SARAKENOS CAVE IN BOEOTIA, FROM PALAEOLITHIC TO THE EARLY BRONZE AGE

Adamantios Sampson¹, Janusz K. Kozłowski², Małgorzata Kaczanowska³, Anna Budek⁴, Adam Nadachowski⁵,⁶, Teresa Tomek⁶ and Barbara Miękina⁶

¹ Aegean University Rhodes, Department of Mediterranean Archaeology, Demokratios Ave, Rhodes, Greece
² Institute of Archaeology, Jagiellonian University, ul. Golębia 11, 31-007 Kraków, Poland, janusz.kozlowski@uj.edu.pl
³ Archæological Museum, ul. Senacka 3, Kraków, Poland
⁴ Institute of Geography and Spatial Organization, Polish Academy of Science, ul. Św. Jana 22, 31-016 Kraków, Poland
⁵ Departament of Palaeozoology, Zoological Institute, Wrocław University, Sienkiewicza 21, 50-355 Wrocław, Poland
⁶ Institute of Systematics and Evolution of Animals, Polish Academy of Sciences, ul. Sławkowska 17, 31-016 Kraków, Poland

Abstract

Sarakenos Cave, occupied since the Late Palaeolithic, is of crucial importance for the study of the Mesolithic/Neolithic interface. There is a striking contrast between the isolated Mesolithic, particularly Late Mesolithic occupations with flake technology adapted to the local bad quality raw materials, and with subsistence economy based on fowling and plant gathering, also adapted to the local environmental conditions, and the Early Neolithic groups arriving some 120–140 radiocarbon years later, with imported raw materials, macroblade technology and animal breeding. The Middle and Late Neolithic occupations are represented by numerous symbolic objects such as figurines indicating the important role of the cave in ritual activities.

INTRODUCTION

In 1993 in the Kopais area in Boeotia (Fig. 1) we started up a project with the aim to systematically survey the karstic formations all around the rocky boundaries of the basin (Sampson, 2000, 2004, 2006). During this project we have located, recorded, and mapped a large number of caves and rock shelters in the basin. The larger concentration of caves is observed in the limestone boundaries of the eastern part of Kopais (Fig. 2). In the area between Akraifnion and Aliartos we have explored and mapped 23 caves, most of which are of a low elevation at the level of what once was the lake coast. In some rock shelters a few surface chipped flints have been found probably of Palaeolithic age and five Neolithic settlements have been located in the eastern part of the valley.

Because of its importance as a natural karstic basin, Kopais has been the subject of extensive palaeoenvironmental studies since the 1970s. Greig and Turner (1974, 1975) published detailed pollen diagrams and Allen (1997) offered information on the vegetation from the Late Upper Palaeolithic onwards from two new cores.

During the Late Upper Palaeolithic, Kopais featured a vegetation pattern typical of an open steppe and a dry and cold climate (Artemisia, Graminae and Chenopods). The Pleistocene – Holocene transition is recorded in the diagrams in the form of forest expansion (Quercus, Juniperus, Pistacia, Ephedra), while layers that correspond
to 4000–3000 BC Quercus drop, possibly due to deforestation. The analysis of the grain of the coring samples suggests that there was fluctuation in the lake levels during the Late Pleistocene and Early Holocene. There are also indications that the lake level dropped after 4000 and until 2500 BC.

The palynological material that has been studied from the Sarakenos Cave sediments (Sampson and Ioakeim 2002) shows presence of Pine and Quercus and an increase of Leguminosae during the transition from Late Neolithic I to LN II (second half of the 5th mill. BC). The same species are present with small fluctuations during the Late Neolithic II and the EH II. Generally, from the second half of the 5th mill. and until the 2nd mill. BC the plant species recorded in the cave pollen diagrams show the clear impact of humans on the Kopais basin environment.

EXCAVATION AND STRATIGRAPHY

The most suitable cave for excavation was the cave of Sarakenos (Fig. 3), which was located in the eastern part of the former lake of Kopais at the altitude of 180m. It is the largest karstic formation in the area, found today much higher than the level of the plain. The cave has a large entrance, 25 m. wide (Fig. 4), which lightens the chamber and gives an excellent view to what was once the lake. Archaeological research in Sarakenos Cave begun in the early 1970’s by Spyropoulos (1970), and had featured finds from different chronological periods; the publication of this material, however, was never to be realised.

Fig. 1. Map of the Kopais area
Fig. 2. Caves in the eastern part of Kopais
The systematic excavation of the site was part of the Kopais Project that started in 1994 in order to establish a chronological sequence for the development of the cave and the identification of economical models in diverse periods. The research was continued since 2000, while since 2004 a new period of excavations started in the cave that is continues till now.

Exceptional stratigraphical data inside the cave has led to the succession of distinct cultural phases, dated from the Middle/Upper Palaeolithic to the Middle Helladic (2nd mill B.C.), when the cave was abandoned for reasons yet unknown (Sampson 2000). Probably, the drainage of the lake, which was carried out probably towards the end of the Middle Helladic period, was the reason for the abandonment of the cave.

**Trench A**

Trench A was opened along the side of the cave’s area that was investigated in the past and next to the southern wall of the cave. Trench A presents a stratigraphic sequence close to that from nearby Trench C (Fig. 5). The spits 3 and 4 belong to a clear MH stratum, exceptionally clear due to the particularly thick layers of burning. The Middle Helladic stratum in Layers A3–A5 corresponds to the spits C5–C8. The thin Early Helladic stratum in Layer A5 corresponds to Layer C9,
which gave an absolute date (DEM-1139, 3859±26 BP or 2400–2210 BC).

At spit 6 the last stage of the Late Neolithic (ca. 3800–3300 BC) started, while the successive spit 7 offered an absolute dating (DEM-672, 4895±31 BP or 3697–3650 BC). Though relatively thin, the stratum of this phase contained abundant pottery specimens, characteristic of this period. The final Neolithic phase in Trench A (LNIIb) corresponds to spit 10 of the adjacent Trench C.

From spit 8, which belongs to the Late Neolithic IIa phase (ca. 4300–3800 BC), came an absolute dating (DEM-1065, 5407±22 BP or 4330–4250 BC) that is characteristic of this phase’s start. Spit 9 corresponded to spit 12 of Trench C and dates from the Late Neolithic Ib (ca. 4800–4300 BC), a phase noted in most caves in Greece with a long duration (Tharrounia – Sampson, 1993; Cyclops Cave – Sampson 1998; 2008). Two absolute ages (DEM-1140, 5671±20 BP or 4520–4460 BC and DEM-815, 5874±22 BP or 4776–4714 BC) from Trench A and C are inside the ordinary chronological limits of the Late Neolithic Ib. A sample from spit C13 gave an absolute dating (DEM-1141, 5931±25 BP or 4840–4730 BC) at the limit between the Late Neolithic Ia and Late Neolithic Ib phases.

Spits 10 and 11 in Trench A belong to the Late Neolithic Ia phase (ca. 5300–4800 BC). An absolute dating of fine precision came from spit A10 (DEM-1064, 6096±24 BP or 5040–4960 BC). Spit A11 also dates from the late stage of the Late Neolithic Ia and lead to three dates that coincided with the late stage of the Late Neolithic Ia phase (DEM-1061, 6117±55 BP or 5210–4860 BC, DEM-1062, 6081±33 BP or 5040–4860 BC, and DEM-1063, 6062±29 BP or 5000–4860 BC).

