

## The Mesolithic/Neolithic Transition in Greece as Evidenced by the Data at Theopetra Cave in Thessaly

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**ABSTRACT** – *The Mesolithic period was sparsely documented in some littoral sites in Greece until 1992, when it was first testified in Theopetra Cave, western Thessaly, in central Greece. Excavation data in Theopetra indicate a very normal and natural transition from the Mesolithic to the Neolithic, which is documented by (a) the presence of unbaked masses of clay in the Mesolithic layers and a few atypical and monochrome sherds found at the same layers could show the very initial samples of pottery technology. (b) The presence of domesticated sheep and goat in the Mesolithic zoo-archaeological material, and a good percentage of wild fauna in the Neolithic deposit, indicating a rather similar way of life in both periods; (c) the presence of cultivated hulled six-row barley and of wild eincorn, both testifying farming as a local development and not as knowledge that came from the Near East to Greece. (d) The biological homogeneity which derives from the DNA analysis of human bones of successive periods.*

**IZVLEČEK** – *Vse do leta 1992 je bilo mezolitsko obdobje v Grčiji redko dokumentirano v nekaj obrežnih najdiščih. Takrat pa smo ga prvič dokazali v jami Theopetra, ki leži v zahodni Tesaliji v osrednji Grčiji. Izkopavanja v Theopetri kažejo, da je bil prehod iz mezolitika v neolitik zelo normalen in naraven. To dokazujejo: (a) navzočnost nepečenih kep glin v mezolitskih plasteh in nekaj netipičnih in enobarvnih črepih, ki smo jih našli v istih plasteh, bi lahko kazalo na prve začetke izdelovanja keramike; (b) navzočnost udomačene ovce in koze v mezolitskem zoo-arheološkem materialu in precejšen odstotek divje faune v neolitskih plasteh, kar kaže na dokaj podoben način življenja v obeh obdobjih; (c) navzočnost kultiviranega šestvrstnega ječmena in divjega eincorn žita, kar oboje priča, da se je kmetovanje razvilo lokalno in da znanje o tem v Grčijo ni prišlo iz bližnjega vzhoda. (d) Biološka homogenost, ki izhaja iz DNA analiz človeških kosti, iz naslednjih obdobj.*

**KEY WORDS** – *Theopetra, Thessaly, Mesolithic, transition to farming.*

### INTRODUCTION

The Mesolithic is the least investigated archaeological period in Greece. Two cave sites with Mesolithic finds (Zaimis and Ulbrich in Attica and the Peloponnese respectively) were excavated in 1920 by A. Markovits (1933), but until the 1950's the Neolithic was considered almost the back end of Prehistory in Greece, as the two above caves were never included in discussions concerning the Mesolithic in Greece (Galanidou *in press*).

After Milojević's Palaeolithic finds in the banks of the Peneios River in Thessaly in the same decade (Milojević *et al.* 1965), the demand for a Mesolithic background that would complete the prehistoric chain in Greece had become a permanent claim of the inves-

tigations that followed during the 60's and the 70's. The deepest Neolithic layers, where sparse sherds were found, were then named "aceramic" in the hope that these would lead to the even earlier period, the Mesolithic, which was expected to be found with the characteristics of a trapezoid and microlithic technique known already from Europe. At the same time (1964), a littoral Mesolithic site, Sidari, on the island of Corfu yielded indeed microlithic finds (Sordinas 1969). Then, in the 70's, at Franchthi Cave, near the eastern coast of the Peloponnese, one more site with a Mesolithic deposit was attested (Jacobsen 1976), and so the picture of the prehistoric record in Greece led to the view that the Mesolithic was entirely a marine story. Thessaly was, of course, exclu-



ded from the map of the Mesolithic (Perlès 1988; 1989; 1994; Runnels 1988; 1993).

When the Mesolithic was found in Theopetra Cave as an intermediate deposit between the end of the Palaeolithic and the beginning of the Neolithic, it was first confronted with scepticism by many scholars, as it suddenly overturned the theory that made Thessaly deserted at the beginning of the Holocene, a model that was reinforced by a recent survey of Thessaly in 1987 carried out by the American School of Classical Studies at Athens under C. Runnels (Runnels 1988), according to which caves were uninhabited during the Palaeolithic in Thessaly, and there was a gap of some 23 Kyr in the area before the Neolithic. The presence of the Mesolithic period in Theopetra confirmed the belief of some Greek prehistorians (Theocharis 1967; Kotsakis 1992), who had laid down the idea of inseparable continuity between the Pleistocene and Holocene in Greece.

