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From the Editor

Editorial responsibility for the newsletter is now shared between Madison and Edinburgh. I shall edit all the issues up until May 1992; thereafter Doug Price will edit the November issues, while I shall continue to edit the May issues. So please forward your manuscripts, notes and new publications to me for the May 1992 issue. The deadline for that issue is 30 April.

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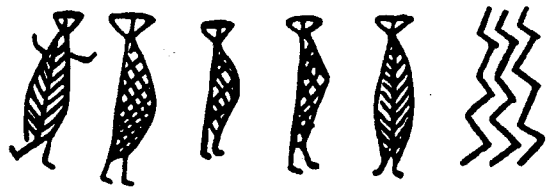

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RESEARCH REPORTS

Areeiro III, an open air site dated to 8850 BP (Rio Maior, Portugal)

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Areeiro III was found by Nuno Bicho, David Pease and João Ladeira during the 1989 field season of the 'Upper Palaeolithic of Portuguese Estremadura Project' in the Rio Maior area, directed by Drs Anthony Marks and João Zilhão under a multi-year NSF grant. The site was of apparently Late Upper Palaeolithic age. Located on the edge of an active sand quarry, its complete destruction was imminent. Three test pits were excavated to obtain artifact samples to identify the assemblage, as well as to acquire samples for TL and ^{14}C dating. The artifact sample showed that this site was very different from the other Palaeolithic assemblages known in the area, and it was important to have a large excavation to obtain more complete information. Consequently, salvage excavations were carried out, supported by the Portuguese Government, during the months of July and August 1989. The site is now completely destroyed by the sand quarrying.

In this issue . . .

Areeiro III is located 2km north of the town of Rio Maior (Portuguese Estremadura), on the west edge of the valley of the Ribeira da Pá, a tributary of the larger drainage with the same name of the town (*Figure 1*). The area is very rich in Late Upper Palaeolithic sites (Bicho in press, 1991; Marks *et al.* 1990), but presently, only one other site of early Holocene age, still under research, is known in this valley.

The Pleistocene/Holocene geology of this valley is characterized by different episodes of æolian redeposition of the local Miocene sands (the local bed rock), together with colluvial action. These æolian episodes occurred during the Upper Palaeolithic and persisted, at least, until Neolithic times. This valley has several water sources in the vicinity of the site, very good quality flint sources (Marks *et al.* 1990), and a natural salt outcrop.

When discovered, the top part of the sand dunes had already been removed by heavy machinery. Artifacts were spread over more than 10,000m², but the intact area was limited to *ca* 300m², cut through the middle by a buildozed road (*Figure 2*). The site overlays the Miocene white sands that had been eroded at some point, probably during the Pleistocene (Unit I) (*Figure 3*). Unit II is a gravel layer that fills in the erosional channels in that area. Unit III is composed of yellow (Munsell 10YR7/6) medium sands. The archaeological material is deposited in these sands. Unit IV is very similar to III, but there are almost no artifacts and the colour changes gradually from yellow to reddish-yellow (7.5YR6/6) sands. Unit V is the humic layer corresponding to the modern surface, with grey sand and organic material. These sands have probably two origins, the colluvium from the top of the hill located to the west, and redeposited local Miocene sands. The lithic material was vertically spread, but there was a unimodal distribution some twenty centimetres above the gravel layer. In the area where the site was located on the depression caused by the old erosion, the artifacts were vertically spread over a thicker area, since instead of about one metre of sediment there was over a metre and half. This is probably a consequence of a palimpsest of occupations on that specific point, and not of vertical movement of artifacts.

Excavation was carried out in 1m² units divided, when needed, into four quadrats. More than 30m² and *ca* 50m³ of sediment were excavated. Owing to the lack of time, and since artifacts were spread between 40 cm and 150 cm of thickness, vertical control was based only on 10- and 5-cm spits, depending on the frequency of artifacts. Three-dimensional plotting was not used, since there was great vertical dispersion of artifacts and since, based on results of the first three test pits, there was only a single cultural level. All fill was screened through 2mm mesh. Features and stratigraphic sections were photographed and drawn. Soil samples were collected for sedimentary analysis. Over 80 charcoal samples were collected for both ^{14}C dating and botanical identification. Fifty samples of burnt flint were also collected for TL dating.

Excavation was carried out in five different areas, called Area 1, Area 2, Test I, Test III, and Test VI. Various features were found in these areas. In Area 1 there were two hearths. The one in unit A24 (fireplace 1) was a single very dark greyish-brown (10YR3/2) spot, with a circular shape (*ca* 55cm in diameter and 40cm deep), and a conical profile,

cutting the gravel layer (Unit II) (*Figure 4*). The second hearth (fireplace 2) was located in Units A23 and A22. This hearth, again, was circular and had a conical profile of a black (7.5YR2/0) sand. In its centre there were large pieces of charcoal *ca* 15x5x5cm in size. Both hearths had similar dimensions and a very large number of little bits of charcoal. In Test I, there was a rock feature, where the sands presented no special coloration. The rocks all had dimensions between 3 and 15cm. The feature was *ca* 50cm in diameter and 15cm thick. Again, a higher concentration of little pieces of charcoal was present. A similar feature was present in Test VI.

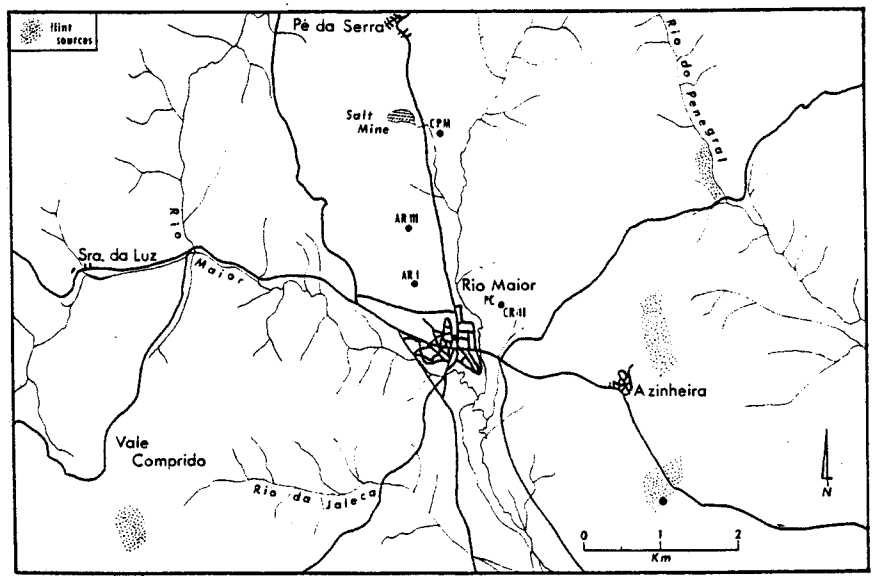

Figure 1: Map of Upper Paleolithic and Epipaleolithic sites in the Rio Maior area.

There are four ^{14}C dates for the site, obtained through the good offices of Dr João Zilhão. The two hearths from Area 1 were dated. Fireplace 1 is dated to 8570±130BP (ICEN-545), while fireplace 2 is dated to 8850±50 BP. Area 2, Units B10/B11, dates to 8380±90 BP, and Test VIb dates to 8860±80 BP. These dates suggest that the site might have been visited over a few hundred years.

Based on a preliminary classification (*Table 1*), the lithic assemblages from Areas 1 and 2 are slightly different. While they have basically the same types, there are differences in the frequencies of some of the important tool types. Apparently, these assemblages are characterized by an abundance of notches on flakes, and partially retouched pieces, of which the majority are on flakes. Denticulates, mostly on flakes, are also very abundant. These three tool classes account for *ca* 50% of both collections.