A floor was unearthed at a depth of 2.25 m (Spits A12, A13) that extended into Trench C and
dated from the beginning of the Late Neolithic Ia phase. It consisted of hard earth, beaten soil, and ashes and terra rossa, while it preserved five openings from postholes probably, possibly related to some sort of partition at this point of the cave. The extensive floor with the postholes appears to have been in use for a long period of time due to the significant thickness.

Spits 14, 15 and 16 feature pottery types of the Middle Neolithic period, while a small number of LNIa matt-painted and black burnished wares continued to appear. A sample from spit 14 led to an age fixed as DEM-1138, 6125±42 BP or 5200–4960 BC.

Pure MN strata appeared from the level of spit 17 onward, which featured a charcoal sample of an age fixed as DEM-1137, 6722±20 BP or 5660–5570 BC. Spit 18 also featured an absolute dating (DEM-1136, 6618±22 BP or 5610–5520 BC. In spit 19 MN finds were very scarce and the absolute dating showed considerable chronological difference from the previous layer (DEM-1118, 6794±21 BP or 5710–5650 BC). Spit A21 featured a similar dating (DEM-1117, 6779±42 BP or 5710–5640 BC). Sparse MN finds around the hearth continued to occur up to spit 23 (330 cm) in clayish layer with limestone éboulis. This layer corresponds to the MN/EN boundary.

**Trench A – Extension**

Trench A was extended in order to study in more detail the layers of Mesolithic and Early Neolithic, as well as the transition from the for-
mer to the latter. Squares 5, 6, and 9 were excavated. The sequence of layers below spit 23 (330 cm) consisted of the following lithostratigraphic units (Fig. 6).

**Unit 1** – a layer of dark brown clay with *eboulis* containing stalactite fragments, carbonate cemented. Up to the depth of 360 cm the layer contained rare fragments of painted pottery (white-on-red, red-on-grey, black) and unpainted sherds with smooth red or black surface. Single charcoals of deciduous trees and rodent remains also occurred.

**Unit 2** – a layer of light brown clays with a small quantity of angular *eboulis* was seen from a depth of 360 to 410–430 cm. The unit contained rare fragments of painted pottery (white-on-red, red-on-grey, black) and unpainted sherds with smooth red or black surface. Single charcoals of deciduous trees and rodent remains also occurred.

The AMS dates obtained: the middle portion (380–390 cm) gave the date of 7460±50 BP (6430–6220 BC) (Poz-9842); the lower portion (400–410 cm) – the date (square 11) of 7560±50 BP (6470–6450 BC) (Poz-9843) and, at the border of units 2 and 3 the date 7680±40 BP (6600–6450 BC) (Poz-22182). Unit 2 yielded bones of domesticated animals, namely sheep/goat (*Ovis/ Capra* sp.). 55 bone fragments match the size of sheep and goat and probably belong to these species. The skeletal remains were: 5 teeth, 1 vertebra, 5 rib fragments, 1 carpal bone (lunatum), 2 ulnae, 2 radius, 1 pelvis fragment, 1 femur, 1 calcaneus, 1 talus, 3 metatarsals and 1 phalanx. A cut mark can be seen on a fragment of a limb bone (probably radius); small bone fragment (1 cm length) shows traces of burning and another of gnaw marks of small carnivore (fox or small dog). Remains of other faunal species in unit 2 are very rare, and belong to birds (rock partridge –
Alectoris graeca, rock pigeon – Columba livia and jackdaw – Corvus monedula). These birds are known also from the pre-Neolithic layers of the cave, and represent rocky environments.

In between unit 2 and 4 there is a weakly developed clayey sediment, reddish in colour, with rare eboulis, defined as unit 3. In the West profile unit 3 is several cm thick, whereas in the North and the East profiles its thickness is up to 30 cm. The excavation of squares 2 and 3 in the northern part of trench A in the year 2008 allowed to determine the contents and structure of unit 3: on one level in the centre of a reddish layer 3 flat hearts up to 50 cm in diameter were discovered. One of the hearth is located next to a large limestone block at the boundary of squares 2 and 3. The culture materials from the upper portion of unit 3 (excavations in 2008 including) consisted only of about 10 stone artefacts namely: 2 initial macroblade cores from dolomitized limestone pebbles, single platform flake core from sandstone (lateral preparation of the back), a trapeze on an obsidian macroblade, and flakes from limestone and brown radiolarite. Moreover, two sherd were found: a fragment of the rim of an everted bowl from brown clay with mineral temper, well smoothed and fragment of the belly of a spherical thin-walled vessel with cream colored surface and with mineral temper. The level with the hearths in unit 3 provided the following radiocarbon AMS

Fig. 7. Finds from EN Monochrome phase layers (unit 2): 1 – sickle blade from the yellow flint, 2, 3 – intentionally truncated obsidian blades, 4–8 – monochrome pottery
dates: 7780±50 BP (6690–6500 BC) (Poz-22647); 7740±50 BP (6650–6470 BC) (Poz-27941) and 7810±50 BP (6780–6500 BC) (Poz-27242). This dates are older from the earliest dates for unit 2 (7680 BP) and – at the same time – later than the final dates for unit 4 (7950–7960 BP). The presence of monochrome ceramics, the macroblade technique and Melean obsidian indicate that unit 3 (at least its middle and upper portion) correspond to the earliest Neolithic settlement on the Sarakenos Cave. The fauna from unit 3 (faunal remains from the excavations in 2007 only were identified) is represented by only a few bird bones (common quail – Coturnix coturnix, rock pigeon – Columba livia, corn bunting – Emberiza calandra and starling – Sturnus sp. cf. vulgaris and red-billed chough – Pyrrhocorax pyrrhocorax).

Unit 4 is composed of dark brown almost black clays with a highest content of loamy fraction and organic matter. Towards the floor this layer passes into brown and reddish clays, sandier, with a small component of organic fraction. This unit was registered at a depth of 410/430 cm and 500 cm. Micromorphological examinations (Bullock et al., 1986, Stoops, 2003) showed that the top portion of this dark brown clays (samples MS1 and MS2 on the profile – Figs 8, 9) contained a large amount of unsorted plant remains: roots, stalks and leaves, within silty material with quartz grains. The presence of the plant remains is of anthropogenic origin and the groundmass is anthropogenically reworked. In groundmass fragmented shells with secondary calcium carbonates are recognizable. The grains of minerals are unweathered. In separated aggregates typical iron
nodules occur. Illuviation processes are weakly marked as initial clay coatings; fragmented clay coatings occur also in cracks forming structures similar to papules (Kemp, 1991) arising in freezing conditions. Strong anthropization of this unit contrasts with the presence of rare artifacts: only one obsidian bladelet has been found in it. On the other hand, the upper portion of unit 4 contained limestone pebbles with scars shaping flake cores, mainly discoidal, and limestone flakes (Fig. 10). Initially these artifacts may have been overlooked in the mass of limestone rubble in the cave. Thus, the presence of scars on the limestone pebbles that were brought from the exterior of the cave, from the alluvial at the foot of the slope, is an argument in support of the intentional nature of these specimens. Only one radiolarite bladelet (Fig. 10: 5) and one partially cortical small flake from black hornstone (Fig. 10: 4) were found in the uppermost part of unit 4.

