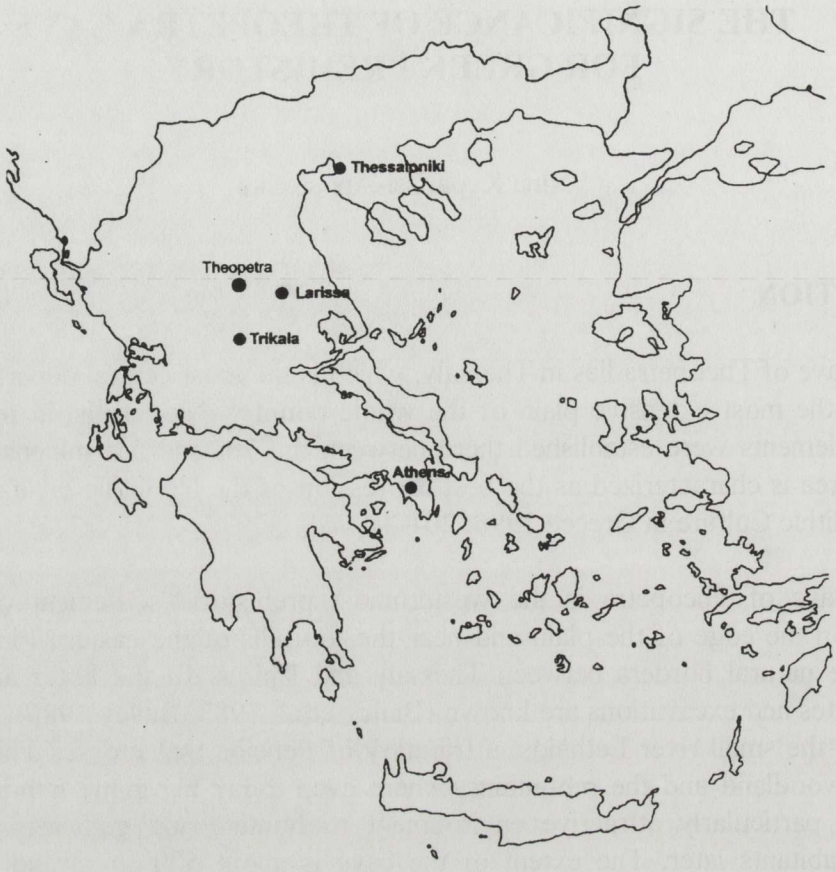

Fig. 1 Map of Greece, indicating location of the site of Theopetra.

Upper Palaeolithic, and from the Upper Palaeolithic to the Mesolithic and Neolithic are attested.

This paper will not describe in detail the deposits of the cave, as this has already been done in other papers (Kyparissi in press a and b). It will only deal with certain characteristics of the deposits, which display the uniqueness of this site.

EXCAVATION DATA

The deposits of Theopetra can be divided in two quite different periods: that of the Pleistocene and the other of the Holocene (Figs. 3 and 4). Quantitatively and morphologically, the stratigraphy of the Pleistocene and Holocene is absolutely different: that belonging to the Pleistocene reaches 4.50 m in thickness in the central area of the cave, where the thickest deposit is found, while that of the Holocene does not exceed 1.50-1.80 m in the same area.

The deposits at the edges of the cave (the East and South areas are only partly excavated) are thinner, reaching 3 m as a whole. From this fact we conclude that the level of the surface of the bedrock is irregular, higher in the edges and deeper in the central area of the cave. This was the reason why the central area was repeatedly filled with water-lain sediments during the Pleistocene, while the higher level of the edges did not retain them, or they never reached this level at all. These water-lain sediments are estimated (Karkanas in press) to have entered the cave partly through karstic aquifers ending in the cave and partly from the entrance. The latter is proved by the sloping course (from the entrance to the interior of the cave) of a thick consolidated sediment reflecting the last cold period of the Upper Palaeolithic. So the sequence of the stratigraphy during the Pleistocene is a thick sandwich of water-lain and consolidated sediments, with intervening loose soil deposits and hearths, while the stratigraphy of the Holocene consists of a sandy Mesolithic deposit and the quite different but more familiar Neolithic one, which in the main area of the cave is seriously disturbed.