However, there are other important groups, such as end-scrapers and microliths. The former are very important in Area 1 representing more than 30% of the retouched tools, while in the Area 2 end-scrapers account for only *ca* 20%. The microliths account for more than 15% in Area 2. In the end-scraper group, the carinated forms are clearly most important. These scrapers are very small and very standardized. Although there are some flattish nosed end-scrapers, there are no real flat-nosed scrapers, and, consequently, all were considered as thick nosed/shouldered end-scrapers. The burins

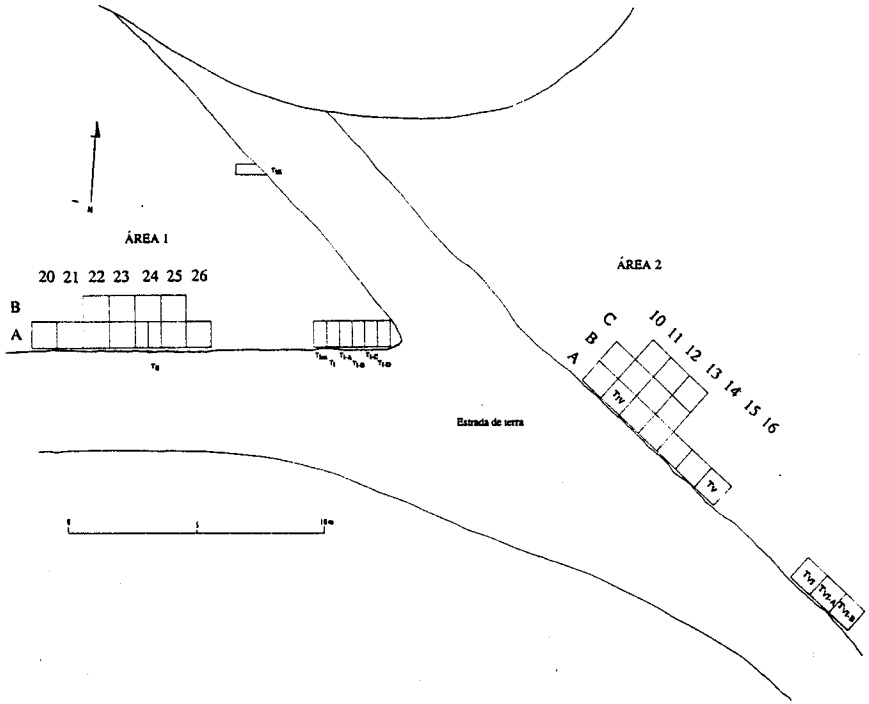

Figure 2: Map and excavation grid of Areeiro III.

are not numerous, but some of them also show a carinated form. The microliths are marked by the presence of very small (<15mm in length), thin, twisted bladelets, produced during the carinated tool manufacture. These bladelets (more abundant in Area 2) are characterized by a very fine, semi-abrupt retouch that can be obverse and inverse or alternate, usually heavier at the proximal end and getting lighter towards the distal end. These bladelets were called 'Dufour bladelets' to avoid the creation of new tool designations. At the same time, other finely retouched bladelets are present, as well as

pointed retouched and backed bladelets. In Area 2, there are two arched pointed backed bladelets and two micro-gravettes. In these two areas, only one fragment of a trapeze was recognized. Another trapeze was detected during excavation in Test VI. The very low number of geometrics in these assemblages separates them from the common Mesolithic industries known in Portugal. In fact, the assemblages are extremely similar both typologically and technologically (except with regard to the 'carination technique'), to the Final Upper Palaeolithic industries of the Rio Maior area. Although detailed studies have yet to be carried out, the cores seem to show a wide variability of forms, testifying to both flake and bladelet reduction strategies.

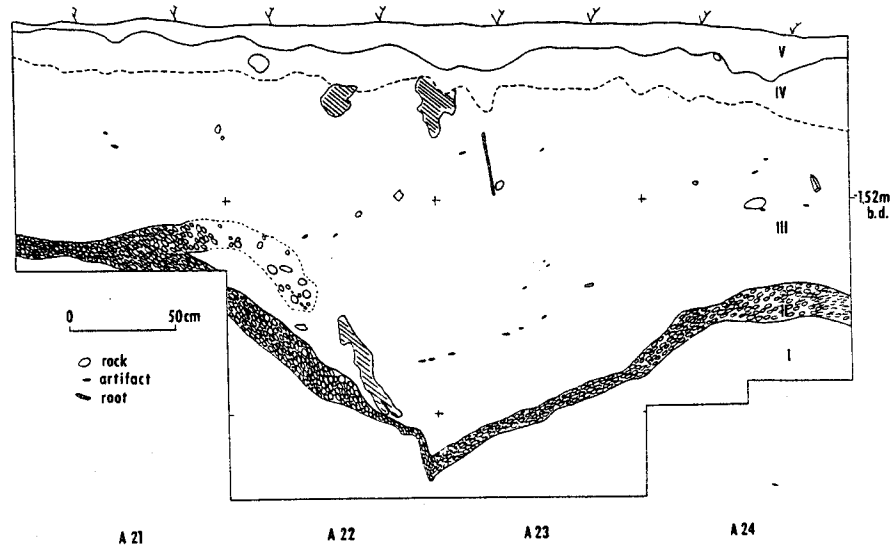

Figure 3: North section of Areeiro III, Area 1.

The preferred raw material at this site was a red flint, obtained a few kilometres to the east and southwest (Marks *et al.* 1990). Quartzite was the second most important raw material, but was apparently used mainly for heavier tools and in a more expedient manner than was flint, while quartz was sometimes used for small scrapers or burins. Also there is a single rock crystal retouched bladelet. The few grinding stones found (two in Area 1 and one in Area 2) are made of conglomerates, present in the gravel layers of the valley. There are also four hammerstones made out of quartz or quartzite. All of these raw materials, except the flint, still are, and probably were, available in large quantities in the local Quaternary terraces, Holocene alluvials, and river cuts. Consequently, this suggests that there are no exotic raw materials present in this site, pointing to a relatively

stable local population, using the local resources, probably using and/or returning to the same site during a few hundreds of years.

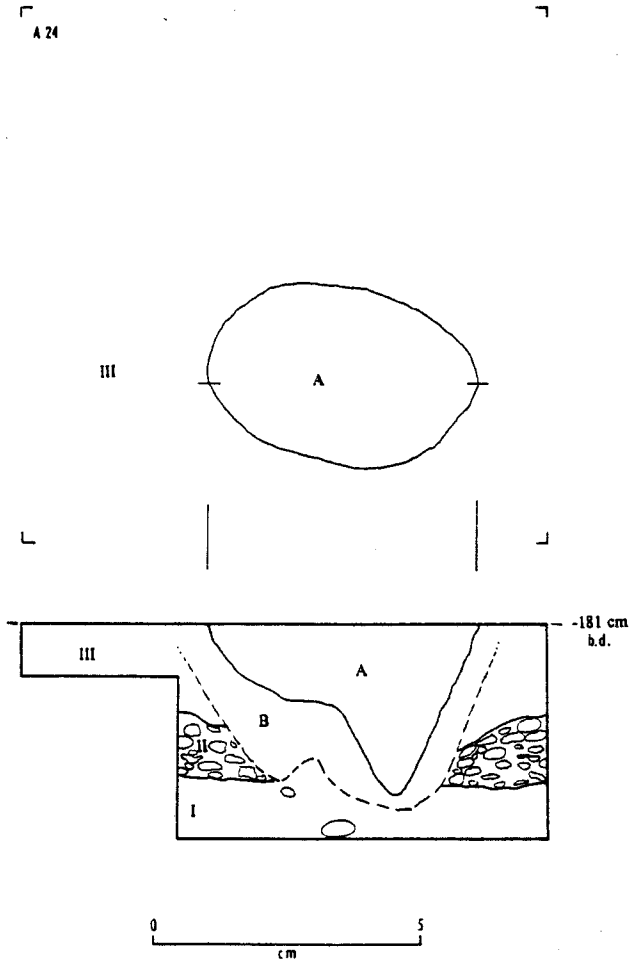

Figure 4: Section and plan view of hearth 1 – Areeiro III, Area 1.

Although there are other sites in Portugal dating to the beginning of the Holocene, nothing is fully comparable to this site. In 1988, northeast of Rio Maior, close to Fátima, Arnaud carried out a salvage excavation of a cave site called Gruta do Casal Papagaio

(González Morales and Arnaud 1990). The site yielded one date on shell, with a result of 9710 BP. While fauna was abundant, including human remains, no lithic material was found.

In the Torres Vedras area (Estremaduran coast), there is a dated site, Ponta da Vigia, dating to *ca* 8700 BP (Zilhão *et al.* 1987). The assemblage is mostly from surface finds, but there was a small area excavated with fireplaces *in situ*. The important aspect of this collection is that there are a considerable number of geometrics (all triangles) and other Epipalaeolithic points such as Hamburgian and arched backed.