Unit 4 featured relatively abundant remains from small mammals and birds (Table 1). Bird remains (63 identified fragments) mainly represent species connected with open and dry environments and/or rocky areas. It is highly probable that most of these species nested on the cliffs, in rock crevices or on ledges around the entrance of the cave. Only 3 species required other breeding environments: the Pochards (Aythyini) – open water bodies, the Corn Bunting ( Emberiza calandra) and the Hawfinch ( Coccothraustes coccothraustes) – woods and shrubs. Some of these species appeared in units 2 and 3. The most abundant is the pigeon (60% of remains) probable dweller of

Fig. 9. Micromorphological features of unit 4, sample MS 2 (see Fig. 6)
rocks in the vicinity of the cave, represented by young and very young specimens. This species must have been particularly attractive to the human inhabitants of the cave during the sedimentation of unit 4, because some burnt bones with ash were recorded inside the cave.

Unit 4 featured small mammals, namely rodents and insectivores (36 identified fragments). Rodents are represented almost exclusively by grassland and open country dwellers. The Guenther’s vole (*Microtus guentheri*) is an endemic species restricted to Anatolia and the south-east-

Fig. 10. Limestone and sandstone artifacts from the top of unit 4
ern Balkans. It is found in dry areas, meadows, pastures with sparse vegetation on well-drained soils. Remnants of mouse (Mus sp.) are unidentifiable on the species level, but probably represent south-eastern Balkan or Mediterranean species.

Charcoals from the top of unit 4 contain predominantly oak (Quercus robur and Quercus pubescens) and Prunus (identification by B.de Larebeyrette). All these data confirm that the sedimentation of unit 4 took place in deciduous wood environment.

Dating of unit 4 is based on AMS dates from the top of this unit – the humic sublayer rich in ebulis [(depth of 410 cm; square 7/11) – 7950±50 BP (7050–6690 BC) (Poz-22649); (depth of 429 cm; square 7/11 – 7960±50 BP (7050–6690 BC) (Poz-22648); (depth of 395 cm, square 5) – 7960±40 BP (7050–6690 BC) (Poz-22666);

<table>
<thead>
<tr>
<th>No</th>
<th>Taxon</th>
<th>Habitat preferences</th>
<th>Archaeological period</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Unit 4</td>
<td>Unit 3</td>
</tr>
<tr>
<td>1</td>
<td>Pochards – (Aythyini)</td>
<td>open water</td>
<td>5/1</td>
<td>5/1</td>
</tr>
<tr>
<td>2</td>
<td>Rock Partridge – Alectoris graeca</td>
<td>dry, open rocky country</td>
<td>2/1</td>
<td>1/1</td>
</tr>
<tr>
<td>3</td>
<td>Common Quail – Coturnix coturnix</td>
<td>open fields and meadows</td>
<td>1/1</td>
<td>1/1</td>
</tr>
<tr>
<td>4</td>
<td>Rock Pigeon – Columba livia</td>
<td>rocks, cliffs, precipices</td>
<td>26/3</td>
<td>1/1</td>
</tr>
<tr>
<td>5</td>
<td>Pigeon – Columba sp.</td>
<td>rocks, deciduous or mixed forests</td>
<td>13/2</td>
<td>1/1</td>
</tr>
<tr>
<td>6</td>
<td>Swallows Hirundinidae (Crag Martin Pyonoprogne cf. rupestris)</td>
<td>craggy rocks</td>
<td>1/1</td>
<td>1/1</td>
</tr>
<tr>
<td>7</td>
<td>Corn Bunting – Emberiza calandra</td>
<td>open environments, scrub</td>
<td>1/1</td>
<td>1/1</td>
</tr>
<tr>
<td>8</td>
<td>Hawfinch – Coccothraustes coccothraustes</td>
<td>deciduous or mixed woodland</td>
<td>1/1</td>
<td>1/1</td>
</tr>
<tr>
<td>9</td>
<td>Starling – Sturnus sp. (cf. vulgaris)</td>
<td>open environments, open woodlands, rocks</td>
<td>11/3</td>
<td>1/1</td>
</tr>
<tr>
<td>10</td>
<td>Red-billed Chough – Pyrrhocorax pyrrhocorax</td>
<td>high mountains, rocky areas</td>
<td>1/1</td>
<td>1/1</td>
</tr>
<tr>
<td>11</td>
<td>Jackdaw – Corvus monedula</td>
<td>cliffs, woodland</td>
<td>1/1</td>
<td>1/1</td>
</tr>
<tr>
<td>12</td>
<td>Corvids Corvida indet. (Jackdaw or Chough)</td>
<td>cliffs, woodland</td>
<td>1/1</td>
<td>1/1</td>
</tr>
<tr>
<td>13</td>
<td>Hedgehog – Erinaceus sp.</td>
<td>open wood, scrub</td>
<td>1/1</td>
<td>1/1</td>
</tr>
<tr>
<td>14</td>
<td>Mole – Talpa sp.</td>
<td>grassland, woodland</td>
<td>1/1</td>
<td>1/1</td>
</tr>
<tr>
<td>15</td>
<td>Guenther’s vole – Microtus guentheri</td>
<td>dry meadows, grassland</td>
<td>6/4</td>
<td>1/1</td>
</tr>
<tr>
<td>16</td>
<td>Pine Vole – Microtus (Terricola) sp.</td>
<td>meadows, rocky habitats, woodland</td>
<td>2/2</td>
<td>1/1</td>
</tr>
<tr>
<td>17</td>
<td>Vole – Microtus sp.</td>
<td>various habitats</td>
<td>21/18</td>
<td>1/1</td>
</tr>
<tr>
<td>18</td>
<td>Field Mouse – Apodemus sp.</td>
<td>various habitats</td>
<td>1/1</td>
<td>1/1</td>
</tr>
<tr>
<td>19</td>
<td>Mouse – Mus sp.</td>
<td>grassland, bushes</td>
<td>4/3</td>
<td>1/1</td>
</tr>
<tr>
<td>20</td>
<td>Hare – Lepus sp.</td>
<td>open habitats</td>
<td>1/1</td>
<td>1/1</td>
</tr>
<tr>
<td>21</td>
<td>Sheep/Goat – Ovis sp./Capra sp.</td>
<td>various habitats</td>
<td>24/1</td>
<td>1/1</td>
</tr>
<tr>
<td>22</td>
<td>cf. Sheep/Goat – cf. Ovis sp./Capra sp.</td>
<td>various habitats</td>
<td>31</td>
<td>31</td>
</tr>
</tbody>
</table>

The first number in the column refers to NISP (the number of identified specimens) the second to MNI (the minimum number of individuals). Birds (Aves): 1-12; insectivorous mammals (Insectivora): 13-14; rodents (Rodentia): 15-19; lagomorphs (Lagomorpha): 20; even-toed ungulates (Artiodactyla): 21-22
The oak charcoal from the lower portion of unit 4 (depth 460–465 cm, square 14) has been dated to 8590± 50 BP (7730–7530 BC) (Poz-21360). The time span of unit 4 corresponds to the Upper Mesolithic (7950–8590 BP). There is only one date from this portion of sediments which was not included in this time span: 9990±50 BP (Poz-22184), from the depth of 450 cm in square 14.

