A technological study of selected osseous artifacts from the Upper Palaeolithic of Britain and Belgium

Volume 2

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Thesis submitted for the Degree of Doctor of Philosophy at the University of Oxford

1988

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Chapter 6

The Artifacts: Decorative Objects

Introduction

This chapter contains a description of those objects which have been identified as being primarily decorative. These consist of various kinds of beads, pendants, perforated ivory discs, ivory rings, perforated teeth and shells, incised pieces and representational art. A unique piece of working débris associated with bead manufacture and a double-perforated piece of bone, the age of which is uncertain, are also described here as footnotes to the main text. The various types of working débris which I have identified are also considered in this chapter.

Beads

These are small, deliberately shaped and perforated pieces of bone, antler and particularly ivory, which are believed to have been decorative and designed to be worn. They could have been strung together to form necklaces or bracelets, or they may have been sewn onto garments, either for use as buttons or simply for decoration. Perforated teeth and shells may also have been used for the same functions.

The great majority of the Upper Palaeolithic beads found in the region of this study were discovered in the 'deuxième niveau' at the Grotte de Spy (see De Puydt and Lohest 1886, 17; de Loë and Rahir 1911,11-12; Otte 1979,298; Dewez 1980:40). This layer or series of layers contained a remarkable abundance of pieces of worked ivory, which mainly consisted of what appeared to be beads and pendants and also ivory rods, some of which were interpreted as having been 'blanks' out of which beads of a suitable size and shape could be cut (see Chapter 4: Ivory Rods). This ivory working

industry has been dated to the Aurignacian, owing to the presence of stone tools of that period in the same level or series of levels.

Twelve categories of bead were identified by me as a result of my study of certain British and Belgian Upper Palaeolithic collections, however, this work could not be exhaustive owing to restrictions on time, money and occasionally access. Therefore, the numbers given by me in certain categories will generally be lower than the real totals, although in those cases, supplementary, published information is provided where possible. One category identified by De Puydt and Lohest (1886,19) consisted of three 'ear-shaped' pieces or 'pièces en forme d'oreille' which could not be studied in detail for the reasons outlined above.

A total of seventy-eight beads from three Belgian sites and one British site were identified by me within the twelve categories (see Table 6:1 below): they show a limited range of techniques of manufacture. Traces of deliberate extraction could generally be seen on their sides. Modification has usually been carried out by scraping or incising, though at least one case of working by grinding was recognised. Four possible methods of perforation were identified; they were: by drilling, by scraping, by a combination of scraping and drilling, and by percussion. The area to be perforated had often been reduced, generally by scraping, although in one instance traces of sawing were identified. On certain, better-preserved pieces, the surfaces had received a uniform polish, which was probably a result of manufacture.

These artifacts were examined for possible traces of use, which could only be distinguished on two examples, one a Type g bead and one a Type h bead (see below). The majority of the beads were broken, which it is thought could have happened during manufacture as easily as during use.

A survey of the literature yielded good parallels for the pieces considered here. Similar bead industries to that found at Spy are also

documented at the Aurignacian sites of Abri Castanet (Dordogne) (Peyrony 1935,431-432) and at the nearby site of Abri Blanchard (Dordogne) (Saccasyn della Santa 1946,46; Wymer 1982,248,Fig.72, Nos.12,13,14). Within such collections, both similar types of beads and similar manufacturing techniques have been recognised, for example in the production of beads by cutting out ivory rods, which are then segmented into smaller pieces. Evidence for this method at the Czechoslovakian site of Predmost is also illustrated by Breuil (1924, 535,Fig.16,Nos 1,2). Illustrations of ivory beads from the Ukrainian site of Mezin figured by Boriskovsky (1958,Fig.139) show that the same form of technology was widespread throughout Upper Palaeolithic Europe.

Table 6:1
Categories and Distribution of Beads

Type of Beads	Goyet	Spy	Trou Magrite	Paviland	Total
a Oval beads	4	-	-	1	5
b Bevelled beads	7	11	-	-	18
Type b Blanks	-	22	-	-	22
c Circular beads	-	3	-	-	3
d Oblong-shaped beads	-	3	-	-	3
e Double perforated	-	2	-	-	2
f Pear-shaped beads	-	2	-	-	2
g Scalloped bead	-	1	-	-	1
h Irregular-shaped beads	1	8	-	-	9
i Tooth-shaped bead	-	1	-	-	1
j 'Figure of 8 shaped' beads	1	9	-	-	10
k B-shaped beads	-	-	1	-	1
l Antler bead	1	-	-	-	1
Totals	14	62	1	1	78

Each type of bead will be described below giving information about the methods of manufacture used in their production. Any traces of use will also be documented.

Type a: Oval beads - These are long, oval-shaped, perforated pieces, four examples of which have been identified in Belgium, all at Goyet (numbers

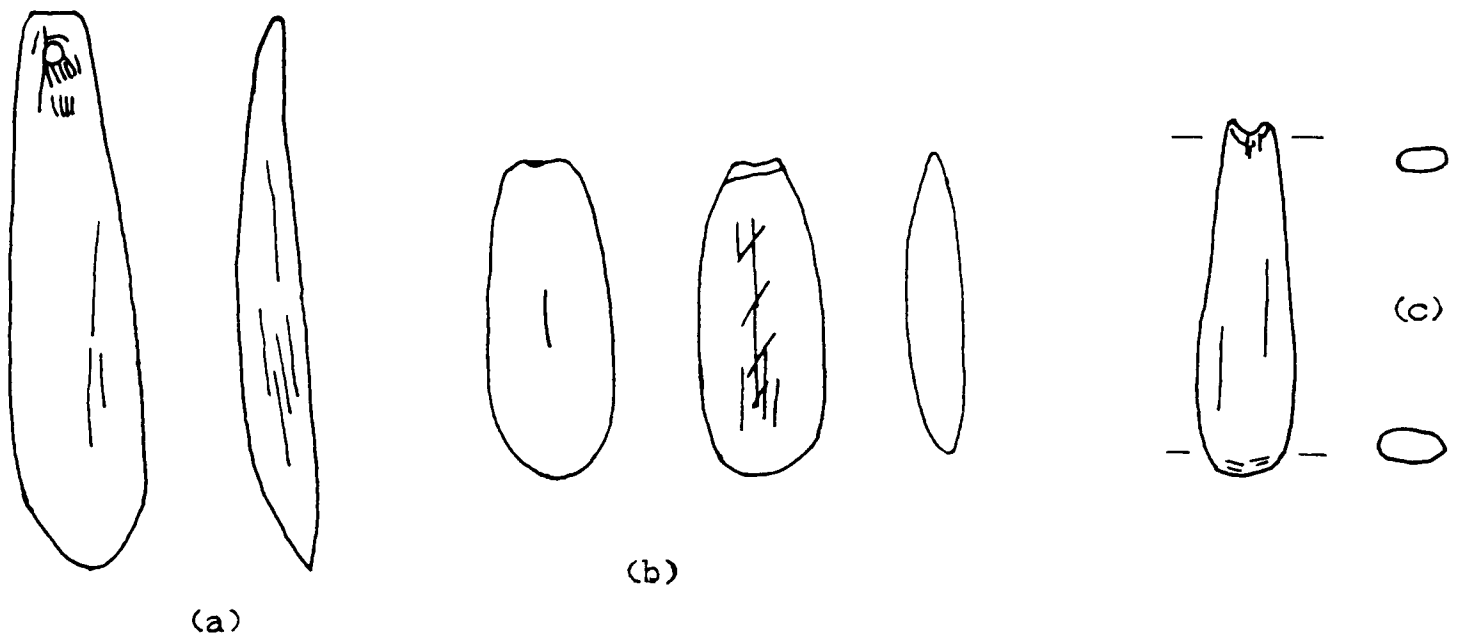


Fig. 6:1 Types a and b beads and blanks for Type b beads:
(a) Goyet 128 (b) Goyet 129 (c) Goyet 2 (d) Goyet 130
(e) Paviland 15 (f) Spy 215 (g) Spy 179 (h) Goyet 113
(i) Goyet 115 (j) Spy 237 (k) Spy 217

2,128,129 and 130). A fragment of what appears to be a longitudinally split Type a bead was also recognised at Paviland (fig.6:1).

Manufacture

Each piece is highly polished, which makes it difficult to identify the raw material from which it was made, as any distinguishing features have been obliterated. However, where these pieces are broken, characteristic features may be identified. Paviland 15 and Goyet 130 are certainly made of ivory, while Goyet 2 and 128 appear to be made of bone. Owing to its heavy polish, it is not clear what raw material Goyet 129 was made from.

(i) Débitage

Probable traces of extraction have been identified on the sides of all the Goyet beads; these take the form of fine, longitudinal striations, regular, longitudinal facets and, on two pieces, little chattermarks. Such signs suggest that these beads were deliberately cut out, probably by the groove and splinter technique, which has been observed on ivory (see Chapter 4:Ivory Rods). Some of these traces could also have been a result of later modification by scraping, given the presence of characteristic chattermarks.

(ii) Modification

Clear striations and facets may be seen on the surfaces of these pieces. Owing to their rounded shapes and the presence of chattermarks on two pieces, it is probable that they were worked by scraping, although the rounded surface of Goyet 129 is particularly highly polished with fine striations running in all directions, which looks more like the results of the experimental replication of grinding than scraping. Each piece is heavily polished all over, which may be a characteristic of manufacture, possibly by rubbing with a fatty substance. All the pieces with surviving perforated ends, that is all the Goyet beads, have been reduced at that

end prior to perforation. Paviland 15 has clearly been broken too far below any such feature for any relevant traces to have been preserved. Both Goyet 128 and Paviland 15 have been coloured pinky-red with ochre; in the case of Paviland perhaps casually, since the area in which the Type a bead was found was heavily coloured with this material; however, in the case of Goyet 128, it could be deliberate colouring of this artifact.

Goyet 2 and 128 have been made bevelled on both surfaces at their perforated ends, as has Goyet 129 to a lesser extent. In the case of Goyet 130, it appears that the end which was intended to be perforated was reduced by sawing all around, so that there is a little ledge round the perforation which is covered with incisions.

All the Goyet beads still show traces of perforation, though only on Goyet 128 has the perforation survived intact. Each perforation seems to have been circular. Goyet 129 has been broken transversely across the perforation, so that only its lower edge was preserved; on that end, traces of a biconical perforation may be seen. Such a perforation would have been produced by making the hole by drilling from both surfaces. The perforation on Goyet 128 has been made in a rather more complex manner: it appears to have been produced by scraping, mainly from one surface. Within this scraped area which is covered with oblique striations, there is a small, circular perforation which suggests that it was finished off and neatened by drilling. A cast was made of Goyet 2 so that its perforation could be inspected microscopically. The inspection confirmed that Goyet 2 has been perforated mainly from one surface by scraping, leaving tiny, longitudinal striations around the perforation, which was finished by drilling, leaving a neat hole. Goyet 129 which had been reduced prior to perforation by sawing all the way round, appeared to have been perforated by scraping out the middle of the lump of ivory left after sawing.

Function

(i) Traces of Use

No traces of use were identified on any of these pieces, though they are all broken, with the exception of Goyet 128, which is just chipped at the perforated end: this damage may result from use. The other three Goyet beads have been broken transversely across the perforation, which, to my mind, is most likely to have happened during the production of the perforation, which by analogy with needles and Type b beads (see relevant categories) was probably the final stage of manufacture. It also seems probable that these pieces would break when dropped or trodden on.

(ii) Use

These pieces were clearly worked with some care to produce such a shiny finish, and their size and shape suggest that they are most likely to have been beads or pendants.

Variation and Distribution

The four pieces from Goyet vary in length from 3.18 to 5.5cm and as they are almost complete, these measurements do provide some indication of the original variation in size of these artifacts. However, the measurements taken across the perforation provide a more reliable indication, in that this little area is complete and the measurements could be made in exactly the same location each time. These pieces vary in width at this point from 0.55 to 0.9cm and in thickness from 0.15 to 0.7cm. Where the dimensions of the perforations could be measured, the length was 0.15cm (taken from Goyet 128 only) and the width ranged from 0.15 to 0.25cm.

Type a beads are at present restricted in their geographical distribution to the two sites of Goyet and Paviland, but as these are both complex, multiperiod sites, the range of the chronological distribution of Type a beads is unknown. One of the Goyet beads, Goyet 2, was found

amongst the spoil (Dierick 1958,80) from old excavations and so no stratigraphical information is available for this piece. Another Goyet bead, Goyet 128, is labelled 'premier niveau', which might suggest a Later Upper Palaeolithic date, but even if the attribution is correct, there was clearly more than one occupation in each of the two layers identified by Dupont. The Paviland bead, being made of ivory, was presumably part of the ivory-working industry at that site, some elements of which, such as the rods and ring fragments. were found in apparent association with the 'Red Lady' skeleton. If another radiocarbon date is obtained for the skeleton (see above), then it might help provide a date for the worked ivory as well. The bead from Paviland, although fragmentary, does seem to resemble the Type a beads sufficiently to be included in this class and thus to extend its geographical distribution considerably. At least occasional examples are known elsewhere; for instance, a very good example of a Type a bead from the Solutrean site of Le Roc-de-Sers (Charente) is illustrated by Müller-Karpe (1966,T123,No.23).

Type b: Bevelled beads - These are short, double-bevelled beads which are perforated through the thinnest part of the piece. They are all made of ivory. Eighteen examples of this type have been identified; seven come from the 'troisième caverne' at Goyet and eleven from the Grotte de Spy (fig.6:1).

Manufacture

(i) Débitage

On account of their repeated, regular shape, it is probable that Type b beads were deliberately cut out of a single piece of ivory as a series, prior to modification. Eight pieces show traces on their edges which are believed to be a result of this process; these traces take the form of longitudinal striations and/or facets. The discoveries made by De Puydt

and Lohest suggested to them (1886,18) that the beads made at Spy were produced by making a series of equidistant, deep incisions in both sides of an ivory rod, in order to produce a number of pieces of the same size. This was proved by the discovery of a

> "lamelle d'ivoire brisée très mince, longue de 50 mill., formée de quatre petits ornements plus ou moins ovale" (1886,18).

This piece is reproduced here (fig. 4:18). The same technique was clearly practised at the Abri Blanchard (Dordogne) on both ivory and reindeer antler and is illustrated by Sollas (1915,308,Fig.146,a,b,c,d,e); further evidence for this type of ivory working was also found at the Abri Castanet (Dordogne) (Peyrony 1935,431-432) and at Predmost in Czechoslovakia (Breuil 1924, 535, Fig. 16, Nos 1,2). What appear to be similar remains from Mezin in the Ukraine are illustrated by Müller-Karpe (1966,T245,19-21). The examples quoted here suggest that this technique was widely used in Europe and the Soviet Union.

(ii) Modification

These beads have been scraped, so as to make them steeply double bevelled at one end and rounded at the other. Typical traces of this process include incisions, longitudinal and oblique striations and facets. On Spy 179 and Goyet 112, little transverse 'steps' may be seen in the ivory, where the stone tool has dug into its surface. It is thought that these pieces were made to be double-bevelled, in order to make the ivory thinner and thus, easier to perforate. These beads may once have been polished, but they are all now in a rather decayed condition.

Five examples have been perforated by drilling from both surfaces, leaving some transverse incisions within the perforation on Spy 267. Eight beads were perforated from both surfaces, first by scraping and then by rotation, so that some striations could be seen at both ends of the

perforation. Variations on this theme include Spy 292, which was in the process of being perforated by both scraping and rotation from one surface, while Goyet 117 appeared to have been perforated by scraping from both surfaces, however, it was broken obliquely across the perforation, so that other traces of working may not have survived. Spy 261 shows at least the start of a perforation on both surfaces, but as sediment covers much of both indentations, it is impossible to tell what method of perforation was used. Little information could be derived from Goyet 118, which was in a fragmentary condition, while the necessary information was not recorded for Spy 291. Where it was possible to tell, most of the perforations appeared to be circular.

Function

(i) Traces of Use

Most of these pieces were either chipped or broken, usually across the perforation. Such damage may have been related to use; this hypothesis may be to some extent supported by the fact that the three undamaged pieces are all unfinished. However, it is equally possible that some of these pieces broke during manufacture, perhaps when being perforated. One possible example is Goyet 117 which is particularly tiny.

(ii) Use

If these pieces were worn as beads or pendants, I think that all the wear that they would show might be where a thong has rubbed against the inside and upper edges of the perforation, but that the beads would be unlikely to break when strung, unless some added stress was placed on them, for example by regular playing with or pulling at the beads. It is more likely that the thread with which they were strung might snap and the beads fall to the ground and be crushed underfoot. Another way in which these beads could have been worn would be as buttons, which would also have put them under some added stress through twisting. The beads could

also have been used to trim clothing for added decoration, and like perforated shells and teeth, they have been found with human burials, arranged in such a way, for example in rows across the body and round the forehead, as to suggest that they had been sewn onto the garments in which the body was buried, for example at Soungir, in the Soviet Union (Wymer 1982,249).