Some 40km south of this site, there is the shell midden of S. Julião, excavated by Arnaud (1986). This site is dated to between 8800 BP and 7500 BP (González Morales and Arnaud 1990), and while not having any geometrics it is in Arnaud's opinion clearly Mesolithic. In the same area, in the consolidated sand dunes of Magoito, there is a site, with some small circular rock features, interpreted by Arnaud as hearths (González Morales and Arnaud 1990). This Holocene occupation is dated to *ca* 9500 BP. Some shells of both terrestrial and water molluscs were found with some 'atypical flints' (Pereira 1983).

On the southern coast, in Vila Nova de Milfontes, preliminary work was carried out by Arnaud and Vierra in the Eira da Pedra shell midden dated to *ca* 10,000 BP. Apparently of 'Mirian' characteristics (Vierra, pers. comm.), this site did not contain many diagnostic artefacts besides the 'Mirian' axe and, consequently, is believed to be a Mirian shell midden, or at least related to those assemblages . Palheirões do Alegra, a Mirian open-air site located in the south-west coast of Portugal, is dated to *ca* 8400 BP (Raposo *et al.*, in press). The site has 2 different lithic components. The most numerous is a macrolithic industry made of locally available quartzite and greywacke, while the second, a microlithic component, is made out flint (of unknown source). The other component is very similar to a Late Magdalenian, with very small thumbnail scrapers, dihedral burins, and backed and retouched bladelets, but only very rare carinated end-scrapers . More recently, during the 1990 field season one level at the site of Cabeço do Porto Marinho was thought to be a very late Magdalenian or an early Epipalaeolithic occupation. A ^{14}C date showed that, in fact, it is of early Holocene age (*ca* 9000 BP) (Marks and Zilháo, pers. comm.). The tools clearly have Magdalenian characteristics, with only two geometrics found and no carinated.

Apparently, there are some affinities among these assemblages: 1) the presence of small retouched tools typically classified as Upper Palaeolithic, and 2) the insignificant role of geometrics, commonly associated with the later Portuguese Mesolithic of the large shell middens of the Tagus and Sado valleys. Also, these assemblages present a wide diversity in microlithic tools (e.g. backed bladelets in Magoito and Palheirões do Alegra; microlithic points such as Sauveterre and Hamburgian points in Cabeço do Porto Marinho and Ponta da Vigia; and finally, the little Dufour bladelets from Areeiro III). Diversity is also present in the site locations and, consequently, different kinds of ecological niches were exploited. While, there were no faunal remains in both Cabeço do Porto Marinho and Areeiro III, land resources were probably more important than estuarine and

Table 1: Preliminary typological classification of the Areeiro III assemblage

Types	*Area 1*	%	*Area 2*	%
simple endscraper	6	0.9	10	2.8
double endscraper			1	0.3
ogival endscraper			1	0.3
end-scraper on retouched blade	2	0.3	3	0.8
endscraper on flake	32	4.8	3	0.8
unguiform endscraper	2	0.3	3	0.8
carinated endscraper	81	12.2	30	8.5
nosed/shouldered endscraper	69	10.4	23	6.5
nucleiform endscraper	6	0.9		
endscraper–burin	2	0.3	1	0.3
perforator	1	0.1	1	0.3
dihedral burin	22	3.3	9	2.5
burin on snap	8	1.2	13	3.7
busked burin			3	0.8
burin truncation	7	1.1	6	1.7
transverse burin	3	0.5		
plan burin	4	0.6		
backed blade	1	0.1		
truncation	2	0.3	4	1.1
retouched piece	90	30.6	45	12.7
notch	201	30.3	75	21.2
denticulate	67	10.1	41	11.6
scaled piece	17	2.6	6	1.7
sidescraper	13	2.0	10	2.8
trapeze			1	0.3
truncated bladelet	1	0.1	1	0.3
backed bladelet	2	0.3	14	4.0
notched bladelet	1	0.1	2	0.6
Dufour bladelet — obverse	6	0.9	18	5.1
inverse	5	0.8	9	2.5
alterne	4	0.6	7	2.0
retouched pointed bladelet	1	0.1	2	0.6
retouched bladelet	4	0.6	10	2.8
total	664		354	

maritime resources present at most of the other sites (e.g. Ponta da Vigia, Magoito, S. Julião, Eira da Pedra). Although there are some differences in the location of these sites, they are all on the coast with the exception of the two sites from Rio Maior. This is probably a consequence of the modern work that has been traditionally along the shore and/or in specific areas such as river valleys, and is not a characteristic of the original settlement system of the early Postglacial human groups of central and southern Portugal.

The typology and technology of the lithic assemblages suggest that Areeiro III, in spite of its age, is, in fact, closely related to the Final Upper Palaeolithic occupations of central and southern Portugal and not to other sites of more recent Holocene age, where geometric microliths play a very important role. Given this limited information, it seems that Areeiro III, as well the other sites mentioned here, reinforces the idea of continuity between the Final Upper Palaeolithic (locally represented by Magdalenian facies) and Epipalaeolithic times, which seems to be true also in northern Spain between the Magdalenian and the Azilian (Straus 1991).

Only more extensive research can bring light to the 'transition' between the Final Upper Palaeolithic and the Mesolithic, apparently later in Portugal than in other regions of southern Europe. Again, and based on the local Upper Palaeolithic, it can be argued that the chrono-cultural stratigraphy found in northern Spain and in southern France cannot be applied to Portuguese prehistory, as traditionally has been done.

Acknowledgements

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The Final Mesolithic of the north Black Sea steppe zone and the formation of the Neolithic

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To understand the ethno-cultural situation in the early Neolithic of the north-east Black Sea steppe zone, it is necessary to consider the late Mesolithic. It is now appreciated that, almost everywhere, the origin of the Neolithic was linked to the development of the local Mesolithic, characterized by numerous routes of migration to new territories and by the establishment of different cultural contacts. The population units generated in the Mesolithic persisted into the Neolithic and continued their development at the new social stage. The same process took place in the region to the north east of the Black Sea, where we can see the distinct traces of different routes of the Neolithic formation. There was a degree of assimilation and influence between the indigenous and incoming cultural elements.

Investigations in south-east Polessje (forest–steppe zone, adjacent to the steppes) and in the basin of the Seversky Donetz river, together with excavations of early Neolithic sites in north-east Priasovie are of particular interest.

In Polessje three groups of sites can be identified: (i) sites with arrowpoints of Swiderian and post-Swiderian types; (ii) sites with micro-blade industries; and (iii) sites with Janisławice points (*Figure 1*, 1–29). The first group tends to occur in an arc around the European forest zone of Poland and neighbouring areas — the Baltic Sea area and the Volga–Oka basin. Here, the southern component is insignificantly small, suggesting only weak contacts with the southern cultures. The second group is characterized by micro-blade production with the backed bladelet as an important feature accompanied by other typical microlithic forms. This group is attributed to the southern province with blade industries. The third group is the most original owing to the presence of Janisławice points (absent in the other groups) and post-Swiderian points of different types which spread over the Baltic Sea area. The distinctiveness of this group lies in the association of these types with the developed blade technique, based on full-sized blades rather than micro-blades. It is also characterized by the presence of a small number of microlithic forms including single trapezes and segments, as well as the presence of Kukrek burins and insets. This group shows signs of cross-influences from the other cultures — from the Baltic Sea arc on one side, and from the Black Sea and Caucasian regions on the other.