The lower unit 5 of black-brown clay sediments, strongly plastic, that contained hearths in situ and numerous charcoals. Micromorphology (sample MS 3 on the profile – Fig. 11) shows the vughy-channel microstructure in a larger part of thin sections. Coarse material consists mainly of quartz, sparse feldspars and rocky fragments. The grains of quartz have cracked surfaces and sharp edges. The reddish brown material is anthropogenetically changed. The groundmass consists of loamy silty material mixed with fragmented organic remains and destroyed clay coatings. This sediment fills the cracks; on edges of thin section the decomposed organic remains are vertically arranged. These cracks could be the result of desiccation of loamy and clayey material in the cave. This unit is stratified at a depth of 500 to 570 cm.

Micromorphological analyses were performed also for the hearth in square 14 (sample MS 4 – Fig. 12). The profile of the hearth shows that the hearth was made in a basin-shaped depression subsequently buried by loamy clay, which was then burnt in oxidizing conditions, thus the reddish color (Fig. 13). The crumb and
Vughy microstructure in thin sections occur. The groundmass is more massive. Pore and cracks in the hearth were due to high temperature. In mineralogical composition dominates small quartz grains, sporadically feldspars, biotite and rocky fragments, while the organic matter is represented by charcoals (Fig. 12).

Despite strong anthropization this unit contained only a few stone artifacts in the level of 550–570 cm. Several bladelets (Fig. 14: 1) and one flake were made from radiolarite, black flint and chalcedony. Only one tool was found in this unit: a distal notch on a blade-flake from fine grain brown sandstone (Fig. 14: 2). Moreover, there were blade-flake single platform cores and discoidal cores for flakes made on chunks and limestone pebbles. The chronological position of this unit is based on radiocarbon AMS date on a deciduous charcoal fragment from the top portion (depth 500 cm, square 14): 9940±60 BP (9680–9270 BC) (Poz-21418), and also on the date of 10050±50 BP (9870–9360 BC) (Poz-21359). It is highly probable that the entire unit 5 represents the very beginning of the Holocene, and the lithics are of Early Mesolithic age. The presence of bones of bats – Vespertilionidae family (identification by B. Woloszyn) indicates that the climate was somewhat cooler than the present Mediterranean climate, closer to the conditions of the Pannonian Plain.

**Unit 6** – the lowermost sediment excavated in trench A – is a light brown clay without eeboulis
and without anthropogenic traces, except a backed bladelet from radiolarite (Fig. 14: 3). This unit was uncovered to a depth of 590 cm (Fig. 15). The Final Pleistocene age of this unit is confirmed by the AMS date on a deciduous charcoal from the top portion (depth of 510 cm, square 11) – 11910±60 BP (11980–11620 BC) (Poz-21361).

Despite the rare artifactual evidence the archaeological finds from the base of stratigraphic unit 2 and from the upper/middle part of unit 3 can be attributed to the Monochrome phase of the EN, which preceded the painted phase of this period. Chronologically this Monochrome phase of the EN in Sarakenos, dated between 7860 and 7560 BP (6500–6400 BC) is comparable with the earliest radiocarbon dates from the Greek Neolithic [e.g. 7611±83 BP (6591-6222 BC) (P-169) from Sesklo; 8180±150 BP (7503-6625 BC) (Q-655) and 7557±91 BP (6537-6180 BC) (P-1202) from Nea Nikomede – Pyke and Yiouni, 1996; 7550±60 BP (6461-6215 BC) (LJ-3180) from Achilleion – Gimbutas et al., 1989), including the dates from earliest EN strata at Elateia – Weinberg, 1962 (7480±70 BP = 6450-6171 BC (Grn-2973) – from trench 1, NE part) which is territorially closest (about 40–50 km west) to the Sarakenos Cave.

The lower part of the sequence in Trench A shows two important hiatuses:

1. between units 2, 3 and 4 i.e. between the monochrome phase of the Early Neolithic and the Late Mesolithic, a hiatus of only 120–140 radiocarbon years,

2. between units 5 and 6, i.e. between the Early Mesolithic and the Final Palaeolithic, a hiatus of about 2000 radiocarbon years.

Trench B

Trench B measures 2.80 × 2.50 m. and starts from the level of Middle Neolithic where the soil was undisturbed (Fig. 16). The MN spits 16–22 of Trench A correspond to the spits 1–6 of Trench B and this was also confirmed by the absolute dating in spit 3 (DEM-1164, 6891±25 BP or 5790–5730 BC). A thin layer of the Early Neolithic dates from the end of 7th mill. BC (DEM-1211, 7261±20 BP or 6200–6035 BC).

The Mesolithic stratum comprised many hearths remains, mainly in the NE corner of the
trench, but featuring hardly any finds. The occurrence in this stratum of stone debris from the roof attested to cold climatic phases corresponding to the Lower Mesolithic period. Three absolute dates from this stratum (DEM-1206, 9233±30 BP or 8530–8340 BC, DEM-1209, 9177±31 BP or 8450–8290 BC, and DEM-1210, 9230±30 BP or 8530–8340 BC) dated this layer to the beginning of the Mesolithic. The same thick layer of hearths occurred also in Trench A led to older dates about 600–700 years BP. Other parts of the trench (DEM-1207, 8057±36 BP or 7080–6840 BC and DEM-1208, 8073±30 BP or 7105–7040 BC) were dated to the Upper Mesolithic, contemporaneous to those of Trench A.

The lowest part of the sequence consists of dark brownish clay without limestone rubble and brown clay with weathered limestone fragments filling the channels cut in the bedrock, lined with carbonate precipitations (Fig. 17). The dark brownish clay furnished some Final/Late Palaeolithic (Epigravettian?) artefacts, among them a concave retouched truncation on an obsidian blade. Small charcoals from these sediments have been dated by Radiocarbon Accelerator Unit at the Laboratory in Oxford to 12345±70 BP (13100–12150 BC).

The undated lowest brown clay featured several flint and radiolarite artefacts that can be attributed to the Middle/Upper Palaeolithic transition or to the Initial Upper Palaeolithic. The Levantinoisian points and flakes from centripetal cores occur parallel to the blades detached from bipolar cores, resembling the “transitional” industry from layer VI (trench TD-II) in Temnata Cave (Bulgaria) (Drobniewicz et al., 2000). Among oc-
casional retouched tools there are some side-
scrapers, denticulated-notched implements and a
blade with distal thinning by Kostenki technique.

**Trench D**

Parallel to trench A, from 2004 the excava-
tion concentrated on a new trench (Trench D) in
the centre of the cave (Figs 18, 19). Initially it
measured 4 x 4m but later it moved towards the
south and east and doubled in size (36 sq.m). The
trench was opened at the level of Late Neolithic
Ia, and it revealed floors at various depths, a
plethora of pottery, animal bones, and stone tools.
Furthermore, hearths of special interest were re-
corded. From the start of the excavation extensive
floors and hearths appeared, while finds were
more abundant in the eastern part of the trench.
The LN pottery was plenty and of exceptional
quality, whereas in the Middle and Early Neo-
lithic pottery samples were dramatically reduced.

In Trenches A and D it has been observed
that, while an abundance of pottery and other ob-
jects is noted within the higher strata, the number
of finds falls from the LNIa level downwards, al-
though strata were generally thicker. In some lay-
ers with yellowish clay deposits pottery was con-
siderably scanty. However, the use of the cave in
the Late Neolithic Ia was particularly long, since
it occupies a considerable number of layers.