These two big periods can be divided again in five different units, three for the Pleistocene (Middle and Upper Palaeolithic) and two for the Holocene (Mesolithic and Neolithic) (Figs. 3 and 4):

a) The deepest unit over the bed-rock consists of a thick (about 50-70 cm) water-lain sediment, where there is no presence of fire remains at all. The deposition of this sediment can be put to earlier than 50.000 BP, according to a C_{14} date (Fig. 5, DEM 133 and 140)[1] .The features of this sediment probably reflect a humid period (Karkanas in press).

Tools made of flint, which was possibly taken out of the limestone bedrock where it is found enclosed, and rather roughly worked, were found in this deepest sediment. They are the oldest specimens of lithic technology in Theopetra (and possibly in Thessaly). Quartz also seems to have been more popular in the older Middle Palaeolithic periods than in the later ones.

b) The second unit, with maximum thickness of about 2.50 m (Fig. 3) is all characterized by thick layers of extensive fires alternated with sandy silt loam layers. On the surface of these deepest fire remains, human footprints were found. Their length measures about 15 cm (14-15,5) and their width around 6 cm (6-6,5). This size fits to a child around five years old today. These fire remains were dated in 46.591 ± 1.665 BP (Fig. 5, DEM 613) which is the oldest date in Theopetra up to now, and is expected be even older with the use of other chronological methods.

The Middle Palaeolithic deposits of this second unit show a higher density in lithic tools, suggesting that this was likely a more populated period in the cave, though possibly not as a permanent base. These tools, made mainly of chocolate flint and less of quartz, are of high technological quality: the Levallois technique for the production of flakes, blades and points is well attested. There appears to be an overwhelmingly large production of side scrapers of several sub-types. Also present are backed knives, Mousterian points, notches, truncations and

[1] Sample taken out of the first fire over this sediment. All carbon samples are dated by NCSR Democritos, Laboratory of Archaeometry, Athens.