The whole industrial complex, formed in the Mesolithic through active and diverse contacts, continued into the Neolithic which is distinguished only by the appearance of pottery. As for the Neolithic industrial assemblage, it is entirely superimposed on the Mesolithic ones. The early Neolithic (known as Roudyi ostrov) contains elements from the Baltic Sea region and the Asov and Black Sea region, with the latter dominant, and

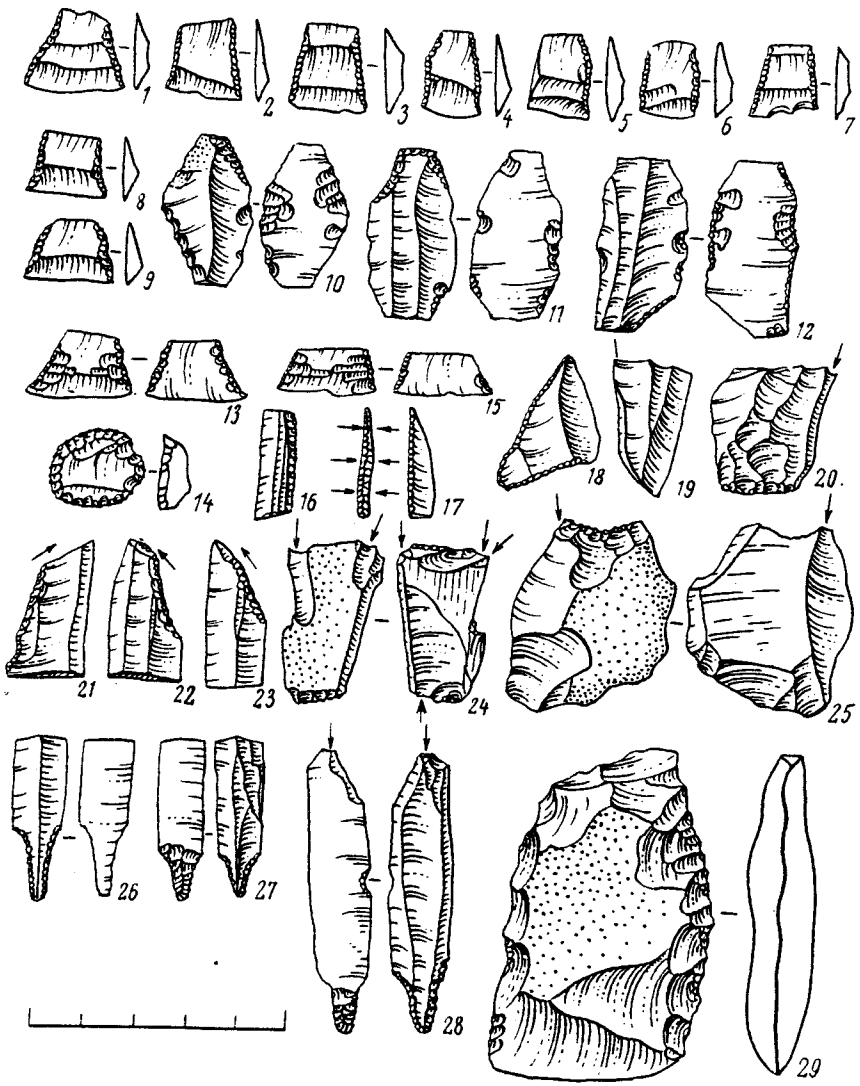

Figure 1: The Mesolithic industrial complex of the Polessje sites (after L.L. Zalizniak).

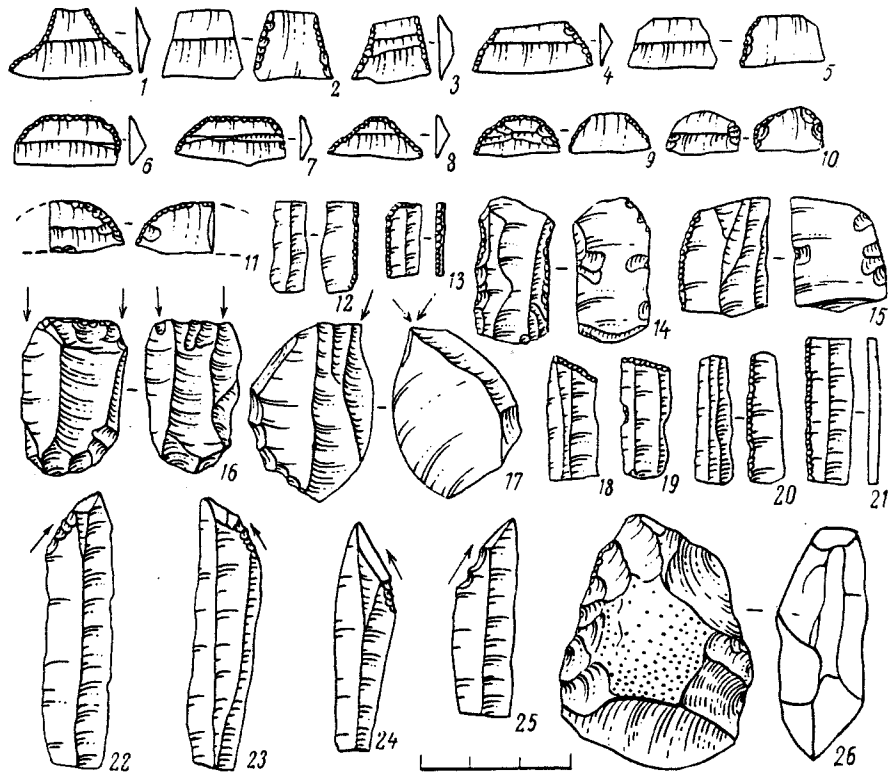

Figure 2: The industrial complex of the Donetz Mesolithic Culture (after A.F. Gorelik).

includes Kukrek forms.

A similar situation occurred in the basin of the Seversky Donetz river, where groups of sites belonging to the different cultural circles are found. One group of sites is characterized by a blade industry, including geometric microliths — trapezes, various types of points (except Janisławice points) — and by the complete absence of the other type, peculiar for the cultures of the forest and forest–steppe zones. This group is attributed to the region of the south Russian cultures. Another group is characterized by a poorly-executed blade technique, by large scrapers and burins, by the presence of cutting-down implements, and by the absence of geometric microliths. In addition, this industry is characterized by Janisławice points and other items permitting comparisons with the Mesolithic sites of the Baltic Sea zone. On the basis of its typological characteristics, this group is attributed to the Janisławice culture area, although it has its own local peculiarities.

As a result of contacts between these groups, the Donetz Mesolithic culture was formed. In general terms, its lithic assemblage includes the blade technique of primary splitting, a set of micro-implements, with the addition of Janisławice points and other elements of the Baltic Sea region (*Figure 2*). A special group has an influence of north Caucasus culture, first of all in the tradition of bilateral retouch (of segments in particular), in the form of a high trapeze with concave sides and in the retouching of the ventral face. All these features show the existence of constant contacts and probably direct migratory processes extending over a wide territory from the north Caucasus up to the north west, evidently through south-east Polessje, at the end of the Mesolithic period.

The early stage of the Donetz Culture belongs to the Mesolithic, and the developed stage to the early Neolithic, demonstrating a direct succession (probably genetic) without influences from other cultures. However, the basic Mesolithic industry undergoes modification. New features appear; the inner-type technique declines, the secondary tooling technique undergoes changes, and the gently sloping retouch and a number of other distinctions develop. On the whole, the territory of the north-east Asov area is a zone of contacts between two vast ethnocultural regions — the steppes and the forest–steppes, one of which is attributed to the Asov and Black Sea province, the other to the circle of the forest–steppe cultures.

The early Neolithic of Matveev Kourgan type, the sites of which are situated in the north-east Asov Sea area, is quite distinctive. It lacks the Kukrek and north Caucasian elements, as well as the north-west impulses — Janisławice and other Baltic Sea area traditions (*Figure 3*, 1–24).