I must say here that, after Theopetra, two or three more Mesolithic sites were found in Greece, one in a cave on the island of Yioura in Sporades (Sampson 1996a), one in a cave at the gorge of Klissoura in mainland Argolid, the east Peloponnese, not too far from the coast (Koumouzelis *et al.* 1996), while one more at the Cycladic island of Kythnos (Sampson 1996b) is faced as Mesolithic by the excavator without  $^{14}\text{C}$  dates yet. The Mesolithic in Yioura was found in sequence with the Neolithic but without Pala-

olithic background, while in Klissoura the Mesolithic consists the roof of the Pleistocene deposits. In Franchthi and in Theopetra the Mesolithic is found between the Upper Palaeolithic and the Neolithic, but in Theopetra additionally there is a more complete Pleistocene sequence including Middle Palaeolithic assemblages, being for the moment the only site in Greece with all this sequence of deposits (Kyparissi-Apostolika 1999a; 1999b; *in press*).

## THE CASE OF THEOPETRA

### Location of the site

The cave of Theopetra is located on the north side of a limestone formation on the right of the road leading from Trikala to Kalambaka (Prefecture of Trikala, west Thessaly) and 3 km outside the latter (Figs. 1, 2). Its altitude is about 60 m above the plain and 300 m above the sea level. It lies between the edge of the Thessalian plain and the foothills of the east Pindus Mountains, being the natural border between Thessaly and Epirus. It has a roughly quadrilateral shape and measures somewhat less than 500 m<sup>2</sup>. The entrance is large (17 x 3 m) and arched, oriented towards to the Byzantine monasteries of Meteora in Kalambaka. It is the westernmost prehistoric settlement of Thessaly (Papathanassopoulos 1996, Map 9, No. 406).

### The excavation data

The Mesolithic deposit in Theopetra is recognised as a distinct yellowish-brown (Munsell 10YR 3/4-4/4) humid sediment, interrupted partly by fire remains, and it possibly reflects a rather humid climate. This deposit was not found in all the area of the cave and was absent from the central area, where large-scale erosion took place due to the invasion of large volumes of water from carstic aquifers which repeatedly filled the cave, eroding a huge amount of the autochthonous sediment. The above described yellowish-brown sediment lies at the surface of a consolidated sediment reflecting the last glaciation, and contains the end of the Palaeolithic after the last glaciation at its deepest deposition, and the Mesolithic at the rest, that is to say,

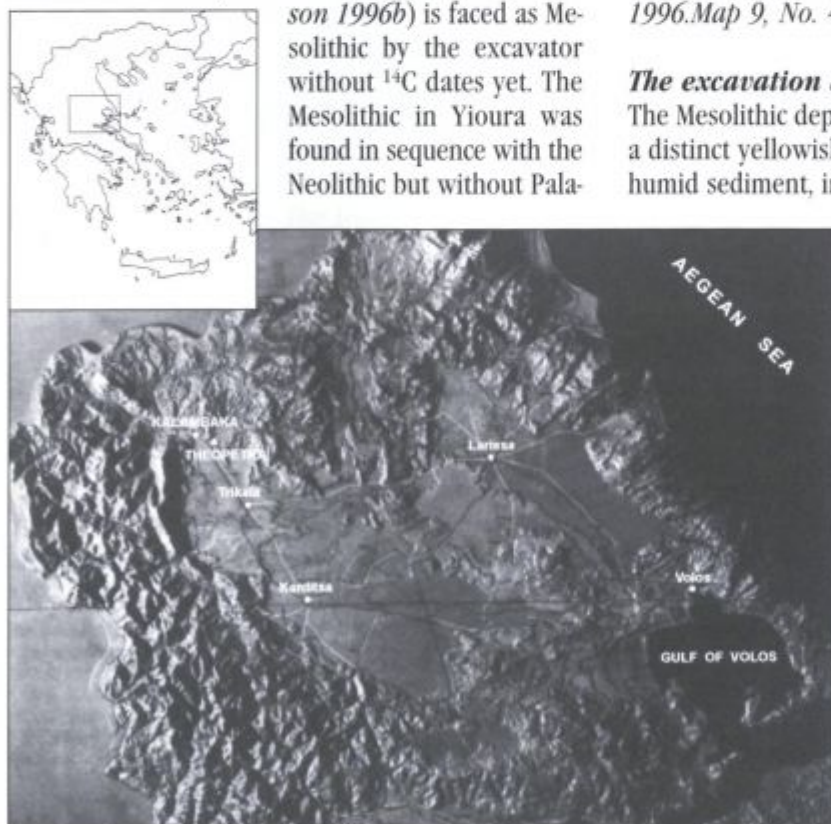


Fig. 1. Relief map of Thessaly with the site of Theopetra indicated.