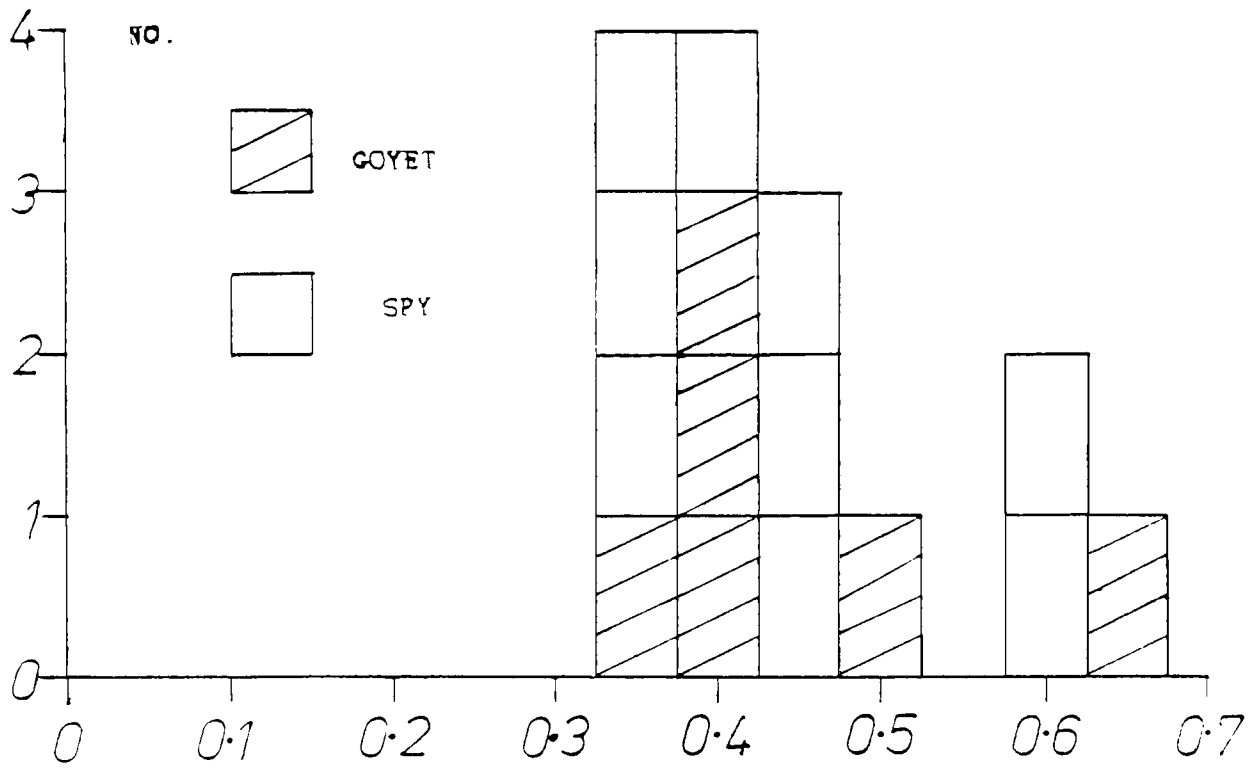
Variation and Distribution

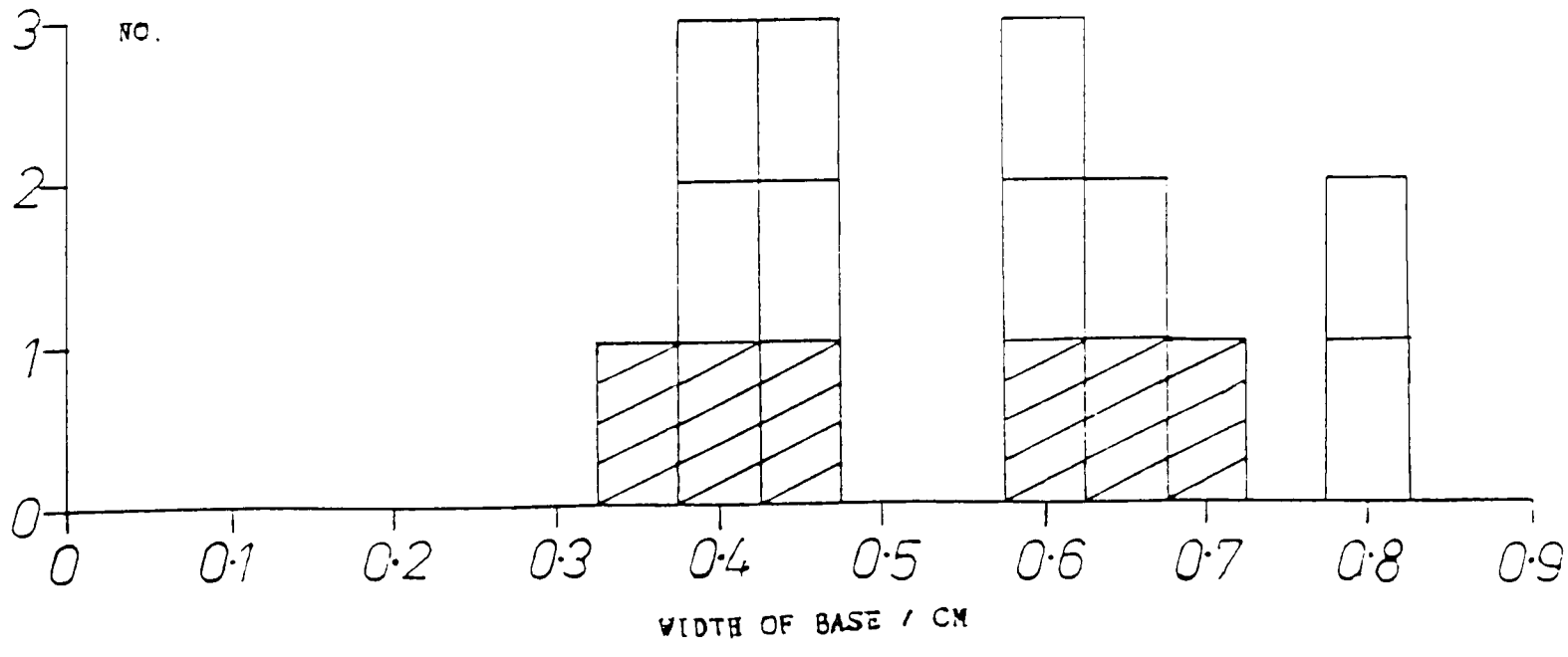
Most of these pieces are broken, but their range in length gives some indication of their size; they vary from 0.6 to 1.45cm in length. Where it could be measured, the bevelled area varied in width from 0.35 to 0.8cm and in thickness from 0.15 to 0.3cm, and the base from 0.35 to 0.8cm in width and 0.35 to 0.65 in thickness. As may be seen on Graph 6:1, the range of variation is very much the same for beads from both Spy and Goyet. On those pieces where the dimensions of the perforation could be measured, they could be seen to vary in length from 0.1 to 0.35cm and in width from 0.1 to 0.4cm.

All the Type b beads are found on only two Belgian sites; they are the 'troisième caverne' at Goyet and the Grotte de Spy. It is possible that the Goyet examples have in fact been brought in the approximately twenty kilometres from the latter site as it, unlike Goyet, has a substantial ivory-working industry and furthermore, a large number of unfinished Type b beads have been found at Spy, while I have seen none from Goyet. This suggestion is made tentatively, because I was not able to inspect all the collections of osseous artifacts from Goyet, some of which are in private hands.

All of the Type b beads from Spy are thought to have come from the 'deuxième niveau', which contained an Aurignacian stone industry as well as a great abundance of worked ivory. Owing to the very close resemblance

Graph 6:1 Distributions of base thickness and width for Type b beads





of the Goyet Type b beads to those from Spy, the former have been attributed to the Aurignacian (Otte 1979,419). Similar pieces are certainly known from Aurignacian contexts in South West France; they include examples made of reindeer antler, which were recovered from the Abri Blanchard in the Dordogne (Saccasyn della Santa 1946,49) and ivory Type b beads from the site of Abri Castanet (Dordogne) (Peyrony 1935,431,Fig.14).

Type b blanks

All of the Type b bead blanks which had not yet been perforated came from the Grotte de Spy, which supports the view expressed above that such pieces may have been solely made at Spy and transported to Goyet and possibly other sites. Like those beads described above, they were all made of ivory. Twenty-two examples of this type have been recognised, although only five could be considered in detail, in the time available to me (fig.6:1).

Manufacture

(i) Débitage

Clear traces of cutting out could be seen on the sides of the five pieces studied in detail; these took the form of regular, longitudinal striations, as well as facets in two cases. On all five pieces, the non-bevelled end, which is neatly rounded on the completed Type b beads can be seen to have been roughly worked by scraping from all surfaces and snapped off. Spy 238 looked as if the same process was being very crudely carried out at the bevelled end as well.

(ii) Modification

Each blank had been worked by scraping, resulting in such traces as longitudinal striations, facets and tiny chattermarks in one case. Four beads have been made double-bevelled at one end, while Spy 250 has only a

slight bevel on one surface. The other seventeen pieces were all double-bevelled at one end and appear to have been produced in the same fashion as those described in detail. All of these Type b bead blanks were quite corroded.

Variation and Distribution

The five pieces studied in detail appeared to be generally complete and ranged in length from 1.5 to 2.2cm, in width from 0.5 to 0.65cm, in thickness at the rounded end from 0.4 to 0.72cm and at the bevelled end from 0.15 to 0.35cm. The majority of the other Type b bead blanks were just under or equal to 1cm in length.

Like the finished beads, all of these pieces of worked ivory are believed to have come from the 'deuxième niveau' at Spy and, thus, to have been of Aurignacian date. The pieces studied here constitute only a small sample of the great number of pieces of this nature found at the Grotte de Spy by the many different excavators, which may again suggest that pieces of this type were regularly manufactured at Spy and sent to Goyet and doubtless elewhere. However, this hypothesis may be the result of a bias in the collections made by the various excavators and curators, and in those studied by me.

Type c: Circular beads - Only three circular beads have been identified among the collections studied here. They are all made of ivory and come from the Grotte de Spy. Only Spy 239 is complete; the other two beads have been broken in half and are now in fact semicircular in shape, although they were clearly originally circular (fig.6:2).

Manufacture

(i) Débitage

No traces of extraction could be seen on Spy 259, but on the other two beads, longitudinal facets and in one case, longitudinal striations could



Fig. 6:2 Types c, d, e, f, g and h beads:
(a) Spy 205 (b) Spy 239 (c) Spy 225 (d) Spy 12
(e) Spy 224 (f) Spy 209 (g) Spy 213 (h) Spy 218
(i) Spy 204 (j) Spy 88 (k) Spy 187 (l) Goyet 120

be seen round the edges, although these traces could also be associated with modification.

(ii) Modification

Few traces of modification could be distinguished, mainly because these pieces are quite corroded; they include four deep incisions on one surface of Spy 239, longitudinal facets to each side of the perforation on Spy 259 and longitudinal facetting with a few longitudinal striations on Spy 205. The irregular surfaces of these pieces and their small size suggest that they were worked by scraping.

Spy 259 has a subcircular perforation with a biconical profile, which clearly shows that it was produced by drilling from both surfaces. Spy 205 was probably perforated in the same manner to produce a circular hole, but this area is unfortunately coated with sediment so that it is impossible to be certain. It is also not entirely clear whether Spy 239 was actually perforated, for the relevant areas are thickly coated with sediment, though a number of little incisions may be seen (see above) which may have been associated with perforation.

Function

(i) Traces of Use

Two of these pieces were broken and one was chipped; apart from this damage, no possible traces of use were identified.

(ii) Use

Like the Type b beads, these pieces may have been intended, when complete, to be strung and worn as beads or pendants, but as was discussed above, this form of use is unlikely to have led to such substantial damage. They could also have been designed for use as buttons.

Variation and Distribution

What remains of these beads suggests that they varied in diameter from 0.8 to 1cm; while the perforations ranged in diameter from 0.3 to 0.4cm.

All three pieces are thought (Otte 1979,302) to have come from the 'deuxième niveau' at the Grotte de Spy and we may reasonably suppose, if so, that they, therefore, formed part of the massive ivory-working industry found in that 'level' which is attributed to the Aurignacian. Similar pieces made of both reindeer antler and ivory were found at the Abri Blanchard in the Dordogne (Sollas 1915,308,Fig.146,g; Saccasyn della Santa 1946,46). A series of what appear to have been three adjoining, unfinished, circular, ivory beads is illustrated by Breuil (1924,Fig.15,5), which reveals again the method of bead production whereby a rod of ivory is cut out and is then carefully worked into a number of segments of the required size and shape, each of which is then perforated prior to being snapped off. The Spy examples may also have been produced this way, although only the individual, perforated segments have been identified by me.

Type d: Oblong-shaped beads - Three oblong-shaped beads made of ivory were identified by me amongst the collections which I studied; they all came from the Grotte de Spy (fig.6:2).

Manufacture

(i) Débitage

The regular shape of these pieces and the longitudinal striations and facets on their sides suggest that they were deliberately extracted by the groove and splinter technique.

(ii) Modification

On both surfaces of Spy 12, there are irregular, longitudinal striations, which look as if they are associated with scraping. Similarly, there are some longitudinal striations visible on both surfaces of Spy 225, which again look like the products of scraping. Both surfaces of Spy

13 are corroded, but near to the perforation on one surface, some longitudinal facets and striations may be seen.

Spy 225 was perforated by drilling from both surfaces; clear traces of this process survive on the now broken perforation, which was probably circular. Spy 13 also seems to have been perforated by drilling, though mainly from one surface; it again has been broken across its probably circular perforation. By contrast, Spy 12 is unfinished, for its perforation consists of two approximately circular, matching depressions, one on each surface, made roughly by rotation.

Function

(i) Traces of Use

No traces of use were identified, but each piece was broken at both ends, in two cases across the perforation, while Spy 12 is thought to be unfinished in any case, and so would not have been used.

(ii) Use

These pieces may once have been pendants or beads and, as was discussed above, these functions are unlikely to lead directly to this sort of breakage. These artifacts could also have been buttons.

Variation and Distribution

As all these beads are broken and it is not clear how much material is lost, their present lengths can give little indication of the original variation in size of these pieces. Their dimensions taken either across or just below the perforation may be more representative; their widths range from 0.7 to 0.95cm and their thickness from 0.3 to 0.55cm. In the case of Spy 12, both dimensions of its unfinished perforation could be measured; its length was 0.3cm and its width 0.25cm.

All three Type d beads probably came from the 'deuxième niveau' at the Grotte de Spy, judging from their close resemblance to other pieces of worked ivory assigned to this level. They are, therefore, thought to be

part of the Aurignacian industry at the site. Some possible parallels for these pieces which I have seen illustrated are the 'semi-rings' of ivory described and illustrated by Peyrony (1935,433,Fig.16), which were believed by him to have been perforated at both ends, although no complete pieces with both ends intact have been found (Leroy-Prost 1975,149). A fragment of such an end might resemble the beads described above, but for the fact that they would not lie flat, because they are curved. Peyrony (op.cit.,434) suggested that such a piece could have been part of a hair band tied with thread through the perforations. This seems a little unlikely, but as yet no agreement has been reached upon the function of these unusual artifacts. A better comparison for the Type d beads is provided by a piece from the Solutrean site of Le Roc-de-Sers (Charente) which is illustrated by Müller-Karpe (1966,T123,17), and which appears to be only perforated at one end.

Type e: Double-perforated beads - There were two double-perforated, ivory beads amongst the material I studied, one of which, Spy 224, has rounded edges, while Spy 209 has edges which curve inwards. These two beads from the Grotte de Spy were the only examples of this type to be recognised by me (fig.6:2).

Manufacture

(i) Débitage

Both Type e beads have been deliberately cut out, because longitudinal striations and facets are visible on their sides, though some of these traces may be associated with later modification, particularly in the case of Spy 209.

(ii) Modification

Spy 209 has longitudinal striations on both surfaces, which are most probably associated with scraping; certainly, the inward curve of the

edges must have been produced this way. This area is covered with little, transverse 'steps' where the stone tool has cut into the ivory. Some longitudinal striations may be seen on one surface of Spy 224, which are probably associated with scraping, as this is such a small piece. Both artifacts have been broken at each end across a perforation, which, in all four cases, appears to have been made by drilling from both surfaces. It is probable from what has survived of these perforations that they were originally circular. I have assumed that the basic shape of the bead is complete, though it must be admitted that this cannot really be demonstrated.

Function

(i) Traces of Use

No traces of use were identified on either of these pieces; it is possible, though not in my view very likely, that they broke during use. However, it may be that they were not used, but were intended to be divided into single beads.

(ii) Use

These artifacts may have been ornamental and worn as beads or pendants, or as some form of 'spacer-plate' linking two strings of beads; they may also have been sewn onto garments as brooches or trimmings, or they may have been used as buttons. It seems unlikely that any substantial damage may have occurred as a result of use in any of the ways listed above.

Variation and Distribution

As both beads are incomplete, their present lengths provide little evidence for their original sizes. However, their other dimensions are more representative of their original size: Spy 209 and 224 are 0.8 and 0.95cm wide and 0.35 and 0.3cm thick respectively. The approximate widths

of the perforations are as follows; the holes in Spy 209 appeared to be 0.2 and 0.25cm wide, as did those on Spy 224.

Both Type e beads probably came from the same ivory industry in the 'deuxième niveau' at the Grotte de Spy, which has been attributed to the Aurignacian. Comparable pieces made of jet, which were found at the Magdalenian site of Petersfels in Germany are illustrated by Müller-Karpe (1966,303-304,T193,Nos.23,25,26,27,31).

Type f: Pear-shaped beads - One unfinished, pear-shaped, ivory bead, Spy 213, was identified among the collections considered here. A possible second example, Spy 218, was also recognised, though it may be that it was just a corroded, broken deer canine, which has the same profile as Spy 213 (fig.6:2).

Manufacture

(i) Débitage

Spy 213 does appear to have been deliberately cut out, because around the edges, some longitudinal and oblique striations, and also chattermarks may be seen, though it is possible that these traces came about through modification. No such traces were recognised on Spy 218.

(ii) Modification

Spy 213 is so rounded on one surface that it must have been shaped by scraping; some oblique striations are visible on that surface. No traces are visible on the flat surface, which appears to have been longitudinally split: this is a natural feature of slightly decayed ivory. A few possible oblique striations may be distinguished on Spy 218, but it is so corroded that it is impossible to be certain.