The Matveev Kourgan Culture is based mainly on the production of quite large blades which were used as blanks, insets and implements. In primary débitage we can observe minimal preparation of the nucleus and limited secondary retouch in the production of the tools. The industry is characterized by relatively small numbers of categories and types, as well as small amounts of items in most of them. The leading categories of the blade complex are plates, blades, and sections with or without retouch. The only well-

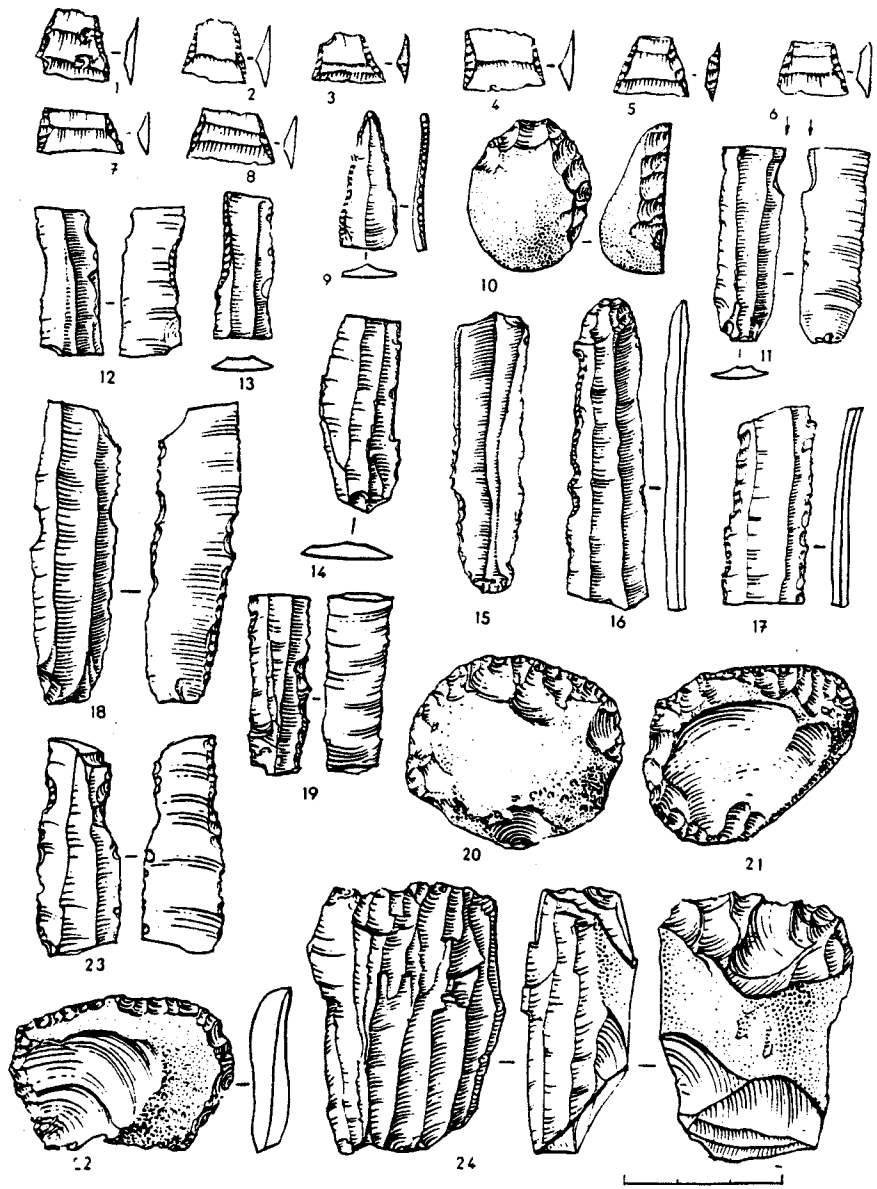

Figure 3: The industrial complex of the Matveev Kourgan sites (after L. Krijevskaya)

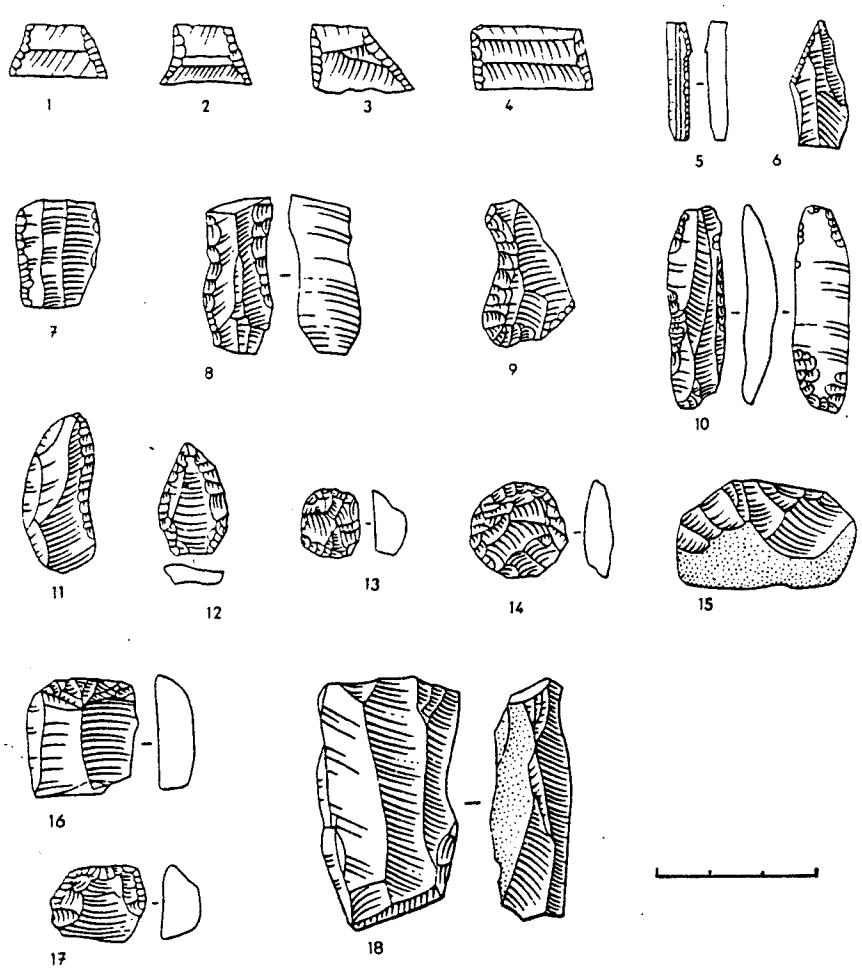

Figure 4: The industrial complex of the Grebeniki Mesolithic Culture (after V.N. Stanko).

represented category are trapezes (89 pieces). In the same industrial complex there are scrapers (>1000 examples) and knives made on flakes. In general, poor development of the forms characterizes the Matveev Kourgan industry. In this rather archaic industrial complex, which is combined with a developed schistose industry, there appears pottery, probably the earliest known in Eastern Europe. It includes the so-called 'prior to the vessel stage' — indeterminate fragments and small plastics, as well as ancient vessels found also in fragments. Stock-raising also appears; there are bones of domestic pig, sheep/goat and ox.

Thus, the Matveev Kourgan Neolithic is represented more fully and thoroughly in respect of the Neolithic described above. In the author's opinion the Matveev Kourgan Neolithic is related to the development of the local Mesolithic. Most probably, it is genetically related to the late Mesolithic Grebeniki Culture. This conclusion is based upon the large number of similarities between the two cultures. These include the same peculiarity of the primary splitting, a large number of tools without secondary working, and the relatively small number of artifact categories and types (*Figure 4*, 1–18). One can see the same weak development of forms and absence of all geometric tools except trapezes. It is interesting that in both cultures we can see the prevalence of one type (low, symmetric) that can be more probably explained by traditions.

The Donetz Mesolithic culture probably played a definitive role in the formation of the Matveev Kourgan Neolithic. Its heritage can be seen in the unpolished flint axes which existed as relics alongside the polished axes. The common features of the Matveev Kourgan and Grebeniki industries are obvious, though in the former some modifications take place. The most important is the disappearance of the inherent-to-the-Mesolithic micro-complex.

It is now possible to draw some conclusions. First of all, the Neolithic of the Black Sea steppe arose from its own Mesolithic basis. The transition to the Neolithic was realized without substantial innovations or intrusion from outside. But, owing to the distinctions in the formation of the Mesolithic units, the early Neolithic looks like a rather mixed picture — sometimes the north-west traditions and sometimes the Asov–Black Sea ones prevail in the different parts.

In this connection the Matveev Kourgan Neolithic, the origin of which may be attributed to the Grebeniki Culture, is of special interest from an ethno-genetic viewpoint. The Grebeniki Culture also appears to preserve the features of its local origin, because it can be traced back genetically to the local late Palaeolithic and to the Mesolithic sites of the Zarinka–Ossokorovka type. In the Black Sea steppe zone also, along with the above-mentioned Mesolithic structures, there existed a sufficiently strong original line with the autochthonous way prevailing, the genetic roots of which go back a very long way into the past.

This is how we give concrete expression to the thesis on the different ways of forming the Neolithic in the Black Sea zone.