the end of the Pleistocene and the beginning of the Holocene<sup>1</sup>. At first glance, this sediment seems homogeneous, reflecting a normal climatic sequence. However, it was interrupted by a harsh climatic episode, the so-called younger *Dryas*, which affected a burnt layer dated to 11 500 BP. After this episode, the Mesolithic in Theopetra begins (Karkanas 2000; Karkanas *in press*).

A good number of <sup>14</sup>C dates so far fall into the Mesolithic period, with the oldest boundary touching the 9721 ± 390 BP (DEM 142) and the youngest the 7995 ± 73 BP (DEM 360) (9940–8550/7060–6780 BC) (Fig. 3), covering about 1700–2000 years (Faccarelis and Maniatis *in press*).

Among them there is the date of a Mesolithic skeleton dated from the bones to 8070 ± 60BP (7050–7010 BC) (CAMS 21773, Fig. 3) being a clear Upper Mesolithic date. The skeleton belongs to a young woman, 18–20 years old, buried in a semiflexed position in a shallow pit (Fig. 4). The head looked straight in front and was at a higher level than the body, which was turned to the right of the dead, looking at the entrance of the cave. No morphological indications of pathological alterations were found macroscopically, while from the cranial radiography arose mild porotic hyperostosis, possibly as a result of iron depletion, but no acute anaemia, which could lead to death. The dental examination shows a healthy individual (Stravopodi *et al.* 1999). Four flint implements were found beside the skeleton, but it is difficult to assess whether they were intentionally placed with the body or were coincidentally part of the infill of the pit. Charcoal selected from the immediate vicinity of the skeleton gave two <sup>14</sup>C dates, 9274 ± 75 and 9348 ± 84 BP (8610–8340 and 8740–8470 BC) (DEM 315,316), while the dating of the bones already mentioned puts the buried individual about 13 centuries later, so the selected charcoal obviously belongs to the infill of the pit, which was dug into an older Mesolithic deposit. The finds of the Mesolithic deposit in Theopetra (lithic industry, bones, carbon) are dense compared to those from the last glaciation deposit, but sparse compared to the overlying Neolithic finds.

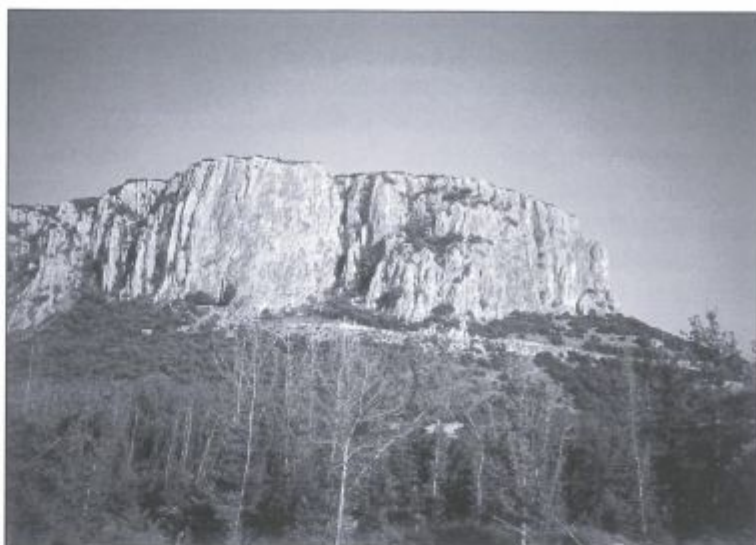


Fig. 2. View of the limestone balk where the cave of Theopetra is found.