Spy 213 was in the process of being perforated by drilling from both surfaces, but the hole is unfinished and consists of one indentation 0.1 to 0.15cm deep on each surface, though one of them was once deeper, as

some material has been longitudinally split from the flat surface. The rounded surface appears to have been prepared for perforation by scraping to make the piece thinner at that point. Little oblique striations may be seen within the indentations. The perforation looks circular on the rounded surface and pear-shaped on the flat surface.

By contrast, Spy 218 has been broken obliquely; although no definitive traces survive, this was possibly across a perforation, which, if it did exist, was presumably made by percussion, which has caused a longitudinal split down the piece.

Function

(i) Traces of Use

No traces of use were identified on either piece and indeed, Spy 213 was actually unfinished.

(ii) Use

As regards Spy 218, it could be just a corroded deer canine and possibly an unworked one at that. Spy 213, however, is a genuinely worked piece of ivory which was in the process of being perforated. From its size, it is likely to have been intended to be a pendant, possibly a charm or an amulet, rather than a bead from a necklace.

Variation and Distribution

These pieces are 3 and 2.3cm long, but, as they are both incomplete, their original lengths are unknown. Across the perforation, assuming that Spy 218 was indeed perforated, they are 1.1 and 1cm wide and 0.55 and 0.3cm thick respectively. The perforation on Spy 213 seemed to be 0.5cm long and 0.6cm wide when observed from the flat surface and 0.5cm long and 0.45cm wide, when seen on the rounded surface.

Both pieces come from the Grotte de Spy and probably from the 'deuxième niveau', from which as we have already seen an abundance of

ivory beads was recovered. A survey of the published sources failed to reveal any comparable pieces.

Type g: Scalloped beads - This type consists of flat, scalloped pieces of ivory, of which only one example, Spy 204, has been identified (fig.6:2), but it is thought to be sufficiently different from the other beads to merit this extra grouping.

Manufacture

(i) Débitage

This piece appears to have been deliberately cut out, owing to the presence of longitudinal facets on the one complete, non-scalloped edge.

(ii) Modification

The shaping of the sides must have been carried out by scraping, but only a few traces of modification are visible; a few striations may be seen on the surfaces.

In the middle of this piece, there is a subcircular perforation, which has been roughly made by drilling from both surfaces. The perforation is 0.15cm long and wide.

Function

(i) Traces of Use

Traces of use were identified in the form of wear on the lower, left part of the perforation on both surfaces, which may have resulted from rubbing against a thong or a string. This piece has been broken obliquely across one end.

(ii) Use

This piece is most likely to have been used as a bead, or a pendant, or even as a button, and so the wear could have occurred through the ivory rubbing against the thong or the string either from which it was suspended, or by which it was sewn onto a garment. It is unlikely that

the breakage resulted from this form of use, and it is perhaps worth noting that the perforation remains intact in spite of the wear it suffered.

Variation and Distribution

This object is 1.15cm long, but as it is broken, its original length is unknown. Its maximum width is 1cm and its thickness 0.3cm. It was found at the Grotte de Spy and although no exact details of its provenance were recorded it seems likely to have been part of theivory-working industry found at the site, which is attributed to the Aurignacian. A complete circular scalloped ivory bead from Spy was figured by Otte (1979,299,Fig.123,No.35). A similar scalloped effect is achieved on an Aurignacian pendant made from a notched stone ring from Bockstein-Törle, Germany, which is figured by Hahn (1972,255,Fig.7,No.6).

Type h: Irregular-shaped beads - These are flat, irregular-shaped, ivory beads; nine examples of which have been identified (fig.6:2). Their number and distribution are given in Table 6:2 below:

Table 6:2
Number and Distribution of Type h Beads

Site Name	Subcircular	Suboval	Subsemi-circular
Spy	5	2	1
Goyet	-	1	-

Manufacture

(i) Débitage

Two pieces were so corroded that no traces which could be linked to débitage were identified. However, probable signs of extraction by the groove and splinter technique could be seen on the sides of the other seven pieces in the form of longitudinal striations and/or facets, three of these beads also have chattermarks on their sides which may be associated with vigorous scraping.

(ii) Modification

There is clear evidence for the modification of the surfaces of some of these pieces by scraping, for example Spy 187 is covered with oblique and curving, longitudinal striations on one surface, which closely resemble the results of scraping which I produced experimentally. Similar grouped longitudinal and oblique striations were observed on both surfaces of Spy 88. The better preserved surface of Goyet 120 showed lots of very fine, mainly oblique striations and was polished. When a silicone rubber cast of this surface was examined by me in an SEM, it revealed what looked like a typical scraped surface with grouped striations cut by little transverse features, which show where the stone tool has cut into the surface (Plate 6:1). Only a few striations or incisions were preserved on the other beads in this category, but their small size and irregular shape suggest that they were also worked by scraping.

There is no doubt that seven of these beads were perforated, but as the other two, Spy 240 and 241, were coated with sediment, it is impossible to be certain whether they were or not. All the visible perforations are roughly circular. Four examples were made from both surfaces by drilling and in one case, Spy 33, the perforation is still slightly biconical. The perforation on Spy 22 had been made from both surfaces, first by scraping, then by drilling and is also slightly biconical in profile. The perforation on Spy 24 was started on one surface by incising and scraping, then was continued from both surfaces by drilling and was subsequently neatened to produce a cylindrical perforation. Unfortunately, there is a coating of sediment on what survives of the perforation on Goyet 120, for this piece was broken obliquely across the perforation. What remains is rather ambiguous, because there are traces of the perforation on one surface but not on the other; this suggests that either the perforation was in the process of

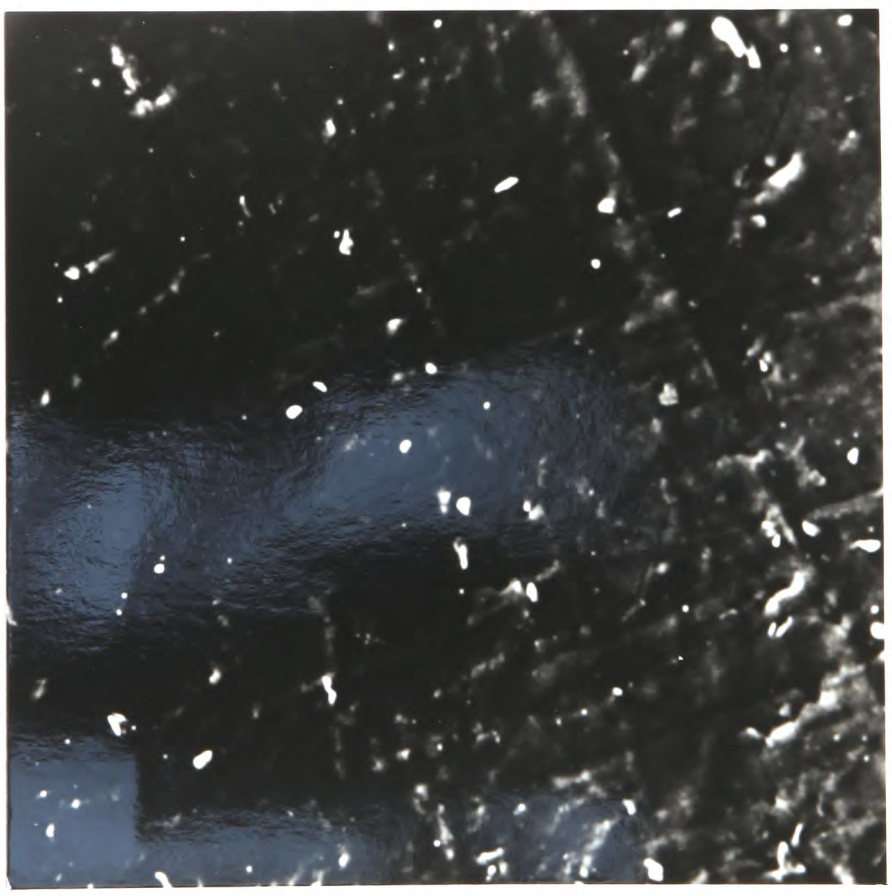


Plate 6:1 Traces of modification on one surface of Goyet 120 (x90) (SEM photograph)

being made from one surface only when it broke, or else it was fully perforated, but that the perforation was worked lower down on one surface than on the other and that they joined further up.

Function

(i) Traces of Use

Possible traces of use in the form of wear were identified on opposite surfaces of the perforation on Spy 187, though the significance of this is unclear. Goyet 120 was broken across the perforation, but this could have happened during manufacture as easily as during use.

(ii) Use

It is probable that these pieces were worn as beads, pendants or buttons. The wear observed on Spy 187 may have come about through rubbing against a thread or thong, possibly when strung as a bead, or if this piece were sewn onto a garment as a button. The breakage of Goyet 120 across the the perforation is more likely to have occurred during manufacture than through use.

Variation and Distribution

The seven beads which appear to be complete vary in length from 1.1 to 1.6cm, in width from 0.9 to 1.8cm and in thickness from 0.25 to 0.5cm. Where the perforations could be measured, their dimensions ranged in width from 0.4 to 0.15cm and in length also from 0.4 to 0.15.

Type h beads are restricted in their distribution to the Grotte de Spy and the 'troisième caverne' at Goyet. The bead from Goyet is labelled 'deuxième niveau', which may indicate an Earlier Upper Palaeolithic date, assuming that this attribution is correct. The majority of these beads come from the Grotte de Spy and are probably yet another component of the remarkable ivory industry at that site, which as we have seen appears to belong to the Aurignacian. I noted with interest that similar pieces from Mezin in the Soviet Union are figured by Müller-Karpe (1966,T245,Nos.29-

34). Further published comparable pieces include examples from the Aurignacian at Wildscheuer and Bockstein-Törle in Germany (Hahn 1972,255,Fig.7,Nos.1-5). A very similar example to Spy 187 which was found at Le Roc-de-Sers (Charente) is figured by Müller-Karpe (1966,T123,No.14).

Type i: Tooth-shaped beads - This category consists of only one example, Spy 25, which is a mammoth ivory bead which has been constructed to look like a tooth, and like a fox canine in particular (fig.6:3). This is the type of tooth which is most frequently found to be artificially perforated. Similar examples have been found both in the Belgian Upper Palaeolithic and elsewhere in Europe.

Manufacture

(i) Débitage

No evidence for débitage was identified, but it is likely that any signs of this process would have been obliterated by the extensive traces of modification on this piece.

(ii) Modification

Spy 25 is almost completely covered with longitudinal facets and chattermarks, which indicate that it was worked by scraping. Its small and irregular shape suggests that it is unlikely to have been modified by grinding. Spy 25 has a circular perforation, which had been made by drilling from both surfaces. Clear traces of this process still survive.

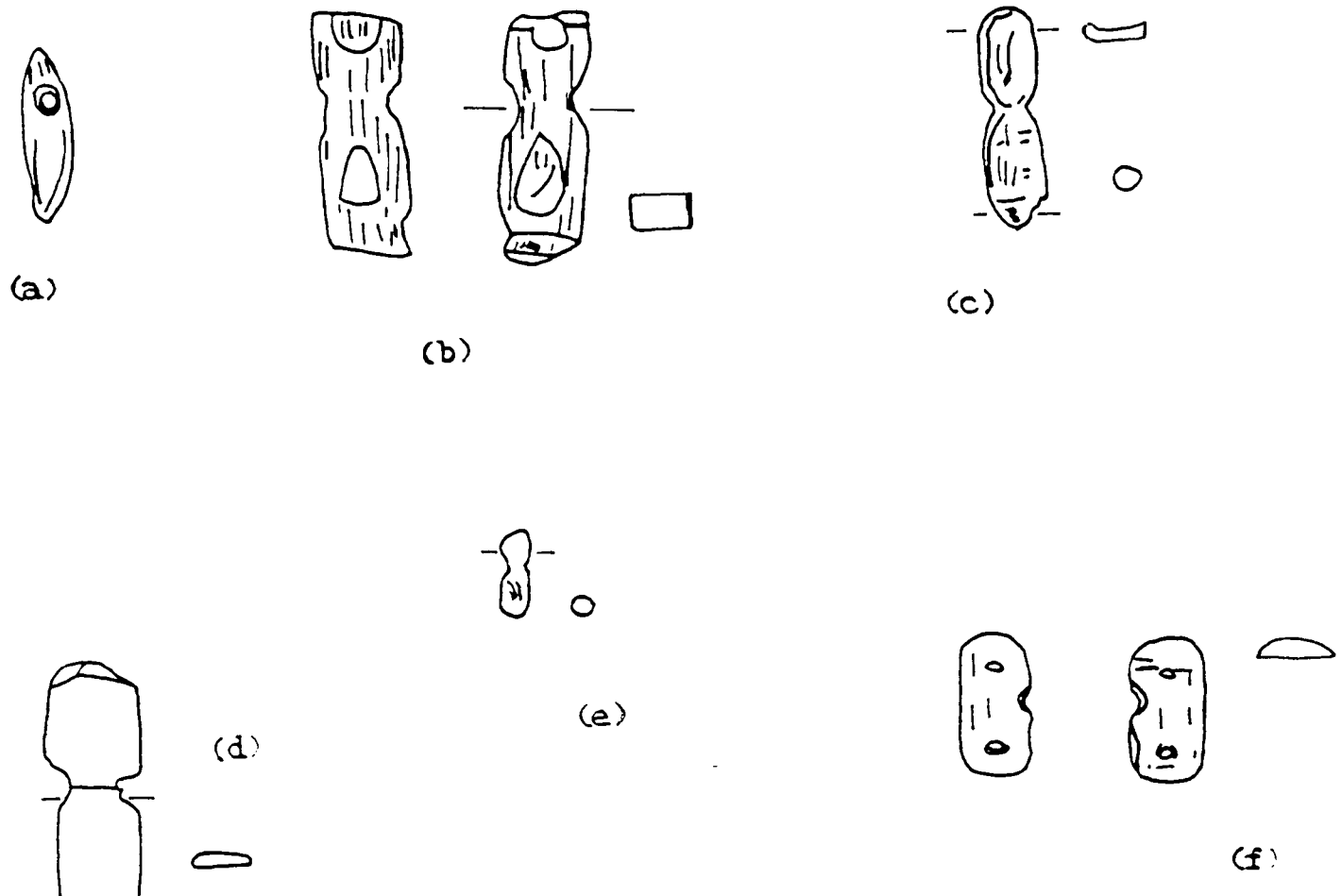
Function

(i) Traces of Use

No traces of use were identified on this piece, which was in a good condition with regard to the preservation of traces of working.

(ii) Use

It is probable that Spy 25 was perforated for suspension, possibly as some form of amulet or charm, given that it is a representation of a tooth



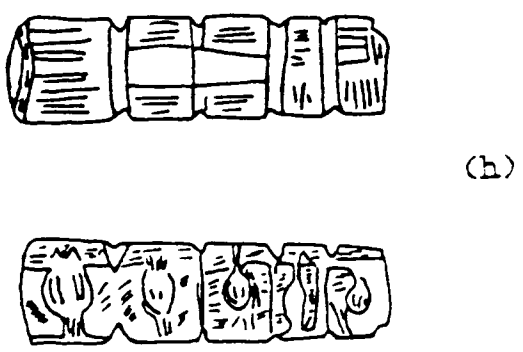


Fig. 6:3 Types i, j, k and l beads and Goyet 122:
(a) Spy 25 (b) Spy 89 (c) Spy 66 (d) Spy 29
(e) Goyet 119 (f) Magrite 72 (g) Goyet 34
(h) Goyet 122

in another medium, that is ivory. There is also evidence from Upper Palaeolithic and Mesolithic burials to suggest that perforated teeth were used in large numbers to trim garments (see Perforated Teeth).

Variation and Distribution

Spy 25 is 1.8cm long, 0.5cm wide and 0.2cm thick across the perforation. The dimensions of the perforations were 0.15 by 0.15cm. These dimensions are comparable with those for actual perforated fox canines. This piece may be part of the Aurignacian ivory working industry found at the Grotte de Spy. Two similar artifacts, (copying deer teeth), one from Goyet and one from the Grotte du Prince have been identified by Otte,

> "à la grotte du Prince à Marche-les-Dames, une pendeloque en ivoire portant trois incisions cruciformes semble imiter la forme d'une croche de cerf. Une pièce semblable mais où l'imitation de la dent apparaît beaucoup mieux a été retrouvée à Goyet" (1979,594-595).

The existence of ivory copies of teeth at the Grotte du Mammouth in Poland is recorded by Déchelette (1934,210).

Type j: 'Figure of 8-shaped' beads - This category consists of 'figure of 8-shaped' double beads made of ivory. Ten examples of this type have been recognised among the collections studied here; nine type j beads come from the Grotte de Spy and one from Goyet (fig.6:3).

Manufacture

(i) Débitage

No traces of débitage were identified on Goyet 119, but its regular shape strongly suggests that it was deliberately cut out. In any case, another six examples of this type show probable traces of this process on their sides, in the form of longitudinal striations, facets and in some cases, chattermarks. One of these beads, Spy 89, has also clearly been sawn and snapped off at one end. What has survived of this process

suggests that Spy 89 had just been removed from a piece of ivory shaped to yield a whole series of such pieces. A further two examples, Spy 16 and 17, were probably also carefully cut out in view of their particularly regular shapes but, as they are worked all over, traces of débitage have been obliterated. Spy 66 was probably cut out, for at one end, there are traces of transverse sawing in the form of deep grooves. A number of transverse incisions may also be seen on the sides of this piece, which may have been markers made to indicate where deep, transverse grooves were to be made in the sides, in the manner described below.

(ii) Modification

Some of the following traces, that is longitudinal and oblique striations and facets could be seen on all these beads, which are interpreted as resulting from scraping of the surfaces. This is supported by the fact that a stone tool must have been used to make the deep incisions in the sides of these pieces, in order to produce the 'waisted' effect (see fig.6:3). Traces of scraping may be seen in this area in each case, as well as little, transverse steps on Spy 201, where the stone tool has cut into the surface.