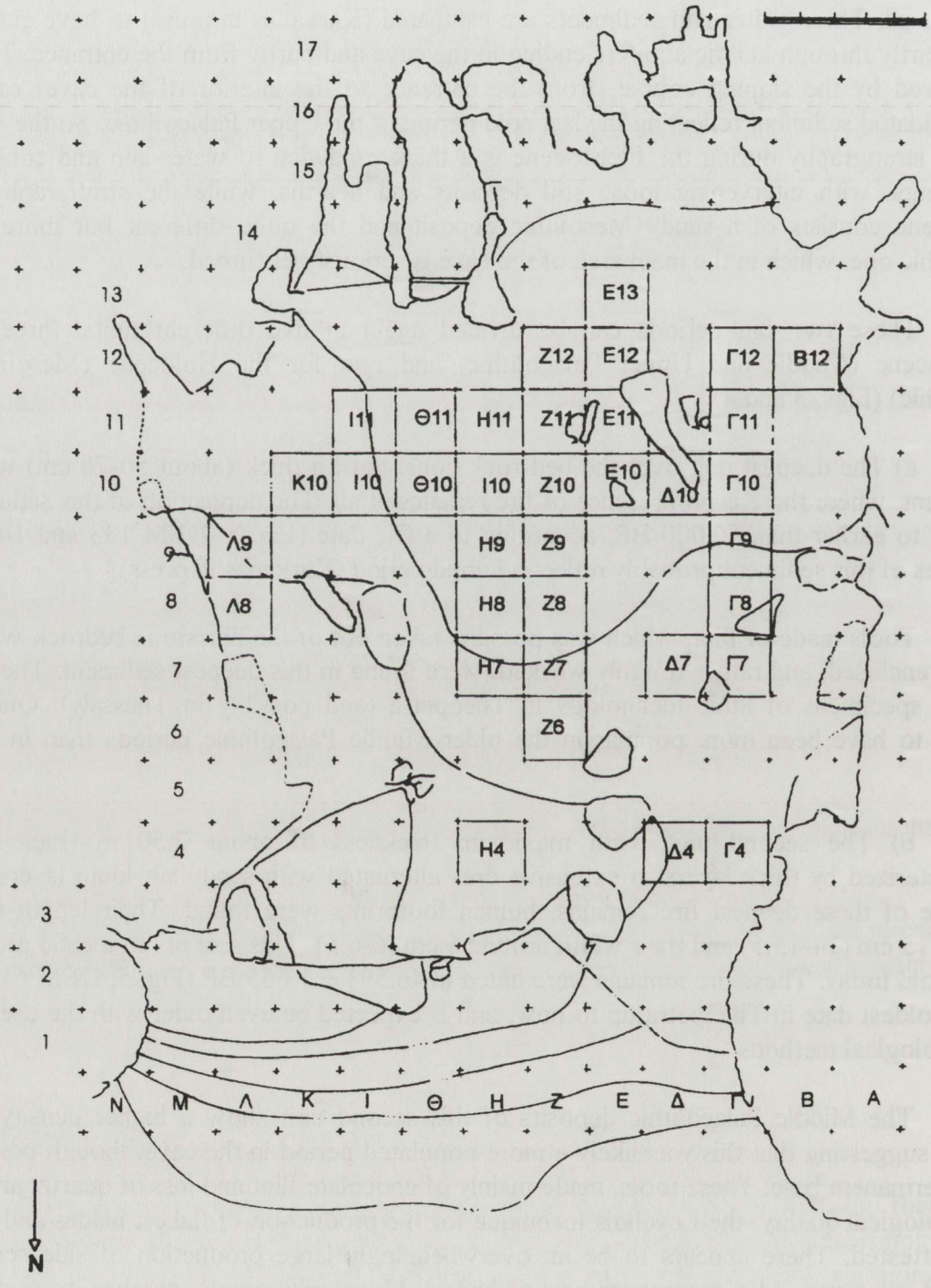

Fig. 2 Section plan of Theopetra cave with the excavated trenches (by Th. Hatzitheodorou and M. Driva, Ephorate of Palaeoanthropology and Speleology).

denticulates. Leaf points and bifaces are present in small numbers (Panagopoulou in press). According to C_{14} dates (Fakorellis and Maniatis in press) this period can be fixed between 46.000 (46.591 ± 1.665) and 25.000 (25.354 ± 2.132) years BP(Fig. 5. DEM 613 and 61). At the same time, an almost total absence of bones is observed in the central area. This was due to the physicochemical conditions of the soil that caused the dissolution of bones, as was testified after special analyses carried out by Prof. Steven Weiner and Dr. P. Karkanas at the Weizmann Institute in Israel[2]. In contrast, many well preserved bones of *Ursus spelaeus* and deer were found close to the eastern walls of the cave, but at that area there are no layers of loam deposits and of extensive fires. These are two quite different stratigraphies, which we try to explain and to correlate with each other.

c) The third unit starts with the formation of a thick (about 1.50 m) consolidated sediment, consisting of two superposed layers, unequally deposited, between which a less consolidated deposition intervenes (Figs. 3 and 4). All of these deposits belong to the same geological episode. The above-mentioned sediments are estimated to reflect cold climatic conditions, with probably less extreme features during the intervening space (Karkanas in press, Kyparissi in press a).

According to a C_{14} date, sampled somewhat deeper in the lower surface of this consolidated deposition, this must be younger than 25.000 BP (Fig. 5, DEM 61), which fits well to the Last Glacial Maximum period. The end of this deposition is estimated to be older than 12.000-11.000 BC. according to other carbon samples (Fig. 5, DEM 248, 249) taken from its surface. The latest date may well belong to the overlying deposits and in that case it is useful here only as *terminus ante quem*. A human skeleton dated to 14.620-14.380 BC (13.723 ± 60 BP) (Fig. 5, DEM 241) was found in this deposit and must belong to that cold period (Stavropodi *et al.* in press).

These deposits display a low density in lithic tools and other finds (fauna, carbon) implying a limited use of the cave by a smaller number of people. The difference is obviously due to deterioration of the climate. The relatively "ameliorated" interval between the two superposed layers seems to have been more populated, judging from the relatively higher density in lithic tools. In the same "ameliorated" layer, in an area covering more than 30 sq m - which is expected to be wider if all the squares are excavated - at least thirteen hearths have been uncovered, one close to the other. These hearths are all of the same type, with a surface of about 1 sq m each and covered by a vivid red material 10-15 cm thick. According to the chemical analysis of the ashes, this red material consists of aluminum oxide, potassium and phosphorus oxide. A black layer of fire characterizes all their bases. A few pulses and other seeds came out of them, as well as a small number of flint tools. But, as most of them have been kept intact, we do not yet know what else they could contain. Between the hearths a good number of clay cylindrical objects, probably slightly fired, were found. They were also found dispersed in other places of the cave. They represent attempts at some kind of plastic creation during that "ameliorated" period of the Late Upper Palaeolithic period. Masses of unfired clay are actually found even in the deepest Upper Palaeolithic layers, indicating possible

[2] I am indebted to Professor Steven Weiner for the analyses carried out under his supervision to the Weizmann Institute.