In the south side in 2005 unusually large figu-
rines of the Late Neolithic were found, whereas at
a limited space of the eastern extension in 2006
fragments of figurines were traced together in
tens, and many more, almost intact. Totally, 160
parts or intact figurines were found around and

---

**Table 2**

<table>
<thead>
<tr>
<th>Sample</th>
<th>Depth cm</th>
<th>Microstructure</th>
<th>Channel</th>
<th>Groundmass</th>
<th>Pedofeature</th>
<th>Organic matter other biological activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>300-310</td>
<td>Subangular blocky, aggregates strongly separated</td>
<td>Vughs</td>
<td>Quartz grains, feldspares, small rock fragment</td>
<td>Typic iron nodules</td>
<td>Clay coating and hypocoating, weak developed and destroyed clay coatings</td>
</tr>
<tr>
<td>2</td>
<td>310-320</td>
<td>Subangular blocky, aggregates strongly separated</td>
<td>Vughs, crumb</td>
<td>Quartz grains, sporadically feldspare rock fragment</td>
<td>Typic iron nodules</td>
<td>Clay coating and hypocoating, weak developed and destroyed clay coatings, clay infillings</td>
</tr>
<tr>
<td>3</td>
<td>500-505</td>
<td>Crumbs, vughs</td>
<td>Vughs, channels, crumb</td>
<td>Orange brown silty loam, b-fabric – grano and mosaicstriated</td>
<td>Typic iron nodules</td>
<td>Clay coating and hypocoating, weak developed and destroyed clay coatings, clay infillings, clay coatings</td>
</tr>
<tr>
<td>4</td>
<td>510</td>
<td>Crumb</td>
<td>Vughs, crumb</td>
<td>Quartz grains, sporadically feldspare, rock fragment, Zone of reddish orange and dark brown silty loam with ash in channels, b-fabric - specled</td>
<td>Typic iron nodules</td>
<td>Clay coating and hypocoating, and destroyed clay coatings</td>
</tr>
</tbody>
</table>
below a horn of deer (Fig. 20). In 2007 the east part of the trench, layers of LN II were dug which gave coarse pottery, mostly rounded. Up to 60 cm depth, figurines’ fragments were spotted which resemble the ones found in 2006. It seems that the layer that contained the figurines extends eastwards, but further deposits, and more recent organic residues, 3 m thick, need to be removed in the future.

Of extreme importance was the revelation of two clay-made pits at the eastern side of trench D (Fig. 21). Around them, at a depth of 1.00 m,
Fig. 18. Ground plan and section of Trench D
spans a Late Neolithic Ia floor of thick clay layer mixed with ashes upon which four post hole were found. The pits were stuffed with stones and soil, and in them coarse Late Neolithic II sherds were found along with animal bones and figurine fragments. These were due to the LN II cutting in deep and intersecting the LN I floor.

In 2007 trench D in its north side reached a Mesolithic level (depth of 1.10–1.40 m). with dark red soil, contained small pebbles, externally decayed, and featured a few flints and more microfauna (Fig. 22). In squares 13, 14 the layer of Upper Palaeolithic was unearthed, which has a fair coloration. Unfortunately, this level has turned into stone in various places due to intense dripping and was hard to detach. This layer was examined at a depth of 2.60 m and gave a marginal number of flints.

The study of stratigraphy showed that the EN layer in trench D is far thinner that the one in trench A, and at its upper side there is a thin layer of eboulis that was also spotted in trench A.

THE POTTERY SEQUENCE

Early and Middle Neolithic

Starting from the beginning of the Neolithic (except for the monochrome phase) the overall quantity of EN and MN painted ware inside the Sarakenos Cave is not large due to the limited use of the cave during these periods. It has been observed that small, thin-walled vases prevailed in this phase, while large coarse vases and pithoids were absent. An analogous case was the Cyclops Cave on Youra (Sampson, 1998, 2008). It has been also noted that closed shapes occur more commonly than open ones.

The typical red decoration on white-cream coloured ground prevailed on the painted pottery during this phase. In most cases, decorative mo-
Fig. 20. Figurines around a horn of deer

Fig. 21. Trench D. Clay-made pits of Late Neolithic II
tifs were painted upon a layer of slip. Decoration repertoire mainly consists of linear and simple motifs that, in comparison with the matt-painted decoration motifs, appear significantly limited in inspiration. Among the early painted ware occur certain motifs related to the creation of a reserved zone in either a lozenge or triangular arrangement; this zone is filled with parallel lines or net pattern (hatched or cross-hatched patterns). The bordering band often occurs in a rhomboid (lozenge) shape.

The painted ware from Central Greece constitutes a separate grouping in pottery than the correspondent one from Thessaly. Theocharis (1973, 77) stresses this differentiation in describing the pottery from Chaeronea as more conservative than the Thessalian ware; he regards decoration motifs from Central Greece as more simple and severe in arrangement than the Thessalian ones, with a prevailing tendency for geometry in style. Efstratiou (1985) had believed that the painted ware from Ayios Petros are to be placed within a wide range of influence from the Chaeronea group and not from Thessaly, where decoration motifs are geometric but are rendered in free style.

Late Neolithic I

In Late Neolithic I except for the plain monochrome and coarse ware (Fig. 23), an important abundance of decorated, matt-painted ware occurs, as well as the distinguished advanced pottery wares, such as the grey, black burnished (Fig. 24), and the urfirmis.

Black burnished ware

The black colour is typical of this period and similar with the corresponding one from Thessaly (Tsangli, the Larissa Culture), Euboea (Varka,
Fig. 23. Types of vases of LN Ia
Tharrounia), and Boeotia. Apart from the vases’ surface, this black colour also penetrates in the interior due to prolonged reducing firing conditions (Childe, 1936/37, 27). In contrast to what was believed until recently, petrological analyses has shown that these vases were fired in relatively low temperatures. Analysed samples from Tharrounia and Varka in Psachna (Sampson, 1977) proved that this pottery ware was fired in reducing conditions and temperatures lower than 750°. An experimental reproduction of this pottery that has defined their specific production procedure was conducted in the labs of the Institute of Nuclear Physics, NCSR Demokritos (Kylicoglou and Maniatis, 1993). The technology of these vases is arguably of particularly high standards, featuring exceptional quality of slip and burnishing. In many cases, their vitrified, most lustrous slip is evocative of the Classical black-glazed vases. Except for the particularly thin walls, what is also evident of the special care taken in their production is their relief decoration, which appears to have been executed with the use of a mould. Burnished decoration is a technique generally found on many samples. It is produced with the use of a burnishing implement, while especially lustrous ornaments appear after firing.

At Otzaki and Arapi Magoula black burnished make their appearance towards the end of the Sesklo phase (Grundmann, 1932, 102, 109). In the Peloponnese, black burnished seem to appear at Franchthi earlier than matt-painted ware (Jacobsen 1973); the same is true for Corinth (Lavezzi, 1978, 430). According to Holmberg (1964, 35) the centre of their production was located in Boeotia and Phthiotis, from where they spread throughout Greece. Moreover, this ware has been located at Lerna (Caskey, 1958), Asea (Holmberg, 1944, 41, 48) and Ayiorgitika in Arcadia (AJA, 1928, 533).

In Central Greece, black burnished have been found at Chaeronea and Orchomenos (Kunze, 1931), Ayia Marina, Souvala, and Kalami in Boeotia (French, 1972), Elateia (Weinberg 1962, pl. 60a,d), Eutresis (Caskey 1960), the Corycian Cave (Touchais, 1980, 132, figs. 21–23), Nea Makri (Theoharis, 1956, 18), Palaia Kokkinia (Theoharis, 1951, Fig. 7), the Euripides Cave on Salamina, Pousi Kalogeris in Markopoulo, the Kitsos Cave (Lambert 1981, pls. X–XXI), and Astakos in Akarnania (Benton, 1947, fig. 11: 71).