Spy 66 was very smooth, which was probably a result of careful working. Spy 89 showed a particularly interesting feature of manufacture, that is preparations for perforation in the form of two scooped-out areas on each surface, made by scraping (fig.6:3).

Function

(i) Traces of Use

No potential traces of use were identified on any of these beads. If they were all intended to be perforated (see below), that would imply that they are all unfinished and hence unused.

(ii) Use

The presence of the scooped-out areas on Spy 89 suggests that these pieces were intended to be perforated, to form beads such as Types b, c, e, or even g, and h beads. They need not all have shared the same eventual shape, for the Type j beads considered here vary greatly in cross-section from oblong, such as Spy 29, to curved, such as Spy 66 and subcircular, such as Goyet 119 and Spy 201. These last two examples may have merely been split in two to form the little spheres of ivory dicussed below.

These pieces may have come from a long rod of ivory which was 'waisted' at regular intervals (see Type b beads). If these pieces were intended to be split into individual beads, then it seems curious that they are found so frequently in pairs; this suggests that they may have had some function in this paired form, either in a perforated or an unperforated state. Dewez indicated that they could indeed have been used as ornamental objects in this form,

> "mais peut-être était-il employé tel que comme objet de parure, l'étranglement étant destiné à la suspension" (1960,23).

They could also have been very effectively used as buttons or toggles. Indeed, Saccasyn della Santa claimed to be able to distinguish traces of use on these pieces, which was not the case when I looked at them forty years later,

> "à Spy et à Goyet les perles jumelles présentent des traces d'usure et un certain degré de polissage, non seulement sur leur surface mais dans la rainure même qui constitue la gorge" (1946,47).

Variation and Distribution

All of these pieces, with the exception of Spy 89, appear to be in an unbroken, although probably unfinished state. The examples from Spy range in length from 1.45 to 2.7cm, in width from 0.55 to 1.1cm, and in

thickness from 0.3 to 0.65cm. Across the 'waist', these pieces vary in width from 0.4 to 0.7cm and in thickness from 0.3 to 0.65cm. The bead from Goyet is considerably smaller, being only 0.95cm long, 0.4cm wide and 0.3cm thick. Across the 'waist', its width is 0.3cm, as is its thickness.

The exact provenance of all these pieces is uncertain. However, by analogy with other ivory beads of this shape, it seems probable that the examples from Spy came from the 'deuxième niveau', which is attributed to the Aurignacian. The Type j bead from Goyet is likely to have been of the same age as the examples from Spy, which it resembles so closely. It is possible that the bead found at Goyet was in fact made at Spy, which is approximately 20 km away.

Such double beads have been found in Earlier Upper Palaeolithic contexts throughout Europe, for example from Predmost in Czechoslovakia (Dewez 1981,38) and Brillenhöhle in Germany (see Müller-Karpe 1966,T175,No.20). Another example from the Solutrean middle level at the Fourneau du Diable (Dordogne) is known (Müller-Karpe,1966,T52,D No.9), while this type also appeared in the Upper Palaeolithic of the Ukraine (Boriskovsky 1958,Fig. 139).

Type k: 'B-shaped' beads - This category consists of only one double perforated, B-shaped piece (fig.6:3). It is made of ivory and comes from Trou Magrite. The type is clearly quite close to the 'figure of eight' shape just described, but the 'B' shape is so deliberate that I regard it as worth making the distinction.

Manufacture

(i) Débitage

It is probable that Magrite 72 was deliberately cut out, owing to its regular shape and the presence of a tiny, longitudinal facet round part of one edge.

(ii) Modification

This piece has been so carefully worked that it is polished; fine, longitudinal striations may be seen on both surfaces, as well as three transverse incisions on the flat surface, which look like traces of working with a stone tool. One side has been transversely nicked by scraping, resulting in a facetted effect. The two perforations appear to have been made from both surfaces by drilling and then to have been neatened. One perforation is oval-shaped, while the other is subcircular.

Function

(i) Traces of Use

No traces of use were identified on this piece.

(ii) Use

This piece could have been used as a bead or as some form of 'spacer-plate' linking two strings of beads. It could also have been sewn onto some garment and used as a button. Saccasyn della Santa (1946,44-46) suggested that this was a blank for two beads, with the notch on one side being preparation for the division of the piece into two perforated fragments. This seems unlikely, because it is such a delicate and finely finished piece, with the perforations already made; it would have been hard to separate the two elements without risking breaking both.

Variation and Distribution

This piece is 1.5cm long, 0.75cm wide and 0.15cm thick across the perforations, which are both 0.15cm long and wide. It is the only example of its type and was found at the multiperiod site of Trou Magrite, but as its exact provenance is unrecorded, its age is unknown.

Type 1: Antler beads - Only one example of this type has been found; it is made from a segment of an antler pricket or a small tine and was found

at Goyet (fig.6:3). It resembles an irregular, quite rounded cube in shape.

Manufacture

(i) Débitage

From its shape, Goyet 34 appears to have been extracted from an antler pricket by sawing transversely at both ends, but no traces of this process have survived.

(ii) Modification

What appeared to be longitudinal facetting could be discerned on this piece, but as it was very corroded, no other traces of working were visible, apart from one subcircular perforation. The poor preservation of traces of working means that I cannot be certain how the perforation was made.

Function

(i) Traces of Use

No traces of use were identified on this piece.

(ii) Use

This piece was probably worn as a bead.

Variation and Distribution

Goyet 34 was 1.15cm long, 1.2cm wide and 0.85cm thick. The perforation was 0.3cm long and 0.35cm wide. This was the only bead made of antler to be identified among the collections studied here: it came from an area excavated by Kayser and, predictably but regrettably, no information about its provenance has been recorded.

A study of the published sources suggested that antler was infrequently used as a raw material for making beads compared with ivory. However, antler beads are recorded as having been found in abundance at the Aurignacian site of Abri Blanchard (Dordogne) (Sollas 1915,307; Saccasyn della Santa 1946,49).

A similar shaped piece which is made of ivory is on display in Cheddar Caves Museum: this bead is labelled as being from Gough's Cave. As I was not allowed access to this piece, it was not possible to inspect it closely.

Six spherical pieces of ivory were identified at the Grotte de Spy, which may have been associated with bead manufacture. They are all 1cm or less in diameter and show no traces of working. They may have been made from Type j beads like Goyet 119 and Spy 201 (see fig.6:3). These pieces show no signs of perforation. Twelve similar pieces were identified by Otte (1979,300), but some of them were not strictly spherical.

Miscellaneous:5

Goyet 122

One very interesting piece which was closely associated with bead manufacture was found at Goyet. Goyet 122 is an oblong-shaped fragment of ivory, which had been divided into five segments with paired, transverse nicks (fig.6:3). Each of these segments had a central indentation on one surface and it seems to me very clear that they were intended to be made into beads.

Manufacture

(i) Débitage

This piece was itself probably extracted by the groove and splinter technique, because it has a regular shape and its edges are covered with longitudinal striations and facetting. At one end, there are characteristic traces of sawing and snapping, which may have resulted from the removal of at least one bead. The other end shows only traces of finishing off, in the form of longitudinal striations.

(ii) Modification

Both surfaces of Goyet 122 appear to have been modified by scraping in a mainly longitudinal direction, leaving characteristic traces of this process in the form of grouped, longitudinal and oblique striations and chattermarks. After this preliminary modification, paired, V-shaped incisions have been made opposite each other by cutting and scraping at four points along the long edges, in order to produce five separate segments.

In each of the segments, a perforation has been marked out and begun on one surface, first by scraping and incising transversely, then by drilling. This piece is smooth, where it has been worked.

Function

(i) Traces of Use

No traces of use were observed and none would be expected, as this piece is clearly a piece of working débris associated with the manufacture of beads.

(ii) Use

Goyet 122 was doubtless a 'blank' from which small, perforated pieces of ivory were extracted. It is interesting to observe that in this case, it seems that the final act of bead production was the removal of the bead from the blank and not perforation. As yet, no beads comparable to the shapes which would have been produced from this piece have been identified among the collections from Goyet studied here.

Variation and Distribution

This is the only piece of its kind considered here. It is 3.7cm long, 1cm wide and 0.3 to 0.4cm thick. The 'beads' would have ranged in length from 0.9 to 0.6cm.

Goyet 122 was found in the 'deuxième niveau' at Goyet and is, therefore, most probably of Earlier Upper Palaeolithic age. It provides

the only firm evidence that we have, that beads were actually produced at Goyet, rather than always having been imported from Spy.

Pendants

These are large, deliberately shaped and perforated pieces of bone or ivory, which were probably worn as ornaments (fig.6:4). Eight pieces are considered here which are believed to have been deliberately produced as pendants (see Table 6:3). They include a remarkable range of shapes and of methods of modification: all that they have in common is that they are perforated and that they may have shared the same function. As these pieces are so few in number, it would seem inadvisable to set up a scheme of sub-categories based on morphology.

Coléoptère 14 (fig.6:5) is a double perforated piece of ivory shaped like a beetle and this find is in fact the original 'coléoptère' after which the site was named, whereas Coléoptère 17 (fig.6:4) is a perforated piece of curved limb bone which would not seem particularly interesting, but for its striking similarity to a piece from the Welsh cave of Ffynnon Beuno (fig.6:4). Pin Hole 9 (fig.6:4) is a perforated, curved sliver of ivory, while Paviland 17 (Plate 6:2) is an egg-shaped, perforated piece of ivory made from a natural growth in a wound in a mammoth tusk (Sollas 1913,38-40). Fond-de-Forêt 1 (fig.6:6) is a roughly oval piece of bone possibly intended to resemble a fish, whereas Verlaine 49 (fig.6:5) is much more clearly a representation of a fish, but doubts have been expressed about its authenticity (Lejeune 1984,230). The pendant from the Grotte de la Princesse at Marche-les-Dames (fig.6:4) is a roughly oblong piece of bone with oblique incisions radiating out of its perforation.

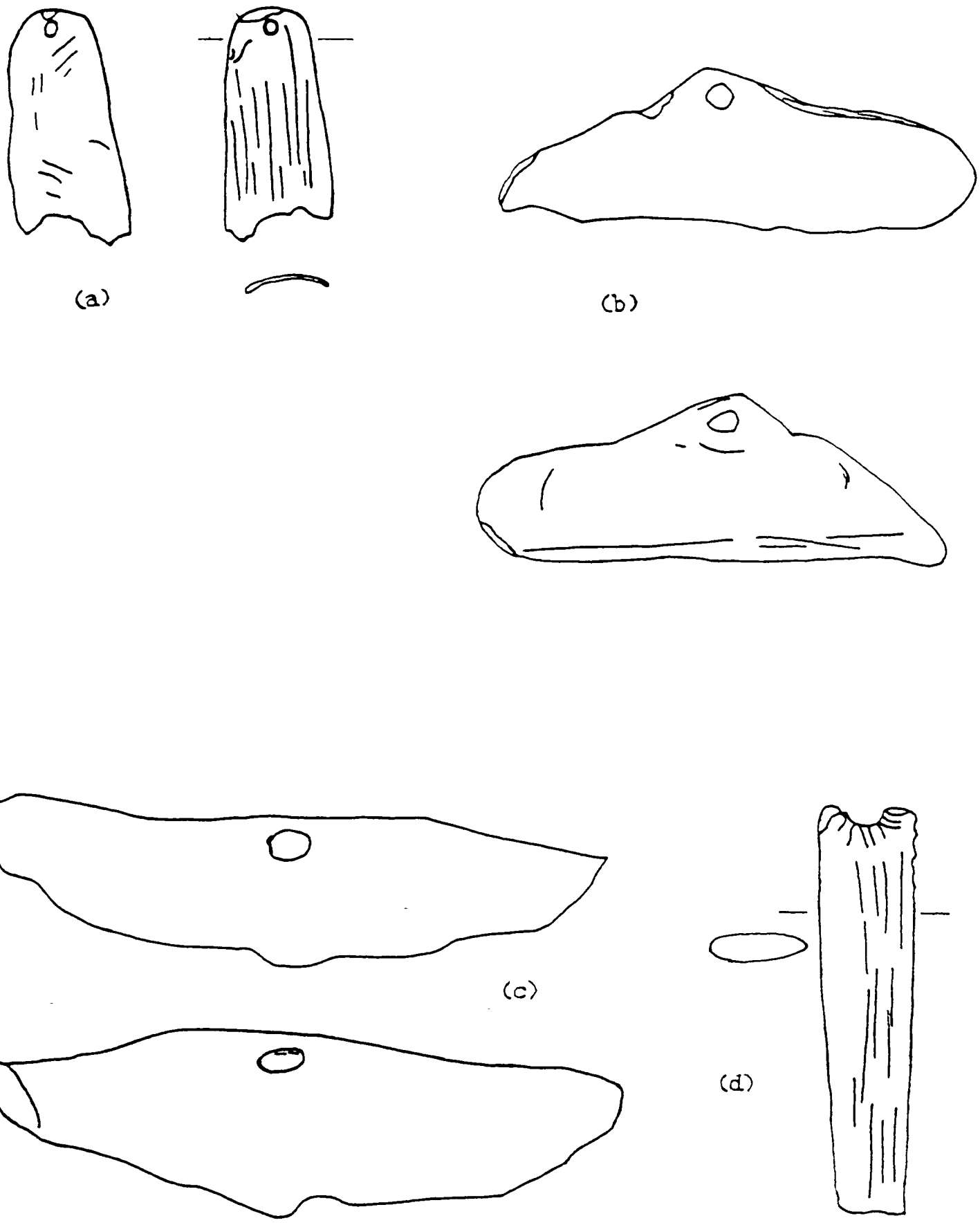


Fig. 6:4 Pendants: (a) Pin Hole Cave 9 (b) Coléoptère 17
(c) Ffynnon Beuno 1 (d) Grotte de la Princesse 3

Table 6:3
Number and Distribution of Pendants

Site Name	Ivory	Bone
Paviland	1	-
Pin Hole	1	-
Ffynnon Beuno	-	1
Coléoptère	1	1
Verlaine	-	1
Fond-de-Forêt	-	1
Grotte de la Princesse	-	1

Manufacture

(i) Débitage

No traces of débitage were identified on Coléoptère 14, while some striations could be seen on the edges of Coléoptère 17 and Ffynnon Beuno 1, but as these pieces are such an irregular shape that it seems probable that these striations were the result of modification rather than débitage. Pin Hole 9 may have been deliberately cut out, for its edges are smooth with some tiny striations visible. No signs of débitage were recognised on Paviland 17; even though it was a modified, naturally egg-shaped growth, it must have been extracted from the tusk, though in what manner is not known. Forêt 1 may have been deliberately produced rather than selected for its existing shape but no traces of débitage were recognised. Both Verlaine 49 and Grotte de la Princesse 3 show signs of deliberate extraction on their sides, in the form of longitudinal facets and striations, which probably result from sawing.

(ii) Modification

All of Coléoptère 14 is polished, while the lower or flat surface is covered with mainly random looking striations, which probably result from the smoothing down of the surface. The upper or curved surface shows traces of modification in the form of fine, longitudinal striations and decoration in the form of a long line incised down the middle of the piece, which is cut by a series of little, oblique incisions, resulting in a barbed wire like effect. Similarly, there are two parallel, transverse

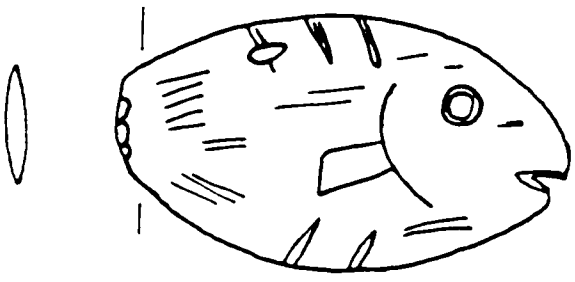


Plate 6:2 Paviland 17

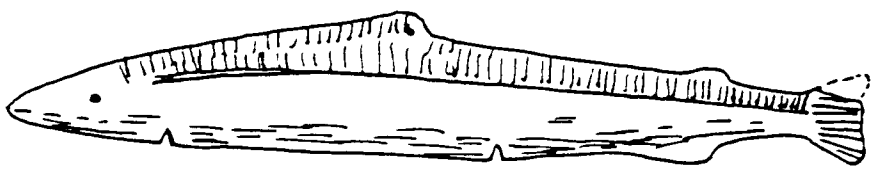
incisions across the tip of the piece, which are cut by a lot of little longitudinal and oblique incisions. The same form of decoration may be seen on two bone splinters from Spy, numbers 15 and 168 (fig.6:15) (see Incised Pieces).

Both Coléoptère 17 and Ffynnon Beuno 1 show a few striations on their surfaces which, from their curved shape, must have been made by scraping. The smooth surface of Pin Hole 9 is covered with irregular striations running in all directions, but the method of modification that they represent is unclear. The lower surface shows only natural corrugations and a few irregular striations near to the perforation. Few striations are visible on Paviland 17, apart from on the worked area around the perforation, which has been made thinner on both surfaces by scraping, probably to aid perforation. On these trimmed areas, very crude longitudinal and oblique striations may be seen, as well as transverse steps where the stone tool has dug into the ivory. A number of very crude, curving or oblique grouped striations resulting from scraping could be seen on the rest of the surface, which was not particularly smooth. It has clearly been quite roughly worked.