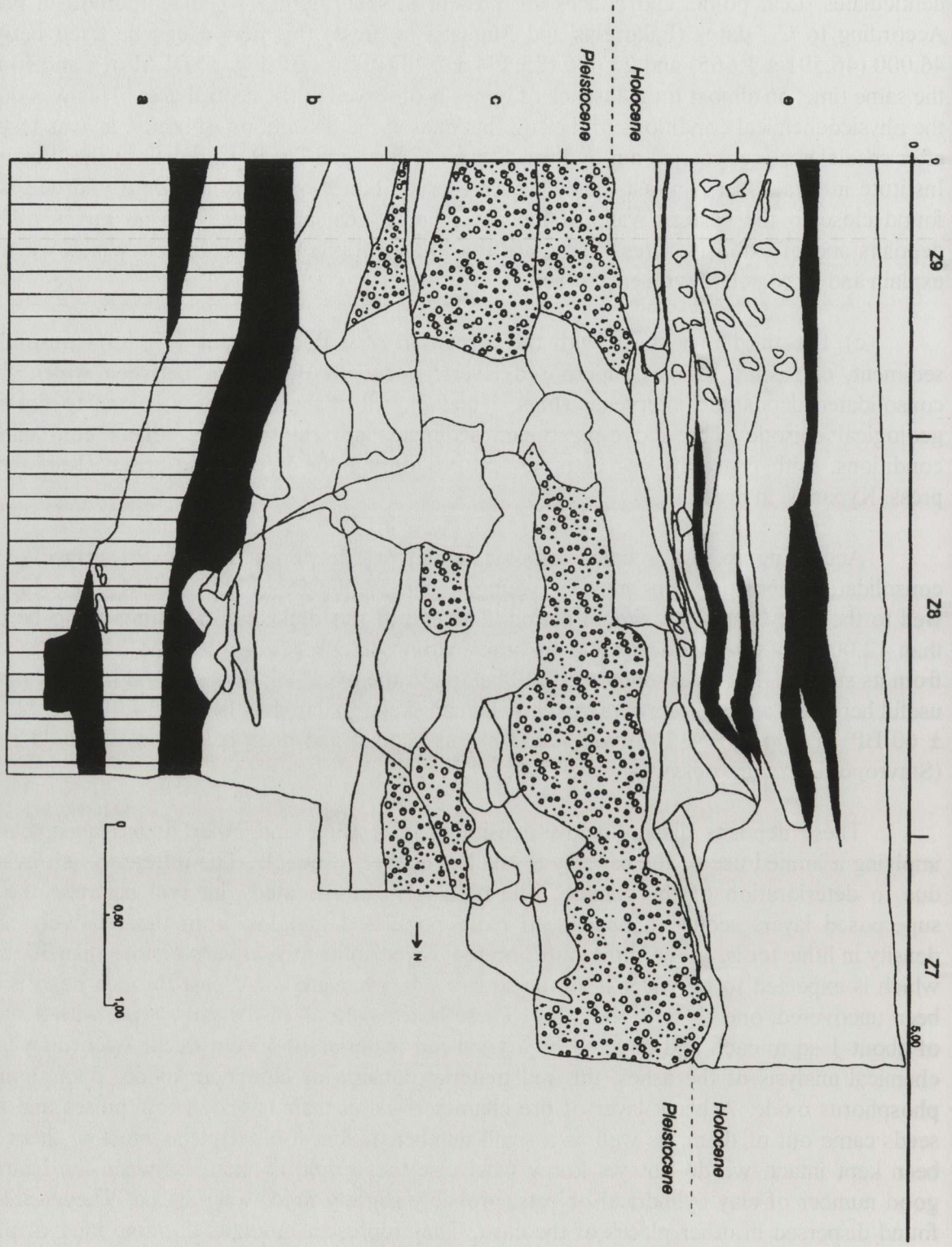

Fig. 3 Stratigraphy of the western wall of the trenches Z_7, Z_8, Z_9, where the units a, b, c and e are visible.