**Gray ware**

Although it was initially believed that grey ware was the pottery technique indicating the beginning of the Late Neolithic period, both earlier and more recent digs have proven that both grey and black burnished wares simultaneously appear in the beginning of this era.

In Central Greece such vases have been recovered at Orchomenos, Chaeronea, Elateia, Nea Makri (Theoharis, 1956, figs. 33–36), the Athenian Acropolis (southern slopes), the Euripides Cave on Salamina (Phelps, 1975, 236), the Corycian Cave (Phelps, 1975, fig. 32: 22; Touchais 1980), and Astakos in Akarnania (Benton, 1947, 179; Phelps, 1975, Fig. 11: 66–68). In the Kitsos Cave (Lambert, 1981, pl. XXXIII), grey sherds are limited in number.

In Thessaly, grey ware was mainly found in the Otzaki and Tsangli Phases, together with black and matt-painted wares. They have also appeared in Tsani (AJA, 1947, 174), and Magoula Arapi (AA, 1955, 188).

**Urfirnis ware**

In the Sarakenos Cave, this category is represented by few sherds located within LNIa and MN strata, at the transitional period between the Middle Neolithic and Late Neolithic Ia periods. Clay is commonly reddish, exceptionally pure, without any inclusions, but is sometimes greyish-tile in colour, possibly due to different firing conditions.

The urfirnis pottery is considered as a Peloponnesian innovation that generally diffused in

---

**Fig. 24.** Black burnished carinated bowl of LN Ia
Central Greece, and to the present it has been recovered in Attica, Boeotia, and Euboea. It is still not known why though at Franchthi (Theocharis, 1973) and in other sites in the Peloponnese, such as Corinth (Walker-Kosmopoulos, 1957; fig. 30), and Lerna (Caskey, 1960, 161), the exquisite urfnris vases date from the Middle Neolithic period, in Central Greece they are found in delay within the early phases of the Late Neolithic Ia. However, it could be said that a dating in the transitional period from the Middle to the Late Neolithic is safer in reference to Central Greece. At Varka in Psachna, Urfirnis ware was found within the earliest stratum of the settlement, along with the limited in number MN painted ware, and Theocharis (1959, 287) had already dated this category to the early Late Neolithic period.

**Matt-painted ware**

The matt-painted category belongs to the pottery ware most widely diffused during the Late Neolithic period throughout Greece. Matt-painted ware appeared in the LNIIa phase, soon after the appearance of the black burnished and grey wares, but, unlike these, it features a long duration. It prevailed during the longest part of the successive LNIIb phase, as proven by the excavations of the Sarakenos Cave and the Skoteini Cave at Tharrounia (Sampson, 1993). Vases of the late matt-painted ware may exhibit a greater variety in respect of the ground and decorative motifs colours, whereas bichrome vases with black and red decoration also begin to appear during this phase.

Matt-painted vases in all regions are commonly manufactured from calcareous clay and fired at low temperatures. Typically in matt-painted ware, the colour of decoration motifs is matt and the black paint is made of manganese clays (Kylikoglou and Maniatis, 1993). However, cases where the colour of the motifs is not matt do also occur. Thus, variations in the appearance of these vases have been observed in Euboea, e.g. at Varka of Psachna (Sampson, 1977) and at Tharrounia, where five different groups were specified. A similar variation was also observed in the Sarakenos Cave and Chaeronea (H. Tzavella under publication). The shapes were open carinated bowls or closed vessels with high neck and handles under the mouth 28 open and 14 closed types of vases have been found in Sarakenos Cave.

Matt-painted ware decoration is infinite in variety (Fig. 25, 26). In fact, it can be said that throughout the Neolithic Age it is the Late Neolithic I painted ware that prevails in style, originality, and quality of decoration. A limitless variety of decorative motifs occurs, while certain types are also replicated. A characteristic of the potters’ unlimited inspiration in this period is the fact that one can hardly find any similarities between the decorative motifs of different sites, despite the vicinity, as in the case of Chaeronea, Sarakenos, Varka of Psachna, and Tharrounia.

In the last years, new theories in archaeology insist on the study of semantics of all decorative motifs found on pottery, which certainly cannot be accidental, and in most cases are indicative of the craftsman-potter’s disposition and temperament. The ideological meaning of the decorative patterns is unquestionable, and considering that this material is today available to us only through painted pottery, the value of its significance should be appreciated. Is it merely a coincidence that in the early Late Neolithic period man expresses himself through so many decorative motifs in the entire Greek territory, from Northern Thessaly to the southern end of the Peloponnese? And what could the absence of expression in unpainted and monochrome pottery that prevails in later Neolithic phases mean?

Matt-painted ware is widely spread but particularly abundant in sites of the Peloponnese, such as Franchthi (Jacobsen, 1969, 369), Alepotrypa (Papathanassopoulos, 1996), Lerna (Caskey, 1959, 204), and Corinth (Weinberg, 1937). In Central Greece, this ware occurs at Elateia (Wace – Thompson, 1912, 112, 204), Chaeronea, Orchomenos, Ayia Marina (PAE, 1910, 163–167), Eutresis (Caskey, 1960, 130), the Kitsos Cave (BCH, 1971, 714), Pousi Kaloyeri, Nea Makri (Theocharis, 1956), and the Cave of Pan (Ergon, 1958). In Euboea, a major centre of production should be marked in the valley of Psachna – Triadha, Skoteini Cave at Tharrounia (Sampson, 1993). In Western Greece, this pottery occurs at Astakos (Benton, 1947), and Leukas. In Thessaly, it is widely diffused, with major sites of recovery those of Otzaki, Tsangli and Arapi Magoula (Milojcic, 1955, 173, Fig. 6).
Fig. 25. Fragments of mattpainted pottery

Fig. 26. Fragments of mattpainted pottery
Late Neolithic II

The LNII pottery is under study as a whole here, despite the innovations in pottery technology noted in the second half of this period that introduced new pottery types, such as the numerous red bowls, the rolled rim type, and the last generation of scoops. The abundance of pottery found within the Sarakenos LNII strata is mainly coarse and monochrome, while decorated samples are limited. Clay occurs in various tonalities of colour and it is always well fired. The type of slip prevailing is fairly thick and commonly red, while a black slip is not absent.

Gonia ware

As a rule, this category of pottery is mainly featured by painted decoration in red and black. Decoration in red prevails overall, while the use of black is limited in the outlining the basic decorative motifs in red. Red paint is in this case commonly lustrous, in contrast to that occasionally to be found among matt-painted ware. On the contrary, black paint is dull, obviously due to the materials in use, rich in manganese inclusions. Broad decorative bands/zones constitute another main characteristic of the Gonia-type ware (Fig. 27).

The stratum within which the greatest amount of Gonia-type vases were found is attributed to the early LN II period or the transition between LN Ib and LN IIa phases. Therefore, it is the latest painted ware to have been recovered and the only one of the LN II period. However, its diffusion in Mainland Greece seems to be particularly limited, while the found samples apart from the ones from the Sarakenos Cave are represented by a limited number of sherds from the Cave of Pan and the Southern Slopes of the Acropolis at Athens (for the diffusion of this ware, see Phelps, 1975).