The lithic industry relied heavily on the locally available radiolarite, while local materials were also employed. There are large numbers of flakes, retouched forms including truncations, notches and flakes with alternate retouch, but no bladelets, no backed bladelets, no geometric microliths and possibly no practice of the microburin technique (Adam 1999). It must be stressed here that the analysis of the Mesolithic industry is in progress, the case though doesn't seem to be that of a typical Mesolithic one as it is known from Europe. It appears to be closer to the lithic phase VII of Franchthi (Perlès 1990; 1999), showing dissimilarities from phase VIII (the reappearance of backed and truncated elements) (Adam 1999).

From the study of the Neolithic industry (Skourtopoulou *in press*) there arises a clear continuity with the Mesolithic: (a) in the use of the same raw material, chocolate thessalic radiolarian flint, its sources found in the Pindus Mountains or as a secondary material (pebbles) found in alluvial deposits; (b) in the technology of the implements – the Neolithic is to a high degree a flake industry, as is the Mesolithic, and the cores show similarities. The technological continuity is also observed in the types of implements (a high percentage of notches and denticulates worked in flakes in dimensions bigger than the usual). Despite the aforementioned disturbance and erosion of the deposit in Theopetra, which does not allow any observations that derive usually from normal stratigraphy, it is obvious that elements known

<sup>1</sup> In Theopetra and in the neighbouring Pindus Mountains is the southernmost point of Europe where the last glaciation is attested with characteristics of such severe climatic conditions (Bailey and Gamble 1991; Karkanas 2000).



Lab code	Pit	Depth	Age (yr BP)	Calendar age	Standard deviation
DEM-918	A8, Pass 4, Brown layer	0.24–0.37 m	7901±29	6818–6663 BC 7028–6649 BC	1σ 2σ
DEM-360	H6, Pass 10, Layer B	1.15–1.23 m	7995±73	7060–6780 BC 7080–6660 BC	1σ 2σ
DEM-583	I11, Pass 3, Western region Neolithic- Mesolithic boundary	0.57 m	8014±49	7060–6829 BC 7073–6706 BC	1σ 2σ
DEM-576	I11, Pass 3 Neolithic- Mesolithic boundary	0.77 m	8060±32	7078–6866 BC 7137–6829 BC	1σ 2σ
CAMS-21733	H6, Human skeleton, burial in situ	0.30 m	8070±60	7180–6830 BC 7300–6770 BC	1σ 2σ
DEM-120	I10 Eastern region	1.04–1.17 m	8524±57	7590–7540 BC 7650–7480 BC	1σ 2σ
DEM-578	I11, Pass 8, South-eastern region	1.37 m	8547±71	7650–7520 BC 7750–7480 BC	1σ 2σ
DEM-587	I11, Layer 1, Central region	0.60–0.71 m	8558±37	7599–7549 BC 7641–7529 BC	1σ 2σ
DEM-125	I10, Western region	1.56 m	8673±76	7780–7590 BC 7950–7580 BC	1σ 2σ
DEM-589	I11, Pass 6	1.18 m	8863±119	8210–7830 BC 8270–7650 BC	1σ 2σ
DEM-207	I9	2.13 m	9093±550	9120–7590 BC 10 130–6820 BC	1σ 2σ
DEM-590	I11, Pass 7	1.27 m	9150±112	8530–8270 BC 8720–7970 BC	1σ 2σ
DEM-586	I11, Layer 2	0.80 m	9188±86	8520–8290 BC 8620–8250 BC	1σ 2σ
DEM-315	H6, Layer B, On human skeleton	0.73 m	9274±75	8610–8340 BC 8720–8290 BC	1σ 2σ
DEM-316	H6, Layer B, On human skeleton	0.73 m	9348±84	8740–8470 BC 9090–8300 BC	1σ 2σ
DEM-577	I11	1.37 m	9370±93	8780–8470 BC 9110–8300 BC	1σ 2σ
DEM-588	I11	1.23 m	9461±129	9120–8610 BC 9220–8350 BC	1σ 2σ
DEM-142	I10, Eastern region	1.17 m	9721±390	9940–8550 BC 10 690–8210 BC	1σ 2σ

**Fig. 3. List of radiocarbon dates concerning the Mesolithic and the Mesolithic/Neolithic transition.**

from earlier industries are present in the Neolithic material in general.