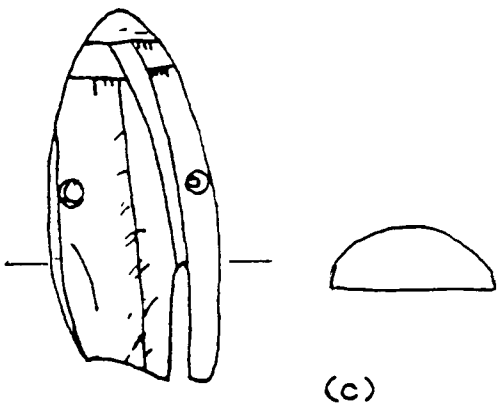
On the cortical surface of Forêt 1, there were traces of modification in the form of a number of striations running in all directions which, when viewed under a light microscope, resembled my own experimentally produced traces of scraping with flint on bone. The area around the perforation has been made thinner on the cortical surface by scraping, producing mainly wide, oblique striations and transverse steps, which clearly showed under the microscope where the stone tool had cut into the bone. There is one deliberate incision on one edge of this piece and five more on the other edge. These could be representations of fins given that Forét 1 looks like a fish, albeit a rather fat and misshapen one.



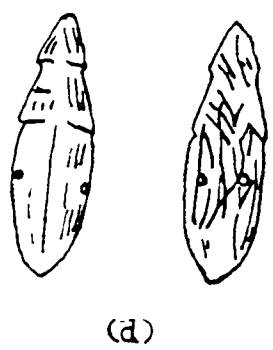
(a)



(b)



(c)



(d)



(e)

Fig. 6:5 Pendants and an Eskimo fish lure:
(a) Verlaine 49 (b) Eskimo fish lure, after Giddings (1967, 30, Fig. 8) length is 10 cm (c) Coléoptère 14 (d) 'beetle' found at the Grotte du Trilobite, after de Mortillet (1903, Pl. XXVII, 238) (e) 'ladybird' found at Laugaie-Basse, after de Mortillet (ibid, 239)

By contrast, there can be no doubt that Verlaine 49 was intended to look like a fish. It is a charming piece, whose surfaces have clearly been modified by scraping, as they show characteristic traces such as chattermarks, as well as longitudinal and oblique striations. On each surface, there are also deep incisions to mark the mouth, the fins and the gills. Grave doubts have been expressed about its authenticity; Lejeune who has studied this piece closely, has indicated that the incisions look very fresh and suggested that they could have been added to a piece of bone that was itself cut out during the Palaeolithic,

> "sur un support en contour découpé paléolithique, il pourrait éventuellement y avoir eu des traits gravés plus récents" (1984,230).

Likewise, Breuil (1930,57) suggested that Verlaine 49 and the bone pin found at the site (Verlaine 50) were modern, but made on fossil bone (see Chapter 5:Pins). The traces which I observed in the 'eye' of the 'fish' (see below) would seem to support this conclusion.

Both surfaces of Grotte de la Princesse 3 are covered with longitudinal striations and facets from scraping; towards the perforated end, the stone tool has cut into one edge, producing three incisions. This piece was generally smooth, probably as a result of working.

Seven pieces had been perforated by drilling, with subsequent neatening in the case of Ffynnon Beuno 1 and possibly also Pin Hole 9. Tool marks are often visible within the perforations. The eighth pendant, Grotte de la Princesse 3, appeared to have been perforated first by scraping from the lower surface and then by drilling, mainly from the lower surface. On the upper surface, six incisions may be seen radiating out of the perforation; similar features have been observed on certain other Palaeolithic perforated pieces (see below).

The two perforations on Coléoptère 14 provide the eyes of the beetle; they were made by drilling from both surfaces and are crooked in profile, owing to the plano-convex profile of this piece and as the perforations are set next to one edge (see fig.6:5).

Verlaine 49 is triple perforated: there are remains of a biconical perforation at the 'tail', where the piece is broken. It may have been designed to be suspended at this point, instead of from the eye, which was worked from both surfaces by drilling leaving very angular, prominent facets. Such sharp traces are unlikely to have been produced with a stone tool and may indeed point to its production using a metal knife. There is also a channel-like perforation through the fins on one edge, which may have been made by enlarging a natural vascular canal in the bone. Unfortunately, any traces on this feature are masked by deposit.

All of the perforations seem to have been circular or subcircular, with the exception of the oval hole through the fins of Verlaine 49, while the perforation on Ffynnon Beuno 1 appeared to be oval on the outer surface.

Function

(i) Traces of Use

Possible traces of use were identified on the perforations of Ffynnon Beuno 1 and Coléoptère 17: this took the form of a shallow 'lip' on each side, on opposite surfaces, so that they made a straight, oblique line across the perforation (fig.6:4).

(ii) Use

Coléoptère 14 is a very attractive piece, which may have been designed for use as a pendant, or as a charm or an amulet. If the fish-shaped pendant from Verlaine should turn out to be authentic, then it could have been used either as a pendant or as a fish lure of the kind used by the Eskimo, which is illustrated by Giddings (1967,30,Fig.8) and

reproduced here (fig.6:5). This form of use has been suggested (de Saint-Périer 1928) for perforated representations of fish found in the French Upper Palaeolithic for example at Le Placard, which are considerably more schematic than Verlaine 49. Fond-de-Forêt 1 might also have had this function, though it seems a little large.

The wear on Coléoptère 17 and Ffynnon Beuno 1 is unlikely to have resulted from rubbing against the thongs by which they were suspended, because it occurs in two locations. The wear on these pieces resembles that observed on shaft-straighteners (see Chapter 5:Perforated Bâtons), although they are clearly too small to have been used on antler rods, it is possible that they were used to smooth or straighten taut thongs or reeds. Unfortunately, there is no available contextual information about these artifacts, which could suggest how this wear came about. Whatever their function, the likeness of these two pieces is interesting; however, they are just perforated limb bone fragments rather than any elaborately designed and produced type, so the resemblance may be built in and coincidental, rather than important.

The other three pieces, Paviland 17, Pin Hole 9 and Grotte de la Princesse 3 were most probably worn as pendants for ornament, and indeed all eight pieces may have been so used.

Variation and Distribution

There is considerable variation in the size of these pieces, but this is to be expected because the only feature that they share is that they are perforated, possibly decorative objects, and so I see no need to record their dimensions in detail here. The eight items also clearly vary as regards their shape and the location of the sites where they were found; they also vary in age. Both pieces from Coléoptère come from the Magdalenian occupation of the site, while Verlaine 49 is either Magdalenian, modern, or else a piece of Pleistocene bone which was

modified during the last hundred years. Grotte de la Princesse 3 comes from an Aurignacian occupation (Otte 1974), while Paviland 17, Forêt 1 and Pin Hole 9 come from sites with a mixture of Upper Palaeolithic industries. Forêt 1 is attributed to the Perigordian by Otte (1979,518), but the excavator of this piece, Hamal-Nandrin (1908,110) believed that it formed part of a Magdalenian assemblage, which also included about fifty blades. As regards Paviland 17, arrangements have been made to attempt to obtain a radiocarbon accelerator date from the piece of mammoth tusk from which this piece was extracted (Sollas 1913,38-39), which should give some indication of its age. The perforated bone from Ffynnon Beuno may be Earlier Upper Palaeolithic in the British sense as the ten stone tools found at the site have been attributed to that period (Campbell 1977,105).

As pendants of various kinds, including perforated teeth and shells, are a regular feature of the Upper Palaeolithic, the wide geographical and chronological distribution of the pieces studied here is hardly surprising. Two other pieces may form part of this group, they are Goyet 65 and Hoyle 1 which have been classified as perforated Group 4 points, whereas they may have been pointed pendants. There is an interesting parallel for Grotte de la Princesse 3 figured by Hahn (1972,255,Fig.7, No.18), which is a perforated piece of ivory from Vogelherd IV in Germany, also of Aurignacian date. It is very similar in outline and its sides are regularly notched, which may be another point of similarity, bearing in mind the three incisions on one edge of Grotte de la Princesse 3. Furthermore, the Vogelherd artifact has curving striations running both around and through the perforation. Hahn suggests that,

> "incised perforations are perhaps a horizon style of the Aurignacian because they occur also on perforated antler objects of the French Aurignacian" (1972,257).

Parallels for Coléoptère 14 have frequently been drawn with the representation of a beetle in lignite found in a Magdalenian level at the Grotte du Trilobite at Arcy sur Cure (Yonne) (Hamal-Nandrin et Servais 1925,13; Ausselet-Lambrechts 1930,13; de Mortillet 1903, Pl XXVII,238), and reproduced here (fig. 6:5). Further comparisons have been made with the ivory ladybirds discovered at Laugerie-Basse (Dordogne) and Cap-Blanc (Dordogne) (Hamal-Nandrin 1925,13; Ausselet-Lambrechts 1930,13-14; de Mortillet 1903, Pl XXVII,239); the former is also reproduced here (fig.6:5).

A further fourteen perforated fragments of bone and antler from Pin Hole, Chaleux, Goyet and Spy (see Appendices 1 and 3) were identified among the collections studied here. However, they were not sufficiently distinctive as regards their shape or their methods of modification to be included in this category.

Miscellaneous: 6

Coléoptère 15

This is a carefully worked, double perforated piece of cortical bone (fig.6:6), which was found in the Magdalenian layer at Coléoptère (Hamal-Nandrin et Servais 1925,6,13). It could have been worn as a bead or a pendant, or even used as a button; its small size makes all these possible.

Manufacture

(i) Débitage

The blank for this piece is highly likely to have been deliberately extracted, rather than casually selected, but any traces of this process have been either concealed or obliterated by later modification.

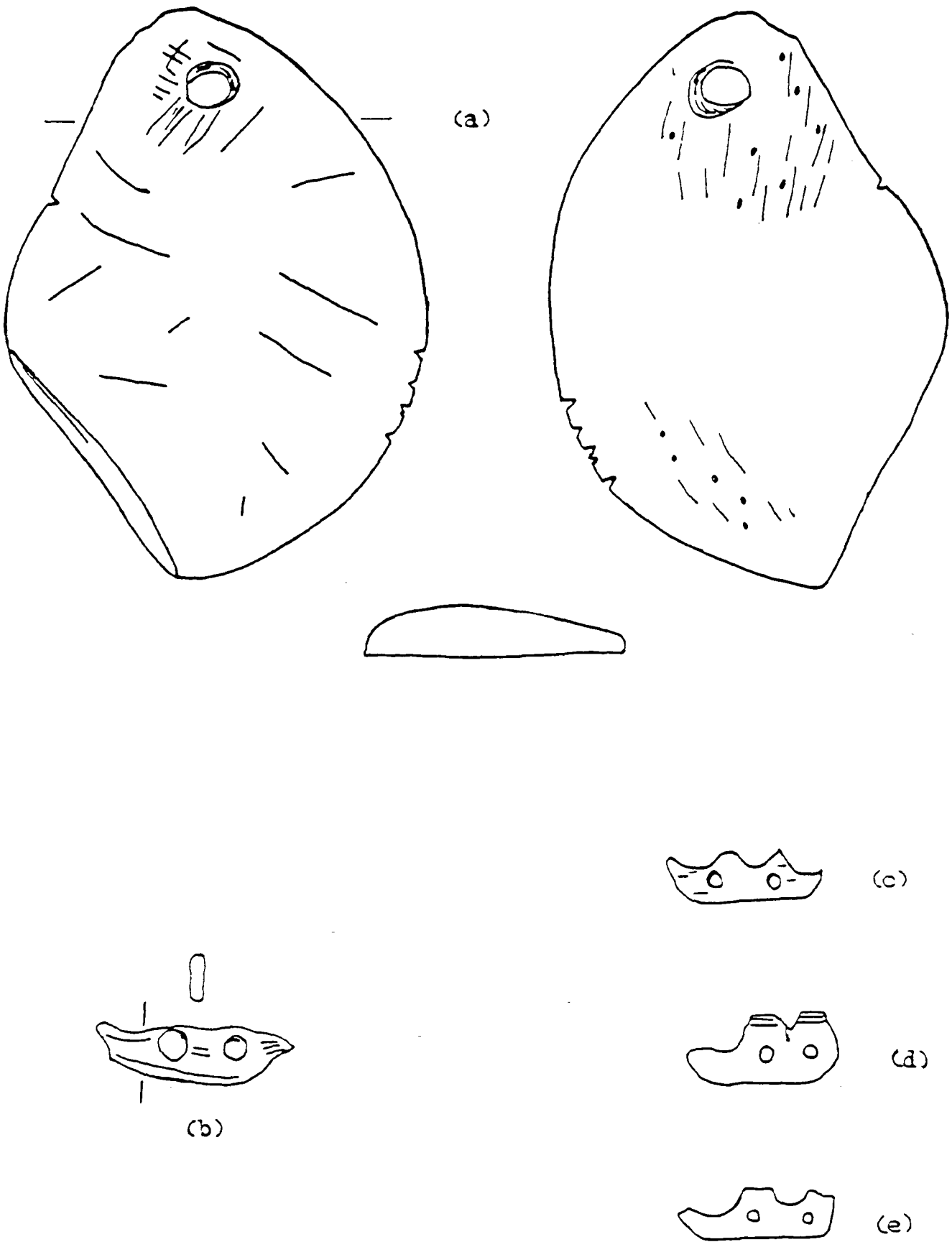


Fig. 6:6 Pendants and perforated artifacts:
(a) Fond-de-Forêt 1 (b) Coléoptère 15 (c) Perforated artifact, after Coularou et al. (1978, 602, Fig. 4:21) (d) (op. cit., 603, Fig. 5:12) (e) (op. cit., 604, Fig. 6:13)

(ii) Modification

Coléoptère 15 has been both very carefully and extensively modified, so much so that its surfaces are polished. A silicone rubber cast was made of part of one surface of this piece, so that it could be inspected microscopically. This revealed that the method of modification used must have been scraping, for both surfaces and sides are covered with longitudinal and oblique striations and tiny chattermarks. This piece has two neat, circular perforations, which were made by drilling possibly from both surfaces and then subsequently neatened, for they have cylindrical rather than biconical profiles. Traces of this process may be seen in the form of helical striations within the perforations.

Function

(i) Traces of Use

No traces of use were identified on this piece.

(ii) Use

The shape of this attractive piece suggests that it may have been used as a button or a bead, or pendant.

Variation and Distribution

No parallels for this piece exist in either the British or the Belgian Upper Palaeolithic. Mariën (1981,246-247) suggests that this piece is either intrusive from a Neolithic layer, or that it was deliberately placed in the layer in which it was found as a hoax. This is because it is of a type thought to be unknown in the whole of the Upper Palaeolithic, but very similar pieces appear frequently in the later Neolithic of Eastern Languedoc and are called 'pendeloques en crochet' (Coularou, Stordeur and Aigoin 1978). The French examples are certainly very like Coléoptère 15, although many are triple-perforated and their shapes are generally more pronounced (fig.6:6). In spite of their similarity, it would seem very curious to me if an artifact with such a strictly

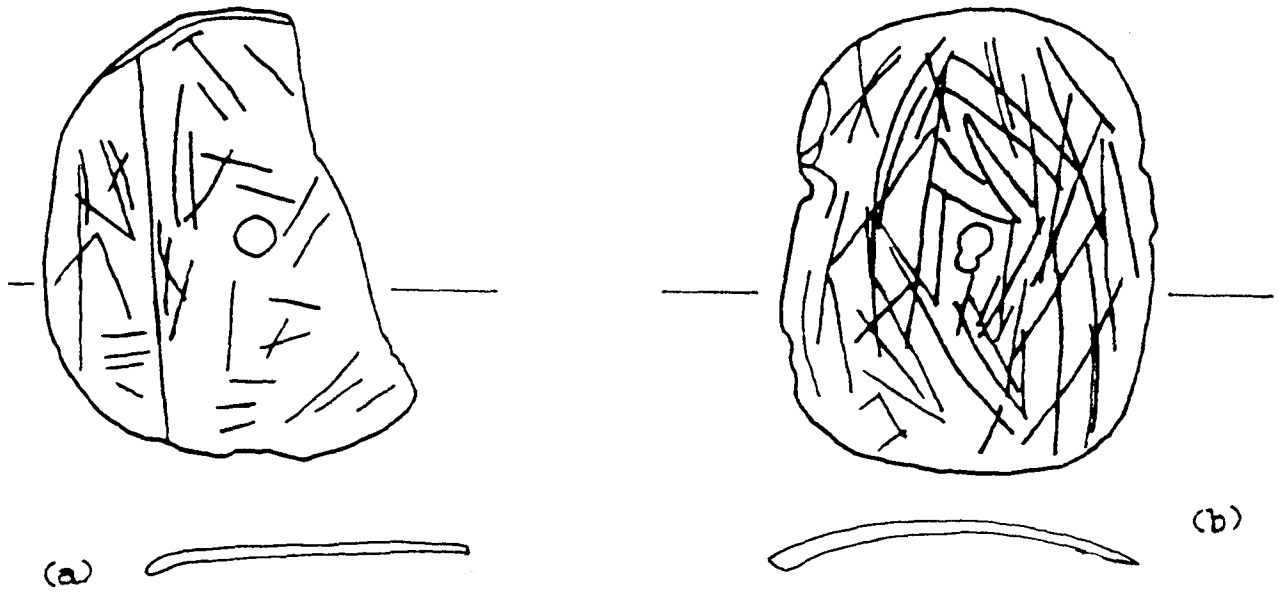
Southern French Neolithic distribution (Coularou et al. 1978,598,Fig.1) appeared either as a hoax or a Neolithic intrusion in the Belgian Upper Palaeolithic. A possible indication of closer parallels may be the two pieces from the Magdalenian site of Petersfels in Germany figured by Müller-Karpe (1966,T193,Nos.32 and 33). These two artifacts are much more like Coléoptère 15 in outline than the French pieces, although they are not perforated, they are illustrated with some other curiously-shaped, little perforated objects, so they may just be unfinished. Unfortunately, I have had no opportunity to inspect them for myself.

Perforated ivory discs

These are subcircular, very thin pieces of worked ivory, which have a roughly central perforation (fig.6:7). Two examples of this type have been found on the Magdalenian site of Trou de Chaleux in Belgium (see Dupont 1872,157).