knowledge of the plasticity of this material, which was collected on purpose. During the Late Upper Palaeolithic, this clay material is usually found near fire remains, indicating knowledge of baking clay, while this is not the case in the earlier stages. A specially high concentration of lithic tools near the eastern sides of the cave during the Upper Palaeolithic is the most obvious proof of a "rich" Upper Palaeolithic phase in the cave, in a period of "ameliorated" climate, lasting the Last Glacial Maximum.

The Upper Palaeolithic assemblages, unlike the Middle Palaeolithic ones, show a much smaller tool/debitage ratio. The few cores are almost exclusively made of local chocolate flint. The presence of crested flakes and blades, core tablets and core maintenance pieces, in combination with the technological characteristics of blades and bladelets suggest systematic core exploitation and alternative use of hard and soft hammers. A variety of backed bladelets along with retouched blades, microgravette points, notches, truncations and endscrapers are among the tool inventory of Upper Palaeolithic industries of Theopetra. In general, these assemblages are comparable to those from Epirus. The raw material was introduced to the site in the form of river pebbles and nodules. The dominant flint type is the "chocolate" variety, abundant in Thessaly. Quartz is totally absent in the Upper Palaeolithic assemblage (Adam in press).

The archaeozoological material of the Palaeolithic layers contains the two species (*Ursus speleus* and deer) already mentioned, and is expected to be soon studied in detail. The archaeobotanical material is the oldest ever collected up to date in Greek excavations and contains a variety of wild fruits, nuts, seeds and vegetables including pea (*Pisum elatius*), almond (*Prunus cf. amygdalus*), clover (*Trifolium sp.*), elder (*Sambucus nigra*), black bindweed (*Bilderdykia convolvulus*), field gronwell (*Buglossoides arvensis*), viper's bugloss (*Carex sp.*, *Echiurn vulgare*), cleaver (*Gallium aparine*), yellow verchling (*Lathyrus aphaca*)[3]. It is very possible that the Palaeolithic people of Theopetra used a wider range of nuts and plants that did not manage to survive to the later periods.

d) 4th unit: The appearance of an intervening sandy layer (90 cm thick) between the Palaeolithic and the Neolithic (Fig. 4), with distinguishing characteristics not related to any of these two periods, sets the problem of the existence of the Mesolithic in the deposits of the cave. This layer, with characteristics of humidity and extensive use of fire in combination with use of clay locally, has not appeared under the Neolithic deposit in all the areas of the cave. It is localized partly near the entrance and partly in the periphery of the cave, being totally absent in the central area, where the thickest Neolithic deposits were found. The problem of its local appearance is not yet answered and this seems to be due rather to geological factors. But more important is to clarify the existence of this phase in Thessaly, which is very sparsely present in Greece and mainly in littoral sites. The study of its lithic industry (Adam in press) has shown that there is a large number of flakes, but no backed bladelets, no geometric microliths and no evidence for the practice of the microburin technique. From this study and its comparison with other Mesolithic industries of littoral sites in Greece, with some of which Theopetra seems to share common features, while with some others not, we expect answers concerning the character of the economy of this period in the area. The question is whether it actually kept

[3] Unpublished data of Maria Mangafa, IET Ephorate of Thessaloniki, who is studying the material.