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Excavations in Ulva Cave, western Scotland 1987: a preliminary report

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The Ulva cave excavation is part of a major programme of research into the early settlement of Scotland. The primary objective of this research is the discovery and investigation of sites which preserve evidence of human occupation dating to before 9000 BP. Other objectives include the recovery of evidence for climatic, faunal and sea-level changes that formed the background to Late Devensian and early Holocene settlement.

The first season of fieldwork on Ulva was carried out over a 5-week period in July–August 1987, and involved a small team of specialists and volunteer excavators. Grants to support the fieldwork were provided by The Carnegie Trust for the Universities of Scotland, Edinburgh University Department of Archaeology Fieldwork and Research Fund, The Royal Archaeological Institute, The Society of Antiquaries of London, and The Society of Antiquaries of Scotland.

The Site

Ulva is a small island, roughly 8x3 km, off the west coast of Mull from which it is separated by a narrow, shallow sound. Its geology is largely the product of Tertiary volcanic activity, the island consisting of a series of more or less horizontally bedded basalt lavas. The landscape was subsequently modified by Quaternary glaciation.

The Ulva Cave (NM 431384) is situated some 300m south west of the summit of A'Chrannag in the south east of the island, and about 400m from the present shoreline (*Figure 1*). It consists of a large single chamber which opens out from the base of a basalt cliff, via an entrance which is 10m wide and up to 3m high. The chamber itself is roughly trapezoidal in plan, and is *ca* 17m deep (measured inwards from the drip-line) and *ca* 16m wide. The present floor of the cave is at an average height of 48.5m O.D. From the cave entrance vegetated scree extends down to a basalt step at an altitude of *ca* 39m O.D. This step may be a marine erosional feature. It is possible, therefore, that the cave was originally formed by the sea at that level. If this interpretation is correct, then the cave

can be expected to contain up to 10m of sediments.

Little is known of the recent history of Ulva Cave. It is reported to have been used by the grandparents of the explorer, David Livingstone, as a home for several years before they moved onto their croft, and that during the nineteenth century clearances crofters hid their cattle in the cave (Macintyre 1984: 638). The only record of any previous 'excavation' is of a trench dug by geologists from the Geological Survey of Scotland in the early 1900s (Bailey *et al.* 1924: 390) in order to investigate the nature of the cave infilling.

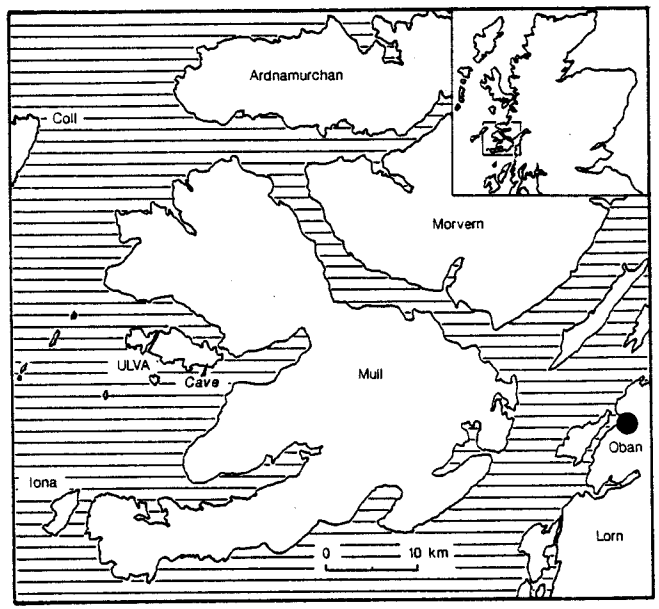

Figure 1: The location of Ulva Cave.

The cave floor deposits

The deposits which form the floor of the cave are very variable (*Figure 2a*), occurring beneath a thin layer of animal dung.

The greater part of the floor area is apparently underlain by till-like sediments. These can be divided into a number of stratigraphic units which differ in terms of colour, texture,

stone content and structure. The clast content is variable but always includes a proportion of non-local (erratic) lithologies; the matrix varies from clay to sandy loam. These sediments are considered to be of glacial origin, but their mode of deposition within the cave is problematical. Provisionally, they are assigned a Late Devensian (= Late Weichselian) age.

In places the till-like sediments are overlain by more recent deposits. The cave entrance is partially blocked by angular basalt rubble. Although this probably includes some material that has fallen from the cliff above the opening, it is essentially an artificial construction. On the east side of the entrance, in front of the rubble accumulation, are the remains of a substantial dry-stone wall. On the inner side of the rubble accumulation, within the entrance zone, there is a slightly raised area composed of shell debris and pebble- to cobble-sized angular basalt clasts. The shells include those of *Littorina spp.*, *Patella vulgata*, *Nucella lapillus* and *Ostrea edulis*. Also visible on the surface of this 'midden' deposit are occasional flint artifacts, rounded pebbles and fragments of bone. In the western half of the chamber is a substantial area of Flandrian (= Holocene) sediments which appear to infill a hollow, or a series of hollows, in the till surface. The south-east corner of the cave contains an area of compacted angular basalt gravel which similarly overlies the till-like sediments.

There were few signs of recent disturbance within the cave. Evidence was found of at least five previous trenches that had been dug into the cave floor (*Figure 2*). The largest and deepest of these is presumed to be that excavated by the Geological Survey, and had been dug to a depth of *ca* 1.80 metres. The other four trenches were relatively shallow features ranging from 40–120cm deep.

Current excavations

The investigation of the cave was approached in three stages. First, a detailed plan of the cave and a contour map of the floor were made. The second stage was to re-excavate the previous trenches and to examine the backfill for artifacts and faunal remains. The Geological Survey's trench was extended to a depth of 3.90m by excavation and hand augering, and the section in the east wall of the trench described and sampled. Stage 3 was to begin a controlled excavation of the deposits in the interior of the cave; attention focused on the area of Flandrian sediments (Area A) and on the outcrop of gravel (Area B). For practical reasons, no attempt was made in 1987 to investigate the 'midden' or other features in the entrance zone. All the material excavated from Areas A and B was sieved through a 3mm mesh using a high pressure cold water spray.

Area A

The Flandrian sediments were examined to a depth of *ca* 60cm. They consist of a well-stratified series of deposits comprising organic- and mineral-rich layers. Faunal material

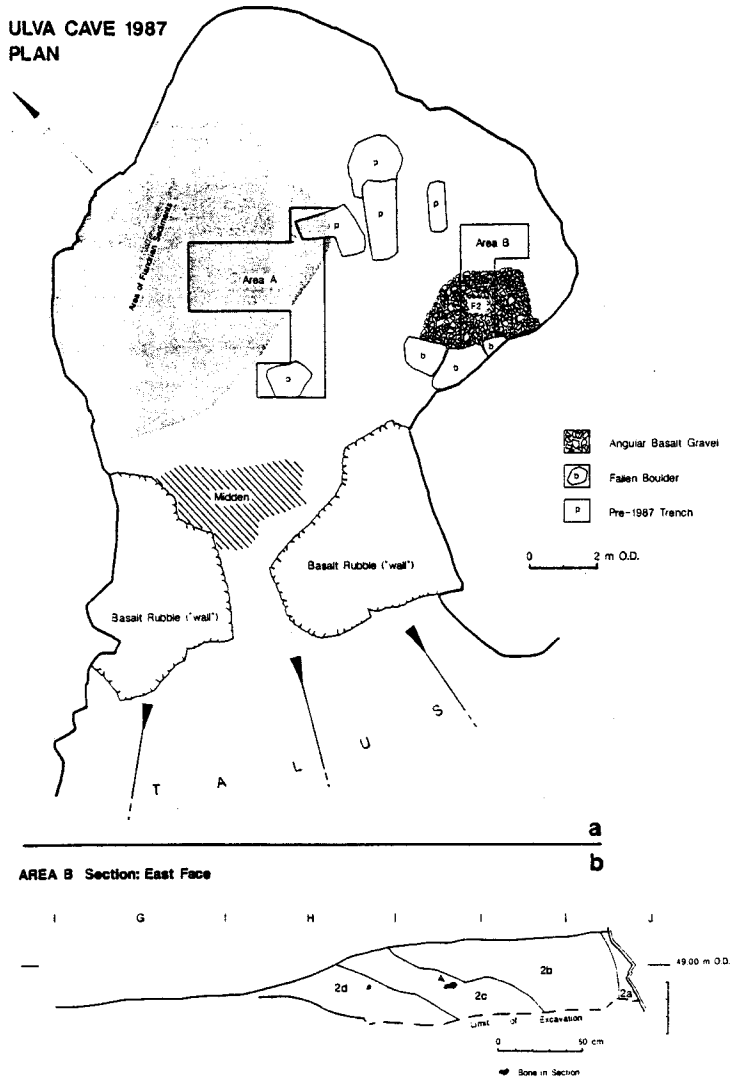

Figure 2: Ulva Cave: *a*. plan of cave floor deposits, and of trenches opened in 1987; *b*. section – southeast face of Area B.

was recovered from most of the strata, and includes the remains of mammals, fish and shellfish. A small quantity of plant remains were also recovered during wet sieving.