They appear to have been deliberately cut out and then worked by scraping, leaving their surfaces covered with striations. Each piece appears to have been perforated by drilling and then neatened to give the perforation a cylindrical profile. Both discs are chipped or broken, which, owing to their fragility, could have either have resulted from use or could have occurred post-depositionally. Possible areas of wear were identified on the perforations, which may have resulted through use by rubbing against a thong either on which they were suspended, or by which they were tied to some material. Therefore, the function of these discs is thought either to have been ornamental, as beads or pendants, or functional, as buttons.

It is suggested below that these two Belgian artifacts are related to the 'perforated bone discs' analysed by A. Sieveking (1971). This category



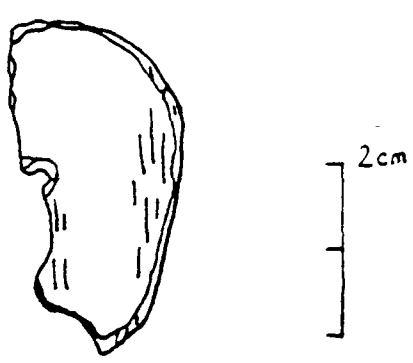


Fig. 6:7 Perforated ivory discs: (a) Chaleux 111
(b) Chaluex 110
(c) from Spy, after Otte (1979, 301, No. 1)

is regarded as a type-fossil of Magdalenian IV (de Sonneville-Bordes 1960,354) and has a widespread distribution across Europe.

Manufacture

(i) Débitage

These pieces appear to have been deliberately cut out from a flat piece of ivory, as longitudinal striations may be seen on those parts of the edges, which are neither too corroded, nor too liberally coated with deposit for traces of working to be preserved. The exact manner in which such thin slivers of ivory were extracted is unclear, but it seems probable that a suitable-sized piece of ivory was removed longitudinally from the tusk, prior to the cutting out of these discs. They are certainly not sawn sections of the tip end of the tusk.

(ii) Modification

Both surfaces of each disc are covered with quite crude, longitudinal, transverse and oblique striations: these are not decorative, but probably result from scraping, as they resemble the individual strokes of a stone tool. Neither disc now appears to be polished, although according to their excavator,

> "des plaques d'ivoire ont été arrondies, polies et trouées au centre" (Dupont 1872,157).

These pieces are gently curved in profile, which could either have been an original or a post-depositional feature.

Chaleux 111 has a roughly circular perforation, which is centrally placed and appears to have been made by drilling from both surfaces, though it has been subsequently neatened, as it has a cylindrical rather than a biconical or 'hour-glass' profile. This perforation is 0.4cm long and 0.4/0.45cm wide. Chaleux 110 is perforated with two conjoining holes, which may have been an accident caused by starting the perforation

inaccurately on one surface, or may represent a failed attempt to produce two holes in close proximity. These perforations appear to have been made by rotation from both surfaces and then to have been neatened, as they are cylindrical rather than biconical in profile. Each perforation is circular and is located approximately in the centre of the piece. Their respective dimensions are 0.35 and 0.15 cm long and 0.35 and 0.15cm in width.

Function

(i) Traces of Use

One piece is chipped, while a fragment has been obliquely broken off the other disc. This damage could have equally occurred during use or post-depositionally, owing to the fragile nature of these artifacts. At one point on the perforation of Chaleux 111, there are two possible areas of wear, one on each surface, which could either have resulted from rubbing against a thong during suspension, or else might have arisen during the making of the perforation. On Chaleux 110, there are possible traces of use on the smaller perforation in the form of bevelling of one edge and there is also a similar feature on one part of the edge of the larger perforation. Again it is not clear whether this was a feature of manufacture or use.

(ii) Use

These discs could have been perforated for suspension as large beads or single pendants. They are described as "des ornements" by Dupont (1872,157), but however attractive they may be, they could also have been functional: for example, they could have been sewn onto garments as buttons (see below).

In her discussion of the possible function of Upper Palaeolithic bone discs (see below), A. Sieveking (1971,211) suggests that they would have been too fragile to have been used for buttoning clothing made of skin or

fur. This may have been the case, though it also seems to me that just such a use would explain the damage to the Belgian examples described here. The reported restriction of these pieces to Magdalenian IV in South West France, and their occurrence within the comparable Magdalenian here could to my mind be explained by this type being a particular and perhaps temporary fashion in clothing. However, the decoration found on many examples suggested to Sieveking that they may have been pendants, suspended so that both surfaces could be seen, as opposed to just the one. Sieveking (op cit.228,Note 8) also refers to de Saint-Périer's suggestion that groups of bone discs were strung and shaken to make a rattling noise, as a form of primitive musical instrument, though this seems rather unlikely.

Variation and Distribution

It is probable that when the two ivory discs considered here were complete, they were closely similar in size with a length of 4.5/4.65cm, width of 3.05/3.5cm, and a thickness of 0.4/0.45cm, while the thickness of the edge was approximately 0.15cm.

Only these two examples of this type have been recognised by me in the region of this study. They both come from the same site, that is the Trou de Chaleux and because they are so similar in size and appearance, it seems likely that they come from the same occupation and were perhaps even made by the same person. An incomplete third example has been identified amongst the collections from Spy (Otte 1979,310,301,Fig. 124,No.1; Dewez 1981a,68). Although no contextual information appears to be available for this piece, it has been attributed to the Magdalenian by those authors, owing to its similarity to the two perforated ivory discs from Chaleux.

De Sonneville-Bordes (1960,354) recognised as a type fossil of Magdalenian IV "des rondelles d'os découpées avec un trou central", which to judge from her illustrated examples were very similar to the ivory

discs described here. Sieveking (1971) who has carried out a very detailed study of such artifacts, which are found throughout Europe from South West France to Russia, has described them as,

> "a group of very distinctive objects, small discs usually made from a circle of bone cut out of the scapula of horse or deer, or very occasionally made of stone. These discs are flat, often very thin and delicate, the majority of them have a hole in the centre, and they vary in size from about 3 to 8cm in diameter. A few are plain but most of them are decorated with either a schematic design or with drawings of animals" (1971,207).

Sieveking (1971,228,Note 12) stated that Chaleux 110, which is illustrated by Dupont (1872,157,Fig.31), "is not a disc". The reason for this opinion is unclear to me, because the Belgian pieces do seem to fit the general description given above. It is possible that any differences in appearance that seemed significant to her may result from their having been made out of ivory, as opposed to bone or stone. However, a small number of discs are recorded by Sieveking as having been made of ivory: they include examples from Isturitz in the Pyrenees, Petersfels in Germany and also from Brno, Czechoslovakia (p213-214,221). It is true that the Belgian examples are not strictly circular, but nor are some quoted by Sieveking, for example a bone disc from Laugerie Basse (see Plate 79,No.21) and two ivory examples from Mal'ta in Siberia (Plate 83,Nos.40 and 41). The Belgian examples also lack any recognisable schematic or naturalistic decoration of the type identified by Sieveking (p207-208), but they still seem to me to resemble sufficiently the discs described by Sieveking to be included in this group, and their Magdalenian context is certainly generally similar.

Ivory Rings

These are large rings made of ivory, one of which has received some incised decoration (fig.6:8). Three examples of this type have been examined by me; two come from Belgium and were found at Trou Magrite and at the Grotte de la Princesse at Marche-les-Dames. The third ring was discovered by Buckland at Paviland Cave with the skeleton of the 'Red Lady' (Buckland 1823,88-89), and is likely (though not proved) to have been associated with what was evidently an Upper Palaeolithic burial.

These rings have been deliberately cut out and in the case of Magrite 71, certainly modified by scraping. Grotte de la Princesse 5 has also received a substantial amount of incised decoration. No traces of use were identified on these pieces, which are all broken; Paviland 43 is particularly fragmentary. Various possible, related functions for these pieces are discussed; they include use as rings, bangles, charms or amulets.

Similar artifacts were also found at the Grotte de Spy in the 'deuxième niveau' (Otte 1979), but owing to constraints on time and money it was not possible to examine them. Ivory rings have also been recognised on a number of French sites, including Le Placard (Sollas 1915, 309,Fig.147,2; Saccasyn della Santa 1946,40); further examples were found at the site of Pavlov in Czechoslovakia (Müller-Karpe 1966,T217). The distribution of ivory rings is limited within the region of this study and appears to be generally restricted to those Earlier Upper Palaeolithic or, in particular, those Aurignacian sites where ivory-working was regularly practised.

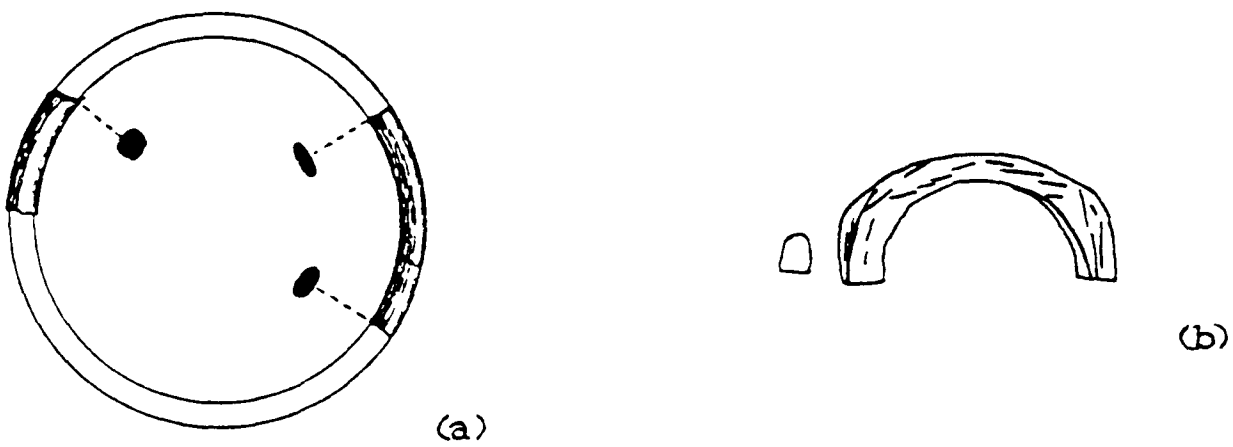


Fig. 6:8 Ivory rings: (a) Paviland 43, after Sollas (1915, 309, Fig. 147.1)
(b) Trou Magrite 71
(c) Grotte de la Princesse 5

Manufacture

(i) Débitage

The shapes of these pieces suggest that they were deliberately cut out. Sollas (1913,37) reconstructed the technique by which he believed the Paviland ivory ring was extracted: his suggestion was that such a ring of ivory could be produced by transversely sawing off a slice from the naturally hollow base of a mammoth tusk. An unfinished ring from Le Placard (Charente) which was apparently produced in this way is illustrated by Sollas (1915,309,Fig.147,3). This would mean that the marks of extraction would be on the 'surfaces' rather than on the 'sides' of the ring and that the ring would be cutting across the natural longitudinal 'grain' of the ivory, which appears not to be the case for Grotte de la Princesse 5 and Trou Magrite 71 (Otte 1974,223; Saccasyn della Santa 1946,40). In fact the two Belgian rings show clear traces on their sides which are interpreted as resulting from débitage, which suggest that they were cut longitudinally out of a piece of ivory, rather than across the tusk. Unfortunately, the ring from Paviland is not sufficiently well preserved for any such traces to have survived, so that Sollas's hypothesis cannot be tested.

In the case of Magrite 71, both sides of the ring were covered with longitudinal and oblique striations and with longitudinal and transverse facets. Such an abundance of traces is probably the result of both débitage and later modification. Probable signs of débitage were exhibited on the ring from the Grotte de la Princesse; on the outer side some longitudinal striations could be seen, while there were similar traces on the inner side, as well as a longitudinal facet near to one end and a series of little, transverse facets all the way round.

(ii) Modification

On the surfaces of Magrite 71, there were various quite crude striations, which appear to be associated with scraping, as they look like the individual strokes of a stone tool. There was also some longitudinal facetting on one surface. Although Magrite 71 was not as carefully worked as the other two pieces, it was smoothly finished which was probably a result of modification. Magrite 71 is also quite angular, unlike the other two rings which seem in each case to have formed part of a smoother circle. A few longitudinal striations may be seen on both surfaces of the ring from the Grotte de la Princesse, which are also cut by various incisions. On one surface, there is a deliberately incised St. Andrew's cross, whereas on the other surface, there is a series of thirty-two transverse and oblique incisions along the outer edge: most of these incisions are very short, but a few extend right across the surface. The significance of these incisions remains unknown, though they may have been purely decorative. Similar, but more regularly spaced, transverse incisions may be seen on a ring from Le Placard (Sollas 1915, 309, Fig. 147,2). Lots of probably post-depositional scratches could be seen on the surfaces of Paviland 43, but unfortunately no organised traces of modification have survived.

Function

(i) Traces of Use

No traces of use were identified on any of these pieces, although it is possible that they were all broken during use. The Paviland ring now consists of at least six fragments, but all the ivory from this site is in a particularly poor condition, probably owing to the saltiness of the sea air which would accelerate desiccation.

(ii) Use

Both the Belgian pieces are clearly too small to be parts of an adult's armlet, but are also a little too large to be finger rings. They could have been bangles for a small child or pendants or amulets (see MacGregor 1985,105-110), which were worn on a thong.

The various ring fragments found by Buckland were reconstructed as one armlet by Sollas (1913,36), who indicated that, "their curvature on the inside corresponds with a circle 62 mm. in diameter". If this piece was originally this size, then it would still be small, but it could be worn by an adult. However, Jacobi has disagreed with this reconstruction, claiming that,

> "differences in cross-section suggest that the burial was accompanied by two bracelets, not just one as reconstructed in Sollas" (1980,31).

This variation, in my opinion, does not preclude these fragments from being parts of the same object, for my examination of the Belgian rings showed variation in dimensions and cross-section within each piece.

Variation and Distribution

What little survives of these rings suggests that there was considerable variation in their shapes and sizes (fig.6:8). They are clearly very restricted in number, though they were found at widely dispersed sites geographically speaking; their chronological range is more difficult to assess. The ring from the Grotte de la Princesse has been attributed to the Earlier Upper Palaeolithic in general and to the Aurignacian in particular, as the main occupation of this site dates to this period, although Otte (1974a,212) has also recognised traces of the Gravettian. A series of Upper Palaeolithic industries has been identified at Trou Magrite, but Magrite 71 has been classified by Otte as Aurignacian (1979,168), on the grounds of its similarity to a ring from

Spy (see below), which was believed to have been part of the Aurignacian ivory-working industry at that site. Paviland 43 also comes from a complex, multiperiod site, but according to Buckland (1823,88-89) the ivory ring fragments were found with the ivory rods among the ribs of the 'Red Lady' skeleton, and so may be taken to be associated with the burial. The skeleton has been radiocarbon dated to 18 460 ± 340 years BP (BM-374) (Campbell 1977:II:19), which was rather surprising in view of the fact that this was the time of the Last Glacial Maximum. It is hoped that another attempt will be made to date the skeleton, this time by the radiocarbon accelerator method, in order to check the earlier findings and to provide a date for the ivory rods and ring fragments, on the assumption that the association was a true one.

Five ivory rings were recovered from the 'deuxième niveau' at the Grotte de Spy (Otte 1979,302); it is this level which was heavily tinted with red ochre and contained a massive ivory-working industry, associated with an assemblage of Aurignacian stone artifacts. The three smaller rings are complete and range in diameter from 2.4 to 1.5cm. It is the two larger pieces which are comparable with those described here; they are incomplete fragments of flat rings. The piece illustrated by Otte (1979,301,Fig.124,No.4) is especially reminiscent of Magrite 71 in size and also because it is so angular.

Similar ivory rings from the Eastern Gravettian at Pavlov in Czechoslovakia and another from the lowest Solutrean layer at the Fourneau du Diable (Dordogne) are illustrated by Müller-Karpe (1966, T217,B,No.28;267,T52C,No.3), while other examples were found in a Solutrean context on the French site of Le Placard (Charente) (Saccasyn della Santa 1946,40).

The chronological evidence outlined above does seem to point towards the Belgian and British rings as being components of Aurignacian ivory-

working industries, although this does not appear to have been the case for ivory rings as a whole during the European Upper Palaeolithic.

Perforated Teeth

These are teeth which have been perforated through the root, either for suspension, or for trimming garments. Some examples bear decorative incisions (fig.6:9). Perforated teeth are a regular feature of the European Upper Palaeolithic: to give only a few published examples, they were found at Arcy sur Cure (Leroi-Gourhan et al. 1976,1325), at Isturitz and Mas d'Azil (Saccasyn della Santa 1946,37), at Petersfels and Brillenhöhle (Müller-Karpe 1966,295,303,T175) and at Istállóskö (Hahn 1972,255). The much smaller number of decorated examples include that illustrated in de Mortillet (1903,PlXXIII,No.186) from Laugerie Basse.

The number and distribution of the perforated teeth described here are given in Table 6:4 below.

Table 6:4
Number and Distribution of Perforated Teeth

Goyet	5
Coléoptère	1
Spy	4
Kendrick's Cave	10
Paviland	5
Kent's Cavern	1
Total	26

These pieces were examined for traces of production, but no débitage was required to produce these simple pendants and only the minimum of traces of working could be seen on the majority of the teeth. However, this was not the case for the teeth found at Kendrick's Cave, which were heavily modified by longitudinal scraping and then decorated with grouped, transverse incisions. Parallels for these unusual pieces were found at

Goyet. A large variety of methods of perforation were identified on the teeth; they included drilling, scraping, a combination of the two and percussion. It is probable that they were worn as ornaments, as is well documented ethnographically (Stewart 1973,144). The suggestion made by G. Sieveking (1971,247) that at least some of these teeth may have been deposited as grave goods is also considered. It was found that the teeth studied here had a wide chronological and geographical distribution, which was hardly surprising as perforated teeth are found regularly throughout the Upper Palaeolithic.