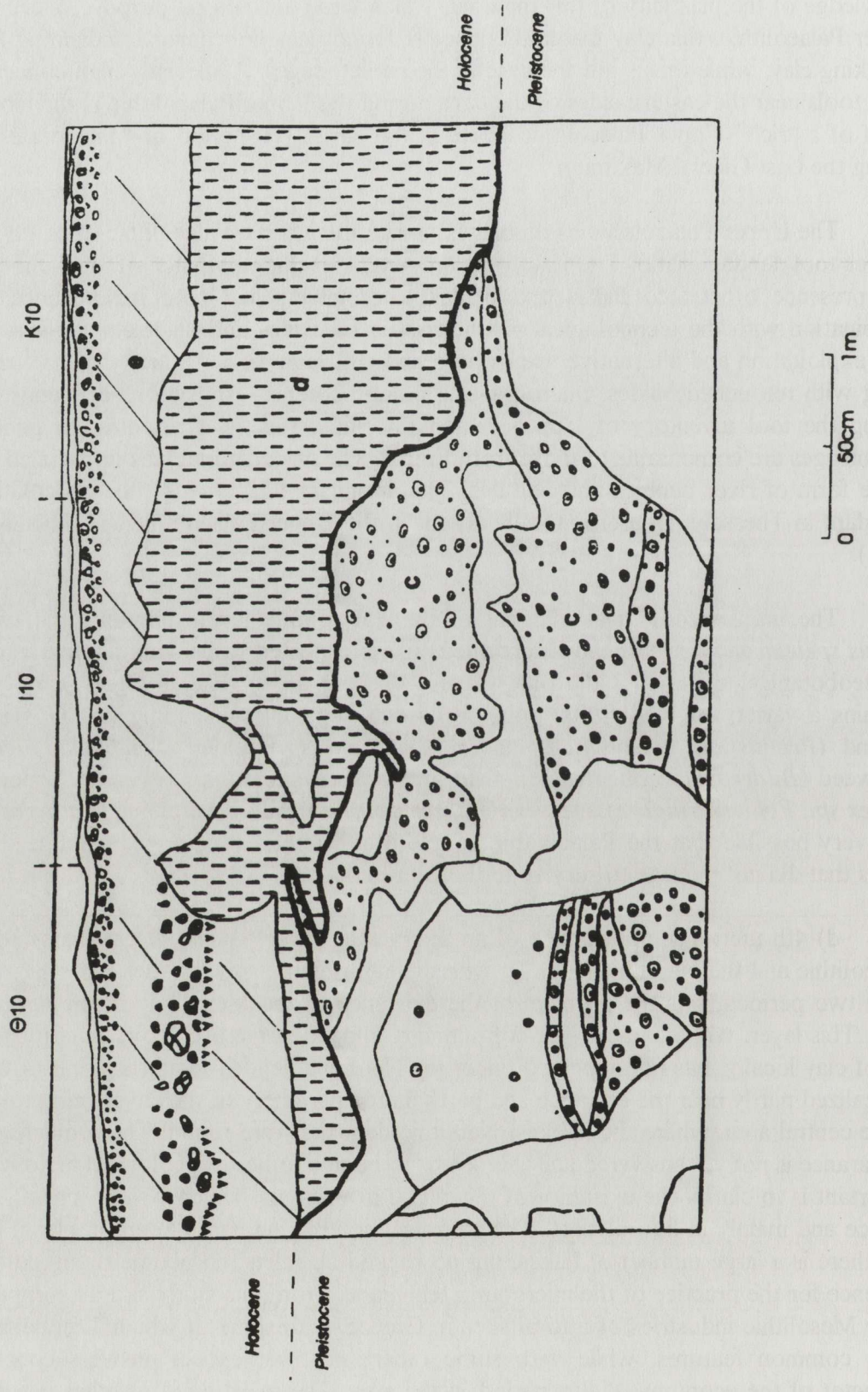

Fig. 4. Stratigraphy of the northern wall of the trenches θ_{10}, I_{10}, K_{10}, where the units b, c, d and e are visible.

Lab Code	Location	Depth	Age BP	Calibrated Age
DEM-315	H6/B	0,70m	9275 ± 75	8405 - 8138 BC
DEM-249	H7-H8	1,55 - 1,75m	10972 ± 87	11036 - 10843 BC
DEM-248	H7-H8	1,08 - 1,20m	11882 ± 86	12055 - 11758 BC
DEM-241	K10(NW)	1,45m	13723 ± 60	14620 - 14380 BC
DEM- 61	Z8	3,02 - 3,23m	25354±2132	
DEM-133	Z8-Z9	3,79 - 3,89m	39274±4771	
DEM-140	Z8	4,20m	39415±3914	
DEM- 613	È10	3,78 - 3,88m	46591±1665	

Fig. 5. Radiocarbon dated samples.

late Palaeolithic features, being in fact an Epipalaeolithic phase, or if it had clear Mesolithic features, as it is known from other European sites (Kozlowski 1990:95-108). Seven carbon samples taken out of this intervening layer have given dates that fall into the Mesolithic period (Fig. 5, DEM 360, 120, 125, 207, 315, 316, 142).