Few artifacts have been found so far, but human occupation is clearly indicated by charcoal-rich layers and lenses, the presence of numerous shellfish remains and fish bones, and an apparently artificial concentration of stones overlain by a thick layer of ash.

The time-range represented by these sediments is uncertain at present, but the excavation has produced ample material for radiocarbon dating. Samples were also taken for flotation and pedological analysis.

Area B

A trench, one metre wide, was dug to investigate the relationship between the gravel and the surrounding sediments. The gravel appears to consist of a series of strata dipping towards the south-west wall of the cave (*Figure 2b*, Contexts 2b–2d). The individual layers consist of angular, locally-derived basalt clasts, but differ primarily in terms of colour and the nature of the matrix. There is considerable variation within each layer in terms of the size of the clasts.

The origin and age of the gravel is uncertain at present. It seems improbable that a deposit of this type would have formed inside the cave during the Holocene; on present evidence a Lateglacial (possibly Loch Lomond stadial) age is considered more likely.

At the south-west end of the trench, the gravel is overlain by a thin layer of clay (Context 2a) and by an organic-rich deposit (Context 13 – not recorded in the section shown in *Figure 2b*) containing abundant shell and bone fragments and occasional flint artifacts.

Faunal remains were common throughout the gravel and the overlying deposits. The provisional inventory indicates the presence of bones of amphibians, birds, fish, land mammals (large and small) and seals, and reveals some apparent changes through the sequence (L. Barnetson, pers. comm.). The youngest deposits (Contexts 13, 2a) produced the bones of pig and sheep/goat, as well as the remains of a human infant. In contrast, remains of large mammals recovered from the gravel appear to be exclusively those of deer. The presence of Arctic Lemming (*Dicrostonyx torquatus*) amongst the microfauna from the gravel is consistent with a Lateglacial dating. Absent so far from the faunal inventory are the bones of large carnivores, normally well represented in Pleistocene cave faunas from Britain.

No direct evidence of human occupation in the form of artifacts have been recovered from the gravel so far, but the presence within it of birds, fish and, particularly, seal is of considerable interest.

In the north-east part of Area B the remains of a shallow pit cut into the till-like sediments were found. This feature was only partially excavated in 1987. The character of the infilling, which includes charcoal, shell debris and burnt bone fragments, suggests

that the pit was connected with food-processing activities. No artifacts have been recovered, but radiocarbon dates will be obtained in due course.

Future prospects

In northern Britain sites which preserve thick depositional sequences of late Quaternary age containing evidence of archaeological and environmental significance are extremely rare. The first season of excavation has established the existence within Ulva Cave of a well-stratified series of Holocene and ?Lateglacial sediments containing artifacts, structural evidence, and abundant faunal remains. These deposits have been shown to be underlain by up to 4m (and possibly as much as 10m) of older sediments. The site thus has considerable potential for both archaeological and palaeoenvironmental research. The excellent organic preservation and stratification within the upper part of the sequence offers the prospect of establishing the age, subsistence base and seasonality of successive occupations of the cave during the post-glacial period. Moreover, the earliest deposits within the cave are likely to pre-date the Last Glacial maximum, and may include Middle Devensian stadial and interstadial sediments. The recovery of archaeological remains from these deposits would be of enormous significance for the study of early settlement in northern Britain. The palaeoenvironmental potential of a site such as Ulva Cave has been amply demonstrated by the recent investigation of a high-level sea cave in western Norway (Larsen *et al.* 1987) which preserved evidence of climatic and faunal changes over a time-scale of tens of thousands of years.

Acknowledgements: Many individuals contributed to the success of the first field season on Ulva. In particular, we should like to thank Mrs J.M. Howard for permission to excavate, Lin Barnetson who provided a provisional report on the faunal remains, Bob Bazeley who acted as site supervisor, the student members of the excavation team, and the inhabitants of the Isle of Ulva for their kindness and hospitality. Thanks are also due to the various grant awarding bodies who supported the fieldwork.

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Review

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Clive Bonsall (ed.), **The Mesolithic in Europe: Papers Presented at the Third International Symposium, Edinburgh, 1985**, 645 + xii pp., numerous figures and plates, John Donald, Edinburgh, 1989, £45.

Vermeersch, P.M. & Van Peer, P. (eds), **Contributions to the Mesolithic in Europe: Papers Presented at the Fourth International Symposium, Leuven, 1990**, 474 pp., numerous figures and plates, Leuven University Press, 1990, Bf 2950.

These volumes represent the proceedings of the Third and Fourth International Symposia on the Mesolithic in Europe — the Third organized by Clive Bonsall and held in the University of Edinburgh from the 31st March to the 6th April, 1985; the Fourth organized by Pierre Vermeersch and held in the Catholic University of Leuven, Belgium, from the 17th to the 23rd September, 1990. The idea of a forum dedicated to 'the confrontation of different points of view and to the solution of some problems' among scholars interested in the early Postglacial settlement of Europe was conceived by Stefan Kozłowski of the Department of Archaeology at Warsaw University, who organized the first symposium (with over 30 members) in Warsaw in 1973 and edited the first volume of proceedings. The format was continued at Potsdam five years later, where 62 participants attended the symposium, which was organized and the proceedings edited by a committee led by Bernhard Gramsch of the Potsdam Museum. The third symposium was to have been held in Denmark in 1983, but this had to be abandoned and the venue changed to Edinburgh at a date somewhat later than the established 5-year interval. The Edinburgh meeting had the largest number of participants so far, consisting of 88 scholars from Europe, the United States and Canada, and there were 55 contributors to the Leuven Conference. The number of countries participating in these conferences has also grown since 1973. Eastern Europe, and particularly Poland, has always been well represented, as has Scandinavia, perhaps an indication of the greater Mesolithic research activity in these areas. The greater number of British contributions to the Edinburgh volume is a reflection of expanding interest in the period, but perhaps also of the venue.

The Edinburgh proceedings amount to 62 papers — a large body of material at any time, but even more formidable when some of it had to be translated into English. Earlier symposia papers were published in various languages, the majority in English, followed by German, French and Russian (see table at end of this review). The Edinburgh volume was delayed in publication, hence its appearance here beside the proceedings of the five-years-later Leuven meeting. Many of the Edinburgh authors had the opportunity to incorporate post-conference data into their papers, whereas the Leuven volume was produced before the meeting. It is interesting to see, in the Edinburgh volume, the first

contributions from workers in Norway, Finland, Bulgaria, Spain and Portugal, with further contributions from some of these areas in the Leuven proceedings.

The first ten or so papers in the Edinburgh volume are general studies of aspects of the Mesolithic in wider regions of Europe: the environmental basis, lithic analysis, the use of bows and flint-tipped arrows, bird-foraging patterns, the reconstruction of Mesolithic diets, settlement studies including the use of social space within dwellings, the interpretation of seasonality from shells, Mesolithic faunal assemblages, and social and biological and anatomical aspects of the European Mesolithic population structure. The remaining papers are concerned with various aspects of Mesolithic material culture, economy and society in practically every country in Europe. Two Irish papers discuss the recently established evidence for a Mesolithic presence in the south of Ireland and the faunal remains from two major excavations, restating the possibility that red deer were absent from Ireland in the early Mesolithic period. The Scottish contributions look at the evidence for early post-glacial (pre-9000 BP) settlement, the recent excavations on the island of Rhum, and Mesolithic/Neolithic impact on vegetation. Ten papers were presented by workers in England and Wales, ranging from regional studies of the Mesolithic in the northern Pennines, the Cumbrian coast, the Vale of Pickering, West Wales and the Portland area of Hampshire, to research on the palaeoecology of the North York Moors, a microwear study of the lithics from Star Carr and a re-examination of the fauna from the same site, long blade technology in southern Britain and a Mesolithic flint assemblage from beneath the chambered tomb of Hazleton, Gloucestershire. A study of 94 red deer antler mattocks from Britain includes 17 from Scotland, 11 of which were recovered from excavations on the island of Oronsay.