Of critical importance is the question whether these polychrome vases from the Sarakenos Cave and the other above-mentioned sites in Attica are either local products or vases that were transported and diffused from the Northern Peloponnese. The possibility to associate their occurrence with the movement of transhumants, who various scholars have described as transporters of this pottery, seems to be rather a convenient and romantic explanation. Already by the Late Neolithic, the existence of large animal herds can be
accepted, to judge from the huge quantity of animal bones in the cave, while, in order to support them, these would need to be transported seasonally. Stock-breeders transferance from the Peloponnes to the mountains of Boeotia during the summer season has already been mentioned since ancient times and is known to have lasted until recently. Sophocle’s passage referring to shepherds from Argolid on Elikon Mountain (Oedipus Rex) is surprisingly elucidating and, although it was written in the 5th century BC, it refers to significantly earlier periods of time. However, it is difficult to believe that stock-breeders could have used similar luxurious vessels during their moving, unless some sort of exchange commerce was practised at the same time. Nevertheless, systematic analysis of this ware from the Sarakenos Cave and the related sites in the Peloponnesse could possibly contribute more to this problem of provenance.

Pattern burnished ware

It is a category of decorated pottery that has puzzled scholars until recently in reference to its manufacture technique and origins. This is usually a fine quality ware, despite the fact that the clay is commonly featured by many inclusions and a grey core. A thin layer of slip, commonly unburnished, covers the outside, and in the case of open shapes, also the inside surface of the vases. In succession, decorative ornaments are performed with the use of a burnishing tool. After firing, these patterns acquire a lustrous quality and stand out strikingly on the unburnished ground. Microscopic observation (Kylicoglou and Maniatis, 1993) proved that intense burnishing makes clay molecules become more condensed, which results in the characteristic gloss of ornaments. The vases of the pattern burnished ware would be fired at a temperature of 750–800°C, while experimental production of such vases has shown that best results follow the application of a coarse-grained slip.

In the Sarakenos Cave, pattern burnished ware date from the beginning of the Late Neolithic II period, and they co-exist with red burnished ware and bowls of the rolled rim type. This also holds for Euboea and the Peloponnesse (Phelps, 1975, 309). At Kum Tepe, on the other hand, pattern burnished ware have occurred within an earlier stratum and do not co-exist with red burnished bowls.

In Attica, pattern burnished ware have been recovered at Asketario in Raphina (PAE, 1953/54, 66), in the Kitsos Cave (Lambert, 1971, 711), at the Athenian Agora (Immerwahr, 1971, pl. 69: 35), Thorikos (Thorikos, 1967, 24–27), Velatouri (BCH, 1965, Fig. 24), and on Aegina (Renfrew, 1972, Fig. 2; Walter and Felten, 1937, 20–23). In Central Greece such vases occur at Orchomenos (Kunze, 1934, pl. XI, fig. 18) and Astakos (Benton, 1947). In Thessaly this particular ware is rare but has been noted at Tsangli (Wace–Thompson, 1912), Kouphovouno (Theocharis, 1958), and Mylopotamos (French, 1972). In Euboea, it has been found at Plakari in Karystos, Votsika in Psachna, and Tharrounia (Sampson, 1981).

In the Peloponnesse, pattern burnished ware have been recovered at Lerna (Caskey, 1958, pl. 37a,b), Prosymna (Blegen, 1937, 357), Franchthi (Jacobsen, 1969, 1973), Corinth (Weinberg, 1937, 511; Phelps, 1975), in the Klenia and Gonia Caves (Phelps, 1975), at Asea (Holmberg, 1944), Ayios Demetrios in Leprea (Zachos, 1987), and Voidokoilia (PAE, 1977, 250, Fig. 4).

In the Aegean, pattern burnished ware were found at Ayio Gala and Emborio on Chios (Hood, 1981), on Samos (Furness, 1956; Felsch, 1988), at Kephala on Keos (Coleman, 1977, pl. 41C), while samples were unearthed in the Zas Cave on Naxos and Paros (French, 1961, 114). It is interesting to note that this specific pottery ware was hardly diffused in the Dodecanese.

THE FIGURINES

The figurines from Sarakenos Cave, dated in the Late Neolithic II phase of the cave, add up to an important set, both in quantity and in quality. They mostly represent human figures and less frequently animals, with the exception of two miniature marble figurines and a marble beak-shaped acrolith. They are simple representations, however, in some cases, and a tendency towards more naturalism can be observed.

The big-sized heads, legs or feet, make us believe that many of these figurines where actually statuettes, with a height about 0.40 m, perhaps even larger. Similar big-sized figurines were found in Thessaly.
The plastic material of the cave features a considerable number of heads. These are mostly made from a flat (oval or triangular) clay flank stuck on the upper part of a cylindrical neck. The triangular face is common for figurines of this period. It is found throughout the south and north Balkans, the Aegean and Cyprus during the Late Neolithic period.

Amongst the better preserved figurines, we can distinguish a type with joined legs. They are female naturalistic figures, whose lower part has been preserved. Their post is not common, but it can be found in figurines from the mainland.

Contrary to the female, male figurines did not constitute a widely spread choice for Neolithic figurine sculptors. The male ithyphallic torso, indeed, depicts in detail the creases of the body in the stomach area, similar to the torso of ORF33/ Sar 33. Both examples can be – roughly – compared with a male torso from Thessaly. In Sarakenos Cave the male types abound, whereas, generally, during this period they were rarer in the Helladic area.

Finally, we should stress the presence of a new type in the plastic material of Sarakenos, which has had no parallels so far. They are male sitting on the ground figurines, with legs widely spread, so that the plastically depicted phallus is emphasized (Fig. 28). We could even maintain that this type is the male counterpart of female figurines in child-birth position. Of the three examples unearthed, only one allows us to comprehend their position better.

It is the first time such a numerous concentration of figurine plastic material was found in a mainland cave, while both its nature and position are still problematic regarding its use. It is possible, in other words, that, among other, one use of the cave related to cult activities, in which antler usage was involved. In any case, the overall big size of the figurines found in the cave, distinguishes it from other known caves of the LN period. On the other hand, the semantics of these activities and practices perhaps included both male figurines of the type with widely spread legs and female with joined legs as well. We hope that new data will be available in the course of the continuation of the excavation.

The figurine types suggest a local ‘workshop’, with a style intensely naturalistic and forms roughly attributed. The forms share parallels to a series of figurines recently found at a Neolithic settlement near to Thebes. It is noted that all figurines date back to the later phase of the Neolithic (4500–4000 BC), when the figurine manufacture in other areas of Greece had dwindled. The absence of figurines from the lower layers, except for one in Trench A which was dated in Middle Neolithic, is also characteristic.

**EVOLUTION OF LITHIC INDUSTRIES IN THE NEOLITHIC LAYERS**

In the EN and MN layers there are only very few lithic artifacts; this confirms the view that the use of the Cave during several short occupation episodes was limited. In the EN and MN periods Melian obsidian was regularly used (in MN phase 88% of artifacts are made of obsidian); only a few flint and radiolarite artifacts occur. Of particular significance is the occurrence of yellow flint (silex blond), the raw material typical for EN and MN macroblade industries in Eastern Greece.
(Perlès, 1990a; Kozlowski et al., 1996). All the raw materials, including obsidian, were worked off-site. Cores and debitage products from initial core reduction are almost absent; only splintered pieces occur, representing on-site production. End-scrapers and retouched blades represent the group of retouched tools. Starting from the MN tanged arrow heads on blades begin to appear.