The lithic industry of this phase, which is more dense compared to the Upper Palaeolithic one, indicating a wider and more intensive use of the site (Adam in press), must be considered in relation to the locality, taking into consideration the different environmental conditions, not only of Europe and Anatolia but of the littoral Greek sites as well. A human burial of a young woman in flexed position found *in situ* in these layers is expected to contribute to our knowledge about the people who lived during this period in Greece. It was dated to 7.050-7.010 BC[4], while carbons of the filling of the burial were dated to 8.405-8.138 BC (Fig. 5, DEM 315). Several wild seeds and pulses already identified, such as wild lentil (*Lens sp.*), wild barley (*Vicia ervilia*), (*Hordeum sp.*), field gromwell (*Buglossoides arvensis*) and viper's bugloss (*Echinus Vulgaris*)[5], together with the archaeozoological material (wild goat, birds, carnivores, mice and possibly bovids and deer) will enrich our information about the natural environment of the site. On the other hand, attention has to be paid to the similarities of this phase with the so-called Aceramic Neolithic of Thessaly. Small masses of clay, as well as some "primitive" pieces of pottery, that were found in this layer, have to be very carefully examined and dated, in order to clarify if they belong to this deposit or if they have entered it by posterior geological procedures.

e) 5th unit: The Upper deposit belongs to the Neolithic period and it reaches 1.50-2.00 m in thickness, while near the entrance, and near the east walls of the cave it does not exceed 50 cm. It seems intact near the sides of the cave, but is seriously disturbed in the central area, where it is thick. This disturbance has possibly been caused partly by the continuous use of the cave by shepherds, as well as by rock-fall from the roof and by geological factors, such as water-flow. It is attested that in the past the surface of the deposit was about two meters over the present surface judging from sherds, bones and carbons attached to the side walls of the cave and such a big subsidence can be explained rather by geological factors than by the

[4] I am indebted to Professor Erle Nelson, Simon Frazer University, Canada, for this dating.
[5] Unpublished data of M. Mangafa.

posterior use by shepherds. This disturbed deposit contains all the Neolithic phases (Early-Middle-Late) as well as the Chalcolithic (Kyparissi in press b). Among the finds, which generally are the same as in open air excavated settlements in Thessaly, we must stress the presence of a large number of millstones, indicating long-period use of the cave, the important amount of table-offerings of the Middle Neolithic period, and the presence of some objects of Balkan origin, like a gold-ring-idol (only five gold-ring-idols are currently known in Greece), a human figurine of a style unknown in Greece, a stone pendant with zig-zag incisions and at least one bell-shaped lid of a vase. All these objects are estimated to be imported and indicative of a net system of exchange that took place among people over long distances during the Late Neolithic. The plants and the seeds identified, as well as the human and animal bones of this period, though mostly already known from previous research, will contribute to our knowledge of the character of this site during the Neolithic, with some possible additional features that differentiate it from the known Neolithic sites in Thessaly (Kyparissi in press b).

CONCLUSIONS

Summarizing the above, we should stress the significance of Theopetra cave in the following ten points:

1) The existence of all the successive periods from the Middle Palaeolithic to the end of Neolithic and Chalcolithic,
2) The transition from Pleistocene to Holocene,
3) The presence in its stratigraphy of the several alternations of climate that took place during the last thousand decades of the Pleistocene,
4) The earliest evidence for the use of fire in the area,
5) The unique presence of footprints in such an early period of Greek prehistory, giving us the chance to study the human type even without his skeletal remains.
6) The presence of two human skeletons, the one from Palaeolithic and the other from Mesolithic deposits,
7) The evolution of lithic technology during the millennia,
8) The evolutionary stages in the use of clay,
9) The presence of a long list of plants and seeds, the oldest ever found in Greek excavations,
10)The Neolithic use of the cave with possible exceptional character.

The cave of Theopetra, for the moment a unique site in the Greek archaeological record, can be compared with the cave sites of the Near East, the Balkans and Italy, not necessarily in terms of typical similarities of their stone industries, which have to be faced in the particularity of each area, but in terms of the evidence that brings together all these sites as belonging to the same human effort to investigate the earth and to earn the knowledge of a better life.

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