Raw Material

The most frequent types of teeth to be perforated are fox and deer canines, which was also observed by Otte (1979,595) when studying a larger sample of Belgian teeth, whereas Hahn (1972,260) found the frequency of perforated fox canines to be so high in his study of the Aurignacian of Eastern and Central Europe, that he assigned them to a different category from the rest of the perforated teeth. These particular teeth may have been selected because their shape was thought to be attractive. A further reason for choosing fox canines may be because the root of this tooth is often hollow and thus, easily pierced.

Manufacture

(i) Débitage

No blank extraction was practised.

(ii) Modification

Some teeth show a few striations on their surfaces, but no organised traces of modification apart from perforation: these are Goyet 121, Coléoptère 28, Paviland 45 and 49. A reasonable covering of striations could be seen on Spy 125, 263 and 264, and on Paviland 48; these traces appeared to be associated with scraping, as they looked like the individual strokes of a stone tool. In the case of Paviland 48, pinky-red

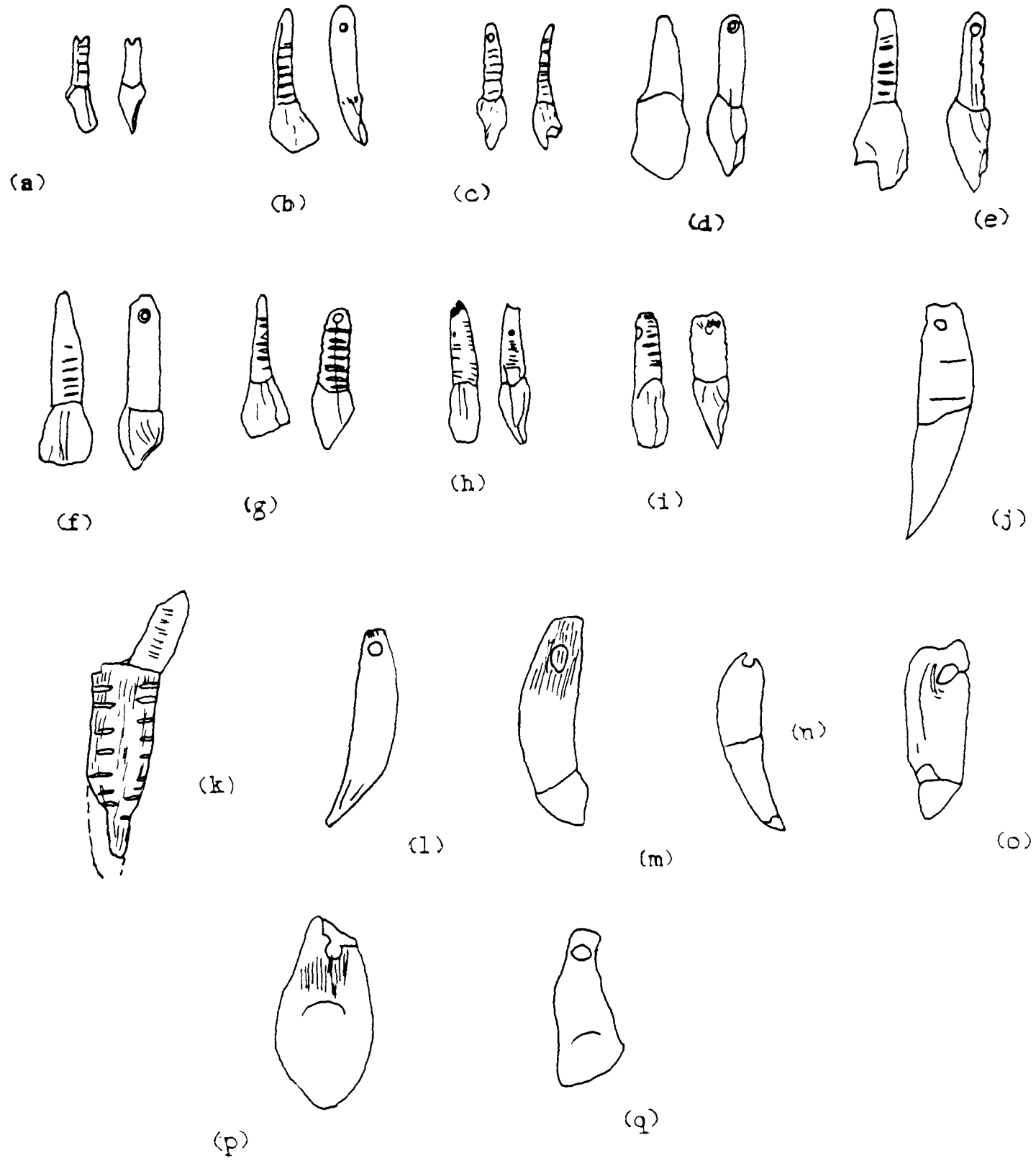


Fig. 6:9 Perforated Teeth: (a) Kendrick's Cave 1 (b) Kendrick's Cave 2 (c) Kendrick's Cave 3 (d) Kendrick's Cave 4 (e) Kendrick's Cave 5 (f) Kendrick's Cave 6 (g) Kendrick's Cave 7 (h) Kendrick's Cave 8 (i) Kendrick's Cave 9 (a) to (i) after Sieveking (1971,237,Fig.4) Scale is 1:2 (j) Kendrick's Cave 10 (k)× after Davies (1925,104,Fig.1,No.7) (l) Coléoptère 28 (m) Spy 264 (n) Goyet 121 (o) Kent's Cavern 10 (p) Paviland 48 (q) Paviland 49

× Aveline's Hole

ochreous colouring could be seen within the striations on one surface. Both Goyet 97 and Kent 10 appear to have been smoothed down around the perforation, but no traces caused by this process have survived. A number of teeth do actually show traces of scraping around the perforation, which are interpreted as the result of an attempt to reduce the area to be pierced; these teeth are Goyet 96 and 98, Spy 263 and 264, and Paviland 48. On Goyet 98, these traces take the form of longitudinal striations and little, transverse 'steps', where the stone tool has dug into the tooth. Possibly along the same lines, a series of tiny, oblique striations may be seen on one surface of Goyet 1, which may have been a result of preparation for the perforation. No traces of modification were preserved on Paviland 46 and 47, and it was not possible to examine Spy 14 in detail, owing to lack of time.

The teeth from Kendrick's Cave were particularly heavily worked by longitudinal scraping, so that the root, and occasionally the crown, are covered with crude, longitudinal striations. Two examples, Kendrick's 5 and 8, showed clear reduction of the area to be perforated.

Apart from the modification described above, some transverse incisions could be seen on Goyet 98, while one transverse incision could be seen on one surface below the perforation on Goyet 97. On Paviland 48, there is one longitudinal groove just below the perforation, which seems to cut the smooth, rounded edges of the perforation. However, such traces are very different from the highly organised, grouped transverse incisions on the perforated teeth from Kendrick's Cave. These decorative incisions are generally filled with red ochre, which may have been deliberately applied. It is not always clear how many incisions there are in any group, as there is often much recutting and many scratches. Their distribution will be outlined in Table 6:5 below.

Table 6:5

Number and Distribution of Incisions on Kendrick's Cave Teeth

Number	Surface	Surface	Side	Side
KDK1	-	-	6	7
KDK2	-	-	7	-
KDK3	-	6	11	8
KDK4	-	-	-	-
KDK5	-	!	*	!
KDK6	-	-	8	7
KDK7	7	7	8	8
KDK8	12	*	11	11
KDK9	-	-	9	8
KDK10	-	2	-	-

* covered with transverse incisions

! the area near to the perforation is covered with transverse incisions

A variety of methods of perforation were illustrated by these pieces. A majority of sixteen perforations had been made by drilling from both surfaces. Of these, Spy 263 was unfinished, while Kendrick's 8 had been broken across a perforation and so, a second perforation had been made 0.5cm further down the root, by drilling from both surfaces. Three pieces had been perforated from both surfaces by scraping; one of these, Spy 264, was unfinished. A combination of these methods was carried out on Goyet 98, which had been partially perforated from both surfaces by scraping and then had been neatened by rotation. If the perforation on Kendrick's 10 is artificial and deliberate, then it must have been made by percussion. Three teeth from Paviland, numbers 45, 46 and 47 are described by Sollas (1913,37) as being perforated, but since they have subsequently been broken below the perforation, the method used is unknown. Likewise, Spy 125 has been broken across its perforation and no traces of working have survived. Where it could be distinguished, the perforation was either oval (7 examples), circular (13 examples) or very irregular-shaped (KDK 10).

Two phases of working were identified on Kendrick's 8, in that not only had it been perforated twice (see above), but also two sets of transverse incisions had been made, each of which was apparently associated with one perforation. The first group of six transverse

incisions were located close to the tip of the root, near to the first (broken) perforation, and these had been scraped over, so that they appeared to be shallow and indistinct compared with the second group. The second series, comprising five incisions, was further down the root; these incisions were deeper, more clear-cut and had had ochre rubbed into them. To my mind, the most probable interpretation of these traces is that the first group of incisions was cut just below the tip of the root, then the perforation was made as the final act in the sequence of modification. However, the perforation was poorly located, possibly too near to one edge, so that it broke during manufacture. Instead of being abandoned, the piece was reworked. This took the form of roughly obliterating the first series of incisions by scraping, cutting a second series further down the root and the making of another perforation again further down the root, so that there was less likelihood of it being too close to one edge.

The presence of green staining was observed in the perforations of certain teeth from Kendrick's Cave, which may have resulted from contact with copper sometime during the history of these pieces.

Function

(i) Traces of Use

The majority of these pieces were chipped or broken, often across the perforation, which would have been the weakest part of the tooth.

(ii) Use

It is probable from their shape that these pieces were worn in groups as beads or singly as pendants, or else they may have been sewn onto garments, either as trimmings, or as buttons. There are numerous ethnographic parallels for these forms of use, for example among the North West coast Indians (see Stewart 1973,144). Archaeological evidence for the trimming of garments with perforated teeth and shells takes the form of deliberate arrangements of such teeth and shells in rows or other groups

on human skeletal remains for example across the forehead or the legs. Such evidence has been recovered from the Upper Palaeolithic burials at Grimaldi in Italy (Obermaier 1924,127) and at Brno in Czechoslovakia (Breuil 1924,549), and also at the Mesolithic cemetery at Vedbaek in Denmark (Albrethsen and Brinch Petersen 1975,190). At Saint-Germain-La-Rivière (Gironde), a woman's skeleton was discovered in a Magdalenian layer, with seventy perforated deer canines, probably once having been strung as a necklace, arranged around the throat, of which forty-four bore transverse, oblique and crossed incisions (Müller-Karpe 1966, 283, T131, E2).

It is suggested by Sieveking (1971,247) that the perforated teeth from both Kendrick's and Paviland may have been grave goods deposited with the human skeletal remains in those caves. This is certainly probable for Paviland, but is less certain for Kendrick's, where less is known about the context of the teeth.

Variation and Distribution

The perforated teeth studied here vary in length from 1.05 to 5cm, but as many of them are broken, this does not paint a true picture of their range of sizes. They were of course selected on the basis of their natural dimensions rather than having been made to measure. The dimensions of their perforations, where they could be measured, are more representative: they varied in length from 0.15 to 0.4cm and in width from 0.1 to 0.6cm.

The teeth from Paviland are most probably of Upper Palaeolithic age, as they were found amongst artifacts dating from various stages of that period. By contrast, the Kendrick's teeth come from a site bearing a vast range of contents, including human skeletal remains, Neolithic and later material and a decorated horse mandible (see Sieveking 1971), which has been radiocarbon accelerator dated to 10 000 ± 200 years BP (OxA-111)

(Gillespie et al. 1985,238). The teeth could have been associated with any of these items, but they do resemble known Upper Palaeolithic specimens and there is no reason why they should not belong to this category. The tooth from Kent's Cavern was found by Pengelly amongst disturbed deposits (Garrod 1926,47) and so it could be of Upper Palaeolithic date, but this is not certain.

Coléoptère 28 was found in an Ahrensburgian deposit (Hamal-Nandrin et Servais 1925,5); however, the attribution of the other Belgian perforated teeth is a lot less clear. Goyet 1 was found in old spoilheaps by Hamal-Nandrin in 1904 (Dierick 1958,80) and so provides no contextual information. Of the other Goyet teeth, one is labelled '2e niv.', which might indicate an Earlier Upper Palaeolithic date, but this can hardly be regarded as certain owing to the amount of mixing of material from that site: the other three Goyet teeth were found during excavations by the Institute of Natural Sciences in the 'Salle du Mouton' and have been attributed to the Aurignacian. As regards the teeth from Spy, Otte (1979,595) has suggested that in general perforated teeth were more a feature of the Aurignacian than of the Perigordian, though this is difficult to determine in the case of an individual site as complex as Spy.

The distribution of perforated teeth in the area of this study is of course vastly greater than the small number considered here might suggest. On display in the Institute of Natural Sciences in Brussels were a further eighty-three perforated teeth from the sites of Chaleux, Trou Magrite, Goyet and Spy, which include fox and deer canines, and incisors, probably of horse. None of these teeth were decorated.

Two perforated fox canines were found at Gough's Cave, one of which came from a Later Upper Palaeolithic layer, while the other came from a level containing a mixture of Upper Palaeolithic and Early Iron Age

material (Parry 1928,113-114). A further three perforated teeth were found on the Later Upper Palaeolithic site of Aveline's Hole (Davies 1925,107), as well as two deer incisors modified in another fashion, "one has a shallow groove cut into the root; the root of the other is notched"(1925,107). A further eighteen deer incisors were found in the cave associated with human remains; they were not humanly modified. I have not examined these teeth, because those from Gough's are being studied by other researchers, while those from Aveline's were destroyed during the Second World War.

It is clear that perforated teeth were a regular feature of the Upper Palaeolithic, but decorated examples seem to have a more restricted distribution. Sieveking (1971,237) indicated that he knew of no decorated, perforated teeth from Britain, other than those from Kendrick's Cave; however, I have been able to find a description of at least one other example from another British site. This was a damaged horse incisor found with the human remains at Aveline's Hole; it appeared to have been perforated by rotation from both surfaces and,

> "the root was engraved with at least two series of parallel marks made by a burin or some allied instrument" (Davies 1925,107).

The drawing accompanying the text, which is reproduced here (fig.6:9), shows that the modification to this tooth was very similar in appearance to that on the Kendrick's teeth. A second possible example came from the Later Upper Palaeolithic site of King Arthur's Cave. It is a perforated incisor, which shows in the drawing (Hewer 1925,225 Fig.3, No.15 and 15a) what appears to be a group of transverse incisions beside the perforation on one surface and little, transverse incisions round the edge; however this could be a feature of the method of drawing, particularly as there

is no mention of decoration in the text. This piece seems to have been destroyed during the Second World War (Campbell 1977:I:5).

Sieveking suggested (1971,237-238) that decorated, perforated teeth were generally a characteristic of the Magdalenian of South West France and North East Spain and that the examples from Kendrick's Cave were either imported from that region or that they were locally made as part of that tradition. The latter theory seems the more probable to me, particularly in view of the discovery of at least one other decorated, perforated tooth in the British Upper Palaeolithic and also because good parallels for these pieces may also be found in the Belgian Upper Palaeolithic.

In the Musée Archéologique in Charleroi, there is a 'necklace' of thirteen perforated teeth (Debaille 1944-45,15), consisting of 12 bovid incisors and 1 deer canine, all of which have been perforated through the root and decorated with transverse and oblique incisions. They were bought by the museum and were believed (Debaille, op.cit.5) to have come from Goyet and from the 'premier niveau' in particular, though mainly because many perforated teeth were found by Dupont in that layer (1872,119), including twenty-six teeth associated with two perforated pieces of bone deposited in the form of a necklace. They are described as Magdalenian by Debaille, no doubt because they resemble known Upper Palaeolithic pieces, such as an example from Laugerie-Basse (Dordogne) (de Mortillet 1903, Pl XXIII,186) and because they may have come from the top of the sequence at Goyet. The former reason would certainly be the better one, as the context of these pieces is uncertain: no other incised teeth are known from Goyet. Lejeune (1984, 223-224) clearly accepts these pieces as being Magdalenian probably for the reasons outlined above, but it seems to me that there is an alarming circularity about the argument. The photographs of the Goyet teeth (Debaille 1944-45,15; Lejeune 1984,225,Fig.110) show that the roots

have been smoothed down prior to perforation and that those teeth on which the transverse incisions are parallel and do not actually cross, are very similar to the teeth from Kendrick's Cave. According to Lejeune (op cit.,225), the number of incisions on each tooth varies from five to twenty-nine. It was not possible for me to examine these pieces myself, owing to constraints on time and money.

The evidence outlined above, unsatisfactory though much of it is, leads me to conclude that plain, perforated teeth are a feature of the Upper Palaeolithic in general in the region of this study and that examples decorated with transverse incisions may be a specifically Later Upper Palaeolithic phenomenon.