The lithic groupings from LN layers are much larger, but also made on obsidian, whose ratio is between 93 and 97%; other raw materials are scarce (flint, radiolarite, opal). Blades, mostly produced off-site, are frequent (laminar index up to 55%). It is noteworthy that the waste from reduction sequences appears more frequently in the case of flint and radiolarite than in the group of obsidian artifacts. The frequency of retouched tools is relatively high (22%). Tools are represented by end-scrapers, retouched blades, dentilated and notched implements, arrow heads (including bifacial points). It is interesting that sickle inserts are very rare: this function could be attributed to some retouched truncations, but only two blades (from the latest LN phase) show high gloss. This indicates minor importance of harvesting activities in the vicinity of the Cave.

The LN assemblages from the Sarakenos Cave are similar to other LN lithics from the caves of central and southern Greece (Skotini – Perlès 1993, Kitsos, Alepotrypa – kind information of G. Philippakis). This similarity can be seen in the high ratio of obsidian (91–98%), off-site production of blade blanks, high index of blades, low index of debitage waste, relatively high index of retouched tools represented mostly by end-scrapers, retouched blades, and the arrow-heads.

**ECONOMY OF THE SITE**

The scarcity of finds does not allow for the reconstruction of the subsistence economy of the Late/Final Palaeolithic occupants when the cave functioned as a short-term camp. Moreover, we can suppose that these groups were not isolated, circulating not only on the mainland but also maintaining contacts with the Cyclades (presence of obsidian from Melos, simultaneously with the first occurrence of this raw material in the Franchthi Cave – Perlès, 1984). More can be said about the Mesolithic behaviour and economy. There is a striking contrast between the high degree of anthropization of the Lower Mesolithic layers and the small number of lithics, particularly in the Late Mesolithic. This is the effect of strong isolation of the Mesolithic groups in the Kopais basin; isolation and difficult access to siliceous rocks resulted to Late Mesolithic groups using local limestone and sandstone pebbles and producing atypical cores and flake artefacts. Another aspect of adaptation to the local environmental conditions was the replacement of big game hunting by fowling and increasing role of plant food. The Mesolithic of the Sarakenos Cave is one of the extreme examples of the changes in subsistence economy and techniques of tool production before the manifestation of the first, Early Neolithic, food production economy.

Unlike the Mesolithic, the EN economy was based mostly on animal (sheep/goat) breeding. The EN, and also MN groups, used the Cave as a shelter for seasonal pastoral activities.

Within Late Neolithic strata (end of 5th millennium BC) large quantities of carbonised seeds found on a floor testify cereal and legume cultivation in the Kopais region (Sampson and Megaloudi, 2006; Megaloudi, 2008). This indicates that the species was stored in that place.

The main species recovered was einkorn, *Triticum monococcum* is a very resistant wheat type and can grow on deprived soils without manure, but the basin of Kopais Lake cannot be considered as a region of such soils. One could say that this “specialization” in einkorn could represent a sort of cultural traditionalism as it was proposed by Sarpaki (1995) in the case of Balomenos Toumba at Chaeronea, where considerable numbers of *Triticum monococcum* were also revealed. The wild ancestor of the species would be *Triticum boeoticum*, a native element of the Greek landscape.

A huge group of animal bones from the Neolithic layers of the cave is currently being studied by Dr Trantalidou. Among the domesticated species occur bones of wild animals, especially cervids.

**CONCLUSIONS**

The Sarakenos Cave is therefore central to the research of the Neolithic not only because it is one
more case of cave settlement, but also because the nature of its findings initiates a discussion on the importance of the symbolic items for caves, and, generally, the notional or symbolic character of the cultural material of caves. The par excellence symbolic items in Sarakenos Cave, such as figurines, also pose the question whether certain symbolic activities took place inside the cave, even ritual or sacral.

Sarakenos Cave is of crucial importance for the study of the Mesolithic/EN interface. There is a striking contrast between the isolated Mesolithic, notably Late Mesolithic, occupations with “primitive” technology adapted to local raw materials and with subsistence economy based on fowling and plant gathering, also adapted to the local environmental conditions and the EN groups, arriving to the cave some 120–140 radiocarbon years later, with imported raw materials, macroblade technology and animal breeding.

It is also of great importance that inside the cave a very early phase of the Mesolithic was established, dating from the 10th mill. BC, even though the finds were scarce. Furthermore, a chronological sequence in the 9th and 8th mill. was also established. So far, the Lower Mesolithic had been dated to the middle of the 9th mill. BC in the Cyclops Cave (Sampson, 1998; Sampson et al., 1998, 2003) and in the Franchthi Cave (Perlès, 1990b, while the Mesolithic settlement of Kythnos (Sampson et al., 2002; Sampson, 2006b) dates from a very early phase of the Lower Mesolithic in the beginning of the 9th mill. BC. It seems that the Mesolithic period in the Helladic area which has been studied extensively recently, is bound to surprise us in the future.

Our research in the area suggests that the evidence for Palaeolithic settlement in the Kopais basin is rather irregular. The Sarakenos Cave saw sporadic visits by Epigravettian groups and in the Seidi Cave (Stampfuss, 1942; Schmidt, 1965) we have evidence of Late Gravettian occupation. In some other caves and rock shelters examined in the basin and around it, Palaeolithic remains were found (Roland, 1980). The issue will be clarified through excavations in some of these sites. However, with the exception of the Sarakenos Cave, the absence of Early Upper and Middle Palaeolithic remains in this area is striking, while in nearby Euboea (Sampson, 1996) there are several open air sites of this period. This is probably due to palaeogeographical or palaeoclimatic reasons.

Unlike the Palaeolithic, during the Neolithic period and the Bronze Age the human occupation in the Kopais basin appears to be present both in open air and cave sites. In this period, the Sarakenos Cave dig gave ample archaeological evidence for regular exploitation of the aquatic resources (fish, shells). It is rather probable that in some places around the lake existed lake settlements as in Kastoria (Chourmouziades, 2002) and Xynias Lake (Sampson, 1980).

Acknowledgments

The Sarakenos Project is supported by the University of the Aegean and INSTAP. The Polish participation in Sarakenos project has been supported by Specific Targeted European Union Research Project FEPR (The Formation of Europe: Prehistoric Population Dynamics and the Roots of Socio-Cultural Diversity).

REFERENCES


CHILDE G. 1936/3. Neolithic Black Ware in Greece and on the Danube, British School of Athens 1936/7, 27.


CHOURMOUZIADES G. 2002. Dispilio 7500 years later, Thessaloniki.


FRENCH D. 1972. *Notes of prehistoric groups from Central Greece*, Unpubl. Dissert. in BSA.


MEGALOUDI F. 2008. The Sarakenos Cave: archaeobotanical remains from the Late Neolithic levels, in A. Sampson, *The Neolithic and Bronze Age occupation of Sarakenos Cave in Boeotia (Greece)*, Cave settlement patterns and populations movements in Central and Southern Greece.


SAMPSON A. 1996-98. Three Early Neolithic sites in Euboea and their contribution to the Aegean prehis-


THEOCHARIS D. 1959. From the prehistory of Euboea and Skyros, Arch. of Euboean Studies 6, 279–328.*


WALKER-KOSMOPOULOS L. 1948. The prehistoric inhabitation of Corinth.


* in greek