Two papers consider aspects of the Mesolithic settlement of Belgium and the Netherlands. There is a preliminary report on the excavations at Friesack, near Potsdam in Germany, dating to between 9700 and 7000 BP, a site with remarkable preservation of organic materials, including wooden shafts, handles, a container of bark, and fragments of nets. The contributions from Scandinavia cover settlement and house sites in Denmark and Norway (where Bang-Andersen's discovery of sites above 900m in the Norwegian Highlands must be carefully noted by workers in Scotland), Mesolithic forest clearance in Scandinavia, and the settlements and cemeteries at Skateholm, Scania, Sweden, where a large number of burials were uncovered, with single and double human burials, the position of the bodies and choice of grave goods depending upon age and sex, and a number of dog burials, some separate, some interred with humans. A paper from Finland covers the dating of the Mesolithic in that area. Four papers from the former U.S.S.R. comprise a study of finds of wooden objects preserved in ox-bow peat bogs, including small bows, sledge runners and skis with elk's head carvings dating to between 9000 and 7000 BP, a paper on Mesolithic material culture in the area east of Lake Onega, an inventory of bone and antler artifacts from Latvia, and a survey of earlier Mesolithic cultures in the western part of the Russian Plain. Three papers from Poland examine the procurement of flint on the Polish Plain, the Mesolithic/Neolithic transition in the Polish Lowland, and open-air sites on the North European Plain. The Czechoslovakian contributions discuss the hunting of brown bears in Slovakia, and the excavation of two

semi-subterranean dwellings in Moravia.

South-eastern Europe is represented by studies on flint assemblages from the Bulgarian Black Sea coast, the Epi-Palaeolithic/Neolithic transition on the Lower Danube, the Mesolithic of Serbia and Montenegro, rethinking the Mesolithic of Yugoslavia and Romania, and demographic trends in south-eastern Europe. There is a discussion of the cultural processes involved in the Pleistocene/Holocene transition in southern Italy, and a study of Liguria, 11,000–7000 BP. A paper on the Western Mediterranean studies man–animal relationships in the transition from foraging to food production on some of the Mediterranean islands. The absence of contributions from the Iberian Peninsula in previous symposia is more than compensated for here by the publication of nine papers. Two studies examine the Postglacial environment, settlement and subsistence of the Pyrenees; northern Spain is covered by papers on the transition from Magdalenian to Azilian, the evolution of the Mesolithic, Asturian resource exploitation, and site function and re-evaluation of the Cantabrian Mesolithic; three contributions from Portugal cover spatial organisation of Mesolithic sites in the Muge region, shell-midden sites and their ecological setting in the Sado valley, and the archaeology and human biology of the Mesolithic–Neolithic transition in southern Portugal.

The 40 papers in the Leuven volume come under four headings: 'Ecology, Land Use and Site Structure', 'Physical Anthropology, Burials, Social Issues', 'Cultural Change and Mesolithic/Neolithic Transition' and 'Regional Studies'. They cover many of the same regions as the Edinburgh symposium, in some cases continuing and updating the material presented at the earlier meeting. Particularly interesting is an attempt to assess social complexity from a study of Mesolithic skeletons in Western Europe, and the publication of a database of 413 Mesolithic faunal assemblages from various regions of Europe. There is a preliminary discussion of bone and antler points as possible indicators for 'social territories' in Mesolithic Europe and an examination of the role of the dog burials among the human burials in the Skateholm cemeteries.

These wide-ranging papers give a comprehensive survey of the main trends of research in the 1980s into the settlements, economies, material culture and societies of Postglacial hunter-gatherer communities in Europe. The papers have been prepared by specialists, but these are not publications for specialists only. The general reader who might imagine Mesolithic studies as consisting mainly of lithic typology and pages of drawings of microliths should dip into these studies and be disabused. Substantial advances have already been made in the investigation of Mesolithic population structures and our knowledge of ritual and burial has been greatly expanded by excavations in the past two decades. The interdisciplinary approach is obvious in most of the studies presented and there is something of interest for most students of prehistory. The Edinburgh volume has summaries at the beginning of each paper, but this is unfortunately lacking in the Leuven proceedings. The material is clearly and attractively presented in both volumes, with the human hand still having the edge over computer graphics.

Table 1: Geographical distribution and languages of Mesolithic Symposium papers published since 1973.

Country or Region	*Warsaw 1973* E	F	G	R	*Potsdam 1978* E	F	G	R	*Edinburgh 1985* E	F	G	R	*Leuven 1990* E	F	G	R	*Totals*
Europe General	2	–	–	–	2	–	2	–	2	–	–	–	3	–	–	–	11
Western Europe	–	–	–	–	–	1	–	–	3	–	–	–	1	–	–	–	5
Central Europe	–	–	–	–	1	–	1	–	–	–	–	–	–	–	–	–	2
Eastern Europe	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–	–	1
Northern Europe	–	–	–	–	2	–	2	–	3	–	–	–	–	–	–	–	7
Scandinavia	–	–	–	–	–	–	–	–	–	–	–	–	2	–	–	–	2
Middle Danube	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1
Southeastern Europe	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1
Balkans	–	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–	1
Mediterranean Islands	–	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–	1
Pyrenees	–	–	–	–	–	–	–	–	2	–	–	–	–	–	–	–	2
Iberia	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–	–	1
Belgium	–	–	–	–	1	1	–	–	1	–	–	–	–	–	–	–	3
Britain General	1	–	–	–	1	–	–	–	1	–	–	–	2	–	–	–	6
England	–	–	–	–	1	–	–	–	9	–	–	–	1	–	–	–	11
Wales	–	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–	1
Scotland	–	–	–	–	1	–	–	–	3	–	–	–	1	–	–	–	5
Bulgaria	–	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–	1
Czechoslovakia	–	1	–	–	–	–	3	–	2	–	–	–	–	–	–	–	6
Denmark	1	–	–	–	1	–	–	–	2	–	–	–	3	–	–	–	7
Finland	–	–	–	–	–	–	–	–	1	–	–	–	1	–	–	–	2
France	1	1	–	–	–	1	–	–	1	–	–	–	–	4	–	–	8
Germany	–	–	3	–	–	–	2	–	2	–	–	–	4	–	–	–	11
Ireland	–	–	–	–	1	–	–	–	2	–	–	–	2	–	–	–	5
Italy	–	–	–	–	1	–	–	–	2	–	–	–	–	–	–	–	3
Luxembourg	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–	1
Netherlands	1	–	–	–	–	–	–	–	1	–	–	–	1	–	–	–	3
Norway	–	–	–	–	–	–	–	–	3	–	–	–	2	–	–	–	5
Poland	4	1	2	–	1	–	5	–	3	–	–	–	4	–	2	–	22
Portugal	–	–	–	–	–	–	–	–	3	–	–	–	1	–	–	–	4
Romania	–	–	–	–	–	–	1	–	–	–	–	–	–	1	–	–	2
Spain	–	–	–	–	–	–	–	–	4	–	–	–	–	–	–	–	1
Sweden	2	–	–	–	3	–	–	–	1	–	–	–	1	–	–	–	7
Switzerland	–	–	1	–	–	–	1	–	–	–	–	–	–	–	–	–	2
U.S.S.R.	1	–	3	3	–	–	8	–	4	–	–	–	–	–	1	–	1
Yugoslavia	–	–	–	–	–	–	–	–	3	–	–	–	–	–	–	–	1
	E	F	G	R	E	F	G	R	E	F	G	R	E	F	G	R	
	15	3	9	3	16	3	25		62				31	6	3		
Total Papers	30				44				62				40				
Total Languages	E – 124 F – 12 G – 37 R – 3																

E F G R = English, French, German, Russian