One of the most important finds of the Mesolithic deposit in Theopetra is the presence of some unbaked clay masses, as well as of some monochrome atypical sherds within them. Their technological characteristics (the shaping and finishing of the surface) are primitive compared to the Early Neolithic examples, while in some cases they are slightly baked. At the beginning, we regarded as intrusive from the overlying Neolithic deposit, but as they continued to be found down to 45 cm below the Neolithic deposit, in parallel with unbaked masses of clay, and

given the fact that the chromatic and component sedimentation of the Mesolithic deposit is absolutely distinct from that of the Neolithic, any intrusion from the one deposit to the other could be safely perceptible. My assessment is that they represent a very early pottery at the boundary of the Mesolithic/Neolithic transition (*Kyparissi-Apostolika in press*). Additionally, the presence in the Neolithic deposit of pottery characterized in the bibliography (*Theocharis 1967:127–143*) as “primitive painted pottery” belonging to the initial Early Neolithic before Sesklo, reinforces the possibility that we have here the very beginning of pottery technology in Greece. TL dating would clarify the period to which these sherds



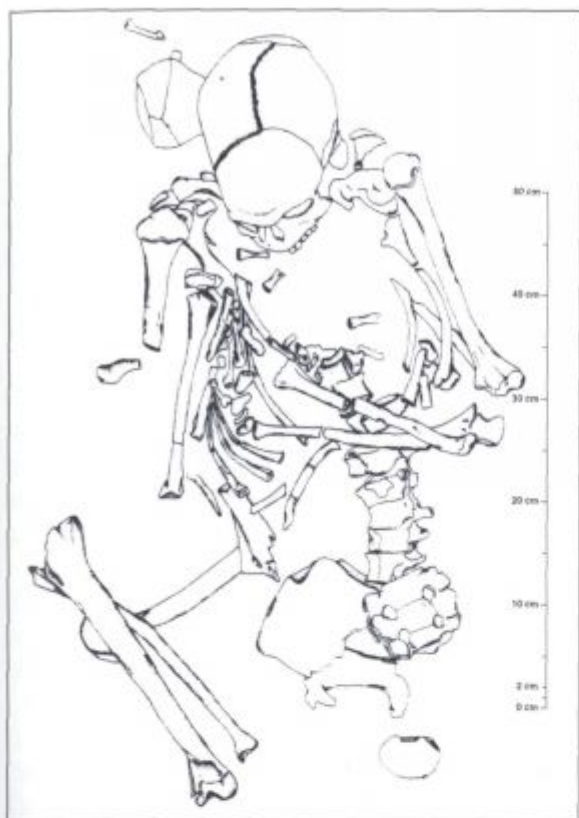


Fig. 4. Sketch of the Mesolithic burial found in Theopetra (drawn by M. Deilaki).

belong. The presence of unbaked clay is also noticed in the late Upper Palaeolithic deposits of Theopetra, while some cylindrical clay objects up to 7–8 cm long and 2–3 cm thick are also observed in the same layers, coming though from Mesolithic layers which eroded the Palaeolithic ones (Kyparissi-Apostolika 1999 *in press* and Karkanas *in press*). The presence of clay, either in unbaked condition or as sherds, is referred to also from other Pre-Neolithic sites in Greece (Theocharis 1958; Perlès 1999; Vitelli 1993) and in Europe (Bahn 1978; Vandiver *et al.* 1990), and so the beginning of pottery technology must be re-examined for its starting boundaries.

The archaeo-botanical material of Theopetra cave, the oldest ever recovered from excavations in Greece, plays a key role in the study of the Mesolithic, as well as in arguments concerning the Neolithization of Greece. The presence of cultivated *Hordeum vulgare* ssp. *exastichum* (hulled six-row barley) and of *Triticum boeoticum* (wild einkorn), as well as of some wild legumes such as *Lens* sp. (lentil), *Vicia ervilia* and so on in the Mesolithic material of Theopetra is definite proof that farming must have started here. The same plants are found as cultivated species in the Neolithic material among other kinds of crops and fruits. The absence of the above plants from the

Greek data in the past was one of the strongest arguments in the discussion that sought to regard farming as the result of Near Eastern population movements. Of course, we would not deny that people who were familiar with farming could have come from the Near East and possibly spread this knowledge to some population on Greek territory as well, but this territory, after Theopetra's finds, does not seem to be Thessaly.

According to palynological investigations (Bottema 1979), at the beginning of the Mesolithic the steppe vegetation was replaced by forest vegetation. This fits with the finds of the anthracological analysis in Theopetra (Ntinou *in press*) (the palynological analysis is not ready to give information yet), according to which deciduous species like *Ulmus* sp., *Prunus* sp., *Quercus* and *Fraxinus* sp. are present in the Mesolithic material, probably related to the development of forests in the early Holocene.

The picture fits also with the fauna species present in the Mesolithic of Theopetra, which are woodland species (wild boar and wild cat – *Felis sylvestris*) (Rowley-Conwy and Newton *in press*). The large carnivores that were present in the Palaeolithic strata disappear in the Mesolithic. The Mesolithic assemblage, however, is dominated up to 40% by small ovi-caprids, indistinguishable from domesticated sheep and goat, and it is possible that early Holocene hunter-gatherers acquired domesticated ovi-caprids from neighbouring groups with herd animals (Newton *in press* and *forthcoming*). The same question arises with the fauna of the Mesolithic strata in Yioura Cave, where ovi-caprids also seem to be domesticated (Trantalidou *in press*). A rather high percentage, around 11% of the Neolithic material in Theopetra belongs to the wild fauna, and some of the species (wild cat, red deer, wild boar and hare) feature also in the Mesolithic. This perhaps indicates a certain continuity of habitat type between the two periods. From the domesticated fauna of the Neolithic material, over 70% are ovicaprids, of which 70% are sheep, while pig and bovids are present with 8% each (Hamilakis *in press*).

Last, but not least, I would like to emphasize the biological homogeneity which derives from the DNA analysis of the Palaeolithic, Mesolithic and Neolithic human bones of Theopetra, and hence the possibility that the genetic gradient in Europe may not have originated from the Near East with the spread of farming, but may have been in place as early as the Upper Palaeolithic at least (Evison *et al. in press*).



## CONCLUSION

Theopetra Cave, at the western end of the Thessalian plain and equidistant from the Pindus Mountains and the plain, is a hidden site not accidentally perceptible by travelers, as could be maintained for littoral cave-sites like Franchthi or the cave of Cyclope in Yioura. Hence, the hypothesis that it could be used for a while and then be abandoned for some thousand years and again be found by chance later and so on, in my opinion, must be excluded. Within this perspective, it is likely possible that once it was discovered, it was used by the same population and their descendants, who either used it as a permanent base or periodically, the kind of use changing according to the reasons that ruled the one or the other way.

As no vegetation changes that could reflect climatic changes are referred to in the palynological investigations (Bottema 1979) for the end of the Mesolithic and the beginning of the Neolithic, the transition from the one period to the other should be seen (a) in the establishment of pottery technology, (b) in farming knowledge, (c) in the faunal and floral sequence and, (d) in the biological continuity or discontinuity of the population.

As we have seen from the data of Theopetra Cave, all the above parameters lead to the hypothesis that they are the result of long-term attempts starting from the Palaeolithic onwards, and not knowledge that was taught to the population of Thessaly by people from the Near East. If we did yet not have proofs that Thessaly was populated before the Neo-

lithic, as was estimated in previous decades, the model of exogenous new experience would work well. However, with the new data from Theopetra Cave it would be beyond any common sense to accept that the Palaeolithic and the Mesolithic people who lived in Theopetra Cave and exploited the environment for their survival had not observed nature and the properties which plants and soil and all other natural elements have, namely the same observations that led the population of the Near East to knowledge of farming. And it is possible that this is why, in western Thessaly (where Theopetra is located), there are the oldest Early Neolithic settlements, such as Prodromos and Magoulitsa (Chourmouziadis 1971; 1972; Papadopoulou 1958, respectively), while during later periods they spread to eastern Thessaly, closer to the coasts of the Aegean (i.e. Dimini, Pevkakia) (Halstead 1980). These first settlements were probably established by the descendants of Theopetra's population, and some of these people continued to live in Theopetra during the Neolithic also.

In my opinion, the poor presence of the Mesolithic in the Greek peninsula is the result of wrongly directed research, as it has been oriented to European and Anatolian models for the settlement pattern and the lithic industry typology. It is now time to turn to different models harmonised to the Greek environmental and climatic conditions of that period, which, I believe, will lead us to more Mesolithic installations. I believe that further research on the material of Theopetra, as well as new excavations that will follow, will prove definitively a model of indigenous Neolithic civilisation in Thessaly, a picture that derives from the excavation in Theopetra Cave.

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