Perforated Shells

These are shells which have been perforated either for suspension, or for sewing onto hides as decoration. They constitute a very common decorative type in the European Upper Palaeolithic; to give only a few examples, they were found at Petersfels (Müller-Karpe 1966,T193), at Pincevent (Leroi-Gourhan et al. 1976,1334) and at La Madeleine (de Mortillet 1903,Pl XXIII,188). Eight perforated shells will be considered in detail here:

Table 6:6
Number and Distribution of Perforated Shells

Site	Species				
	Turritella	Dentalium	Bayania(?)	Natica(?)	Glycemeris
Coléoptère	1	-	1	2	1
Verlaine	2	1	-	-	-

These pieces were examined for traces of manufacture, but few were found, as only the minimum of modification is needed to turn shells into simple pendants or beads. There was no débitage and only a few shells showed traces of preparation on their surfaces prior to perforation. The methods of perforation used consisted of either drilling or percussion. It is probable that perforated shells were worn as pendants or beads, or that they were used to trim garments. Such pieces are found throughout the region of this study, but one interesting distinction was observed between areas where contemporary shells were collected from the sea shore (for example Britain, Belgian Creswello-Tjongerian) and areas where fossil shells were acquired probably from Tertiary deposits in the Paris Basin (for example Belgian Earlier Upper Palaeolithic, Belgian Magdalenian and Ahrensburgian). In Belgium, this appears to have been a matter of choice rather than ease of access, because at the same period the Magdalenian groups were obtaining fossil shells from an inland region, whereas the Creswello-Tjongerian groups were collecting contemporary shells (see Dewez 1986).

Manufacture

(i) Débitage

No blank extraction was carried out: shells of suitable size and appearance were simply collected.

(ii) Modification

Three shells showed possible striations and scratches, but these may have been effects of purely natural abrasion. By contrast, on another



Plate 6:3 Perforated shells : Grotte de Coléoptère

three pieces, the area around the perforation had certainly been smoothed down; traces of this process have survived in the form of longitudinal and oblique striations, although such traces visible on one example from Coléoptère may not be genuine because it has been restored. On the tubular shell from Verlaine, there was some possible facetting at one point; this piece showed some pinky-red patches which may have resulted from casual contact with ochre in the deposit.

Most of the shells had one perforation, while two shells from Coléoptère had been double perforated: in one case, on opposite surfaces of the shell, and in the other, on one surface of the shell and on the hinge. The tubular shell has not actually been perforated, but may have been used in the same manner as those which have been deliberately pierced.

There was some variation in the methods of perforation used and in the size and shape of the holes obtained. Six perforations showed the characteristic profile of piercing by drilling; possible tool marks were identified on one hole. In two cases, one from Coléoptère and one from Verlaine, the perforation was roughly square in outline and was probably made by punching a hole and then neatening it: the shell was particularly thin at this point. It was impossible to tell if the perforation on another shell from Coléoptère was artificial or caused by natural damage. The perforations varied in shape from circular, to diamond-shaped to square.

Function

(i) Traces of Use

No traces of use were identified on any of these pieces.

(ii) Use

It is probable that these pieces were strung and worn as necklaces or bracelets, or that they may have been used to trim garments made of skins,

as was observed with North West coast Indians (Stewart 1973,165). Some of the published archaeological evidence for the trimming of garments with perforated shells and teeth during the Upper Palaeolithic is quoted above (see Perforated Teeth).

Variation and Distribution

These shells vary in length from 1 to 2.5cm; their perforations range in length from 0.15 to 0.4cm and in width from 0.1 to 0.4cm. The Verlaine shells formed part of a Magdalenian assemblage, as they come from an occupation of that age, while the Coléoptère shells were also found in a Magdalenian layer (Hamal-Nandrin et Servais 1925,13). All the perforated shells in the small sample I have studied came from the Tertiary of the Paris Basin (Hamal-Nandrin et Servais 1925,23).

The collection of shells seems to have been a common habit in the Upper Palaeolithic. Their extensive distribution includes Paviland Cave, where "two handsfull of small shells of the nerita littoralis" were found by Buckland (1823,88) with the 'Red Lady' skeleton "close to that part of the thigh bone where the pocket is usually worn". Five of these shells are now preserved in the Oxford University Museum in a fragmentary condition and are labelled "Littorina littorea". They are deeply encrusted with red ochre; two of the shells exhibit large holes, but they could not be described as artificially perforated. It is probable that they were deliberately deposited with the 'Red Lady' skeleton at a date which has yet to be confirmed by radiocarbon accelerator dating (see above). Sea shells were found at Pin Hole Cave (Jackson 1967,16) and Mother Grundy's Parlour which did not appear to be humanly modified. While Paviland is a coastal cave today and would have been reasonably close to the sea even during the lowered sea levels of the last glaciation, the Pennine sites are far inland.

Perforated shells seem to have been found in some abundance at the Later Upper Palaeolithic site of Aveline's Hole. Davies described the discovery of these pieces in the first foot level of cave earth, where the biserial barbed point was also found,

> "drilled shells of Neritoides obtusatus, Linn, (Fig 10-2), occurred throughout the layer. The holes were all bored in the same manner, possibly with one of the flint awls. The hole was in the same position with regard to the whorl in every bead found" (Davies 1920-21,69).

Many more perforated shells were found in the second foot level (op.cit.,70) and two or three in the third, which were thought to have rolled down from above. These shells were destroyed during the Second World War. Another perforated shell of Neritoides obtusatus was also found in layer 11 at Gough's Cave (Parry 1928,114).

All of the British examples are of contemporary shells collected from the sea shore, which, as we have seen, was particularly close in the case of Paviland. Similarly, during the Creswello-Tjongerian in Belgium, contemporary shells were gathered from the shores of the North Sea (Dewez 1986,230). However, it appears that fossil shells, probably from Tertiary deposits in the Paris Basin, were deemed more desirable during the Earlier Upper Palaeolithic in Belgium, as well as in the Magdalenian and the Ahrensburgian (de Heinzelin 1973,38; Otte 1979,302; Dewez 1986, 228,230). Perforated shells in the Earlier Upper Palaeolithic were a feature of the Aurignacian in particular (Otte 1984,162), though a small number of perforated shells found at Spy have been attributed to the Perigordian (Otte 1979,302); they were Tertiary shells, either from the Paris Basin, or from the region round Mainz. Two unmodified shells found at Maisières Canal are probably derived from the Tertiary of the Paris Basin (de Heinzelin 1973,38). However, it is on both Magdalenian and Ahrensburgian sites in Belgium that perforated fossil shells from Tertiary deposits in

the Paris basin are found in greatest abundance. The Magdalenian sites include the cave of Chaleux where Dupont found fifty-four such pieces,

> "ces coquilles ont été d'ordinaire trouées artficiellement prés de la bouche, soit par un outil appointé, soit par frottement" (1872,158).

A further three Tertiary shells were found in recent excavations at Chaleux by Téheux (Téheux et Otte 1986,4). During his own excavations at Coléoptère, Dewez added another two pierced shells, one of which had been perforated naturally by abrasion,to the five found by Hamal-Nandrin and Servais and studied here.

The Ahrensburgian is best represented in Belgium by the site of Remouchamps, where approximately forty fossil shells, again from the Tertiary of the Paris basin (Rahir 1920,51), were discovered in a cleft in the wall of the cave, with numerous human remains, mainly consisting of teeth and phalanges. This deposit was interpreted as a burial by Rahir and as a cache of precious objects by Dewez (1973-74,96) which seems more probable owing to the highly selective nature of the human remains. A further two perforated shells were found amongst general occupation débris (1920,50). Dewez recovered another forty-six perforated fossil shells from the same site, some of which were coloured with red ochre.

At Goyet, a 'necklace' of one hundred and eighty 'moules silicifiées de turritelles' (Dupont 1872,119) from the Paris Basin was found in the first layer and thus may be of Later Upper Palaeolithic date.

Most of the shells considered here appear to have been collected during the later part of the Upper Paleolithic and from Belgium, they appear to be particularly prevalent in the Magdalenian and the Ahrensburgian, from which periods many decorative artifacts have been recovered. However, this phenomenon could be to some extent a result of biased sampling, for a greater number of exclusively Later Upper

Palaeolithic sites are considered here than of Earlier Upper Palaeolithic sites. Thus, the majority of the Aurignacian or Upper Perigordian industries studied by me come from multi-period sites, where the stratigraphy and contexts have usually been very poorly recorded, and doubt remains as to which objects belong to which phase.

As a footnote to this section, it may be worth recalling that Otte indicated in an appendix to Campbell's 'The Upper Palaeolithic of Britain' (1977:I:211-212) that two fossil shells found by Dewez in backfill at Spy are most likely to have come from East Anglia, where their nearest outcrop lies. This provides an interesting link between the two areas.

Incised Pieces

Among the British and Belgian Upper Palaeolithic collections studied here, a number of pieces have been identified which bear incisions which were not directly linked with either the cutting out or shaping of the artifact, but appear to have been applied at a later date. The types of incised objects recognised ranged from clearly functional pieces, which include antler rods, for example Chaleux 49 , ivory rods such as Pin Hole 2 and 3, and barbed points, such as Aveline's 1 and Goyet 108, to deliberately produced specimens such as Pin Hole 4 and Magrite 40, which appeared to have no obvious function apart from being decorative. This category also included otherwise unmodified splinters of bone, antler and ivory.

The pieces considered here have been organised into seven groups depending upon the nature of the incised decoration on their surfaces and edges. These groups are listed here and described below:

1/ Pieces with Incised Chevrons

2/ Pieces with Notched Edges

3/ Pieces with Curvilinear Incisions

4/ Pieces with an Incised Lozenge Pattern

5/ Pieces with Simple Incisions

6/ Pieces with Patterned Incisions

7/ Pieces with Elaborate Incised Decoration

No traces of use were identified on these pieces, but this is perhaps to be expected as they do not appear to have been functional objects. Any traces of use which have been recognised on artifacts with patterned incisions which have already been recorded elsewhere are discussed in those particular sections.

The study of these pieces suggested that some were purely ornamental, whereas others may have been numerical records of some kind. It is also probable that the particularly crude, incised fragments may have been the result of casual doodling, or the trying out of ideas, which were then carried out on more carefully produced pieces. The notion that some of these objects were gaming pieces was also considered, as was the possibility that some incisions were marks of ownership.

A consideration of the distribution of these pieces revealed that they varied greatly in age and geographical location, although a clear propensity towards incising osseous materials in the Magdalenian was recognised. The grouped, circular indentations were restricted to the Grotte de Remouchamps and the lozenge pattern to Maisières Canal. Much of the incised decoration considered here consisted of very simple motifs for which parallels could be found elsewhere in the European Upper Palaeolithic (Hahn 1972; Marshack 1979).

1/ Pieces with Incised Chevrons

These are bone fragments with incised chevons or 'V's on one surface (fig.6:10). Three examples have been studied in detail: they are Renard 3, Chaleux 86 and Pin Hole 4.

Manufacture

(i) Débitage

Two of these pieces are just modified splinters, whereas the third, Pin Hole 4, appears to have been deliberately extracted from a rib bone. It has a very regular shape and the traces of débitage include fine, irregular, longitudinal striations and tiny, transverse striations on the sides; there are also traces of cancellous tissue on the lower surface.

(ii) Modification

Both Chaleux 86 and Pin Hole 4 appeared to have been modified by scraping prior to decoration, resulting in various striations which resemble the individual strokes of a stone tool. However, on Renard 3, there were a lot of 'scratches', but no coherent traces of modification.

On one surface of Chaleux 86, there was a row of fourteen oblique incisions arranged in sometimes quite irregular chevrons (fig.6:10). On the outer surface of Renard 3, there was a clear pattern composed of ten oblique incisions. As Fig. 6:10 shows, the pattern consisted of a 'V', an oblique incision, an upside down 'V', two parallel, oblique incisions and two 'Vs', one the right way up and one upside-down composed of three oblique incisions. These traces clearly do not form a regular, chevron design, but are sufficiently like it to be included in this category. Pin Hole 4 is much more elaborately decorated on one surface with five, overlapping chevrons, each of which is composed of many oblique incisions. This is a particularly carefully worked piece.

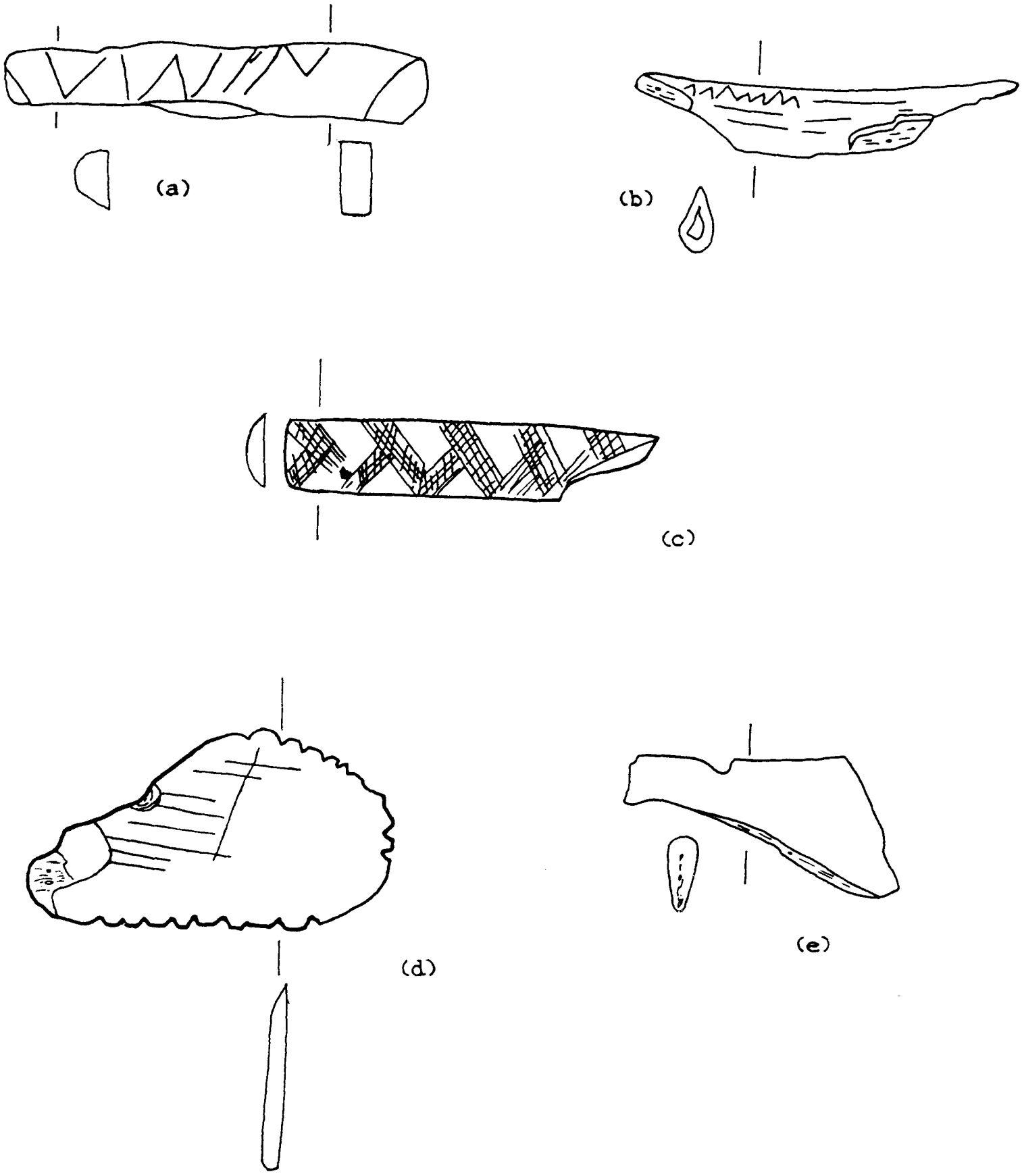


Fig. 6:10 Incised Pieces: (a) Renard 3 (b) Chaleux 86 (c) Pin Hole Cave 4 (d) Church Hole Cave 2 (e) Maisières 26

Function

(ii) Use

Pin Hole 4 has been very carefully produced, which suggests that it was intended to be kept as an ornament of some form, whereas the other two pieces may just represent casual doodling or experimenting on a rough splinter.

Variarion and Distribution

The variation in the dimensions of these pieces provides little information about their original sizes, as they are all broken. Their geographical distribution is widely dispersed, which also seems to be the case for their range of ages. Chaleux 86 and Renard 3 must be Magdalenian and Aurignacian respectively, because they were found on single period sites. Pin Hole 4 has been attributed to the Earlier Upper Palaeolithic by Campbell (1977:II:106).

A further two British Upper Palaeolithic specimens not studied by me are known to have been decorated with incised chevrons. One of these is the horse's mandible found at Kendrick's Cave (see G. Sieveking 1971), which has been radiocarbon accelerator dated to 10 000 ± 200 years BP (OxA-111) (Gillespie et al. 1985,238). This is of course a date for the mandible and not strictly for the decoration, but it seems to be accepted that it was worked when fresh (Sieveking, op.cit.239). Sieveking describes the decoration on the mandible as,

> "four blocks of herring-bone, accompanied by a block of single chevrons placed one above the other" (op.cit.240,241,Fig 5).

The closest parallels to this piece lie in Eastern Europe and Russia (Sieveking, op.cit.243-244) and in particular at the Russian site of Mezin, where a chevron pattern was found on a mammoth scapula. Unlike the specimen from Kendrick's Cave, however, the design had not been incised

onto the bone, but had been applied with red paint. Sieveking commented (ibid) that traces of haematite could be seen in the incisions on the Kendrick's mandible, so this substance may have been used to highlight the design. Clark (1936,162,footnote) notes that the Eskimo would make very finely incised patterns visible by rubbing in some dark substance. This form of decoration may also be seen on plaques of mammoth ivory illustrated by Marshack from the Upper Palaeolithic sites of Eliesevichi and Mezhirich in the Ukraine (1979,Figs. 20,27,34,35). Columns of 'V's observed on pieces of mammoth ivory from Mezin, also in the Ukraine, are illustrated by Boriskovsky (1958,Figs.140,143).

The second British specimen found in the literature is a probably Later Upper Palaeolithic antler rod from Victoria Cave, near Settle in Yorkshire. It is described by Jackson as being ornamented on the upper surface,

> "with three indistinct and fine wavy lines, making a saw-tooth or dog-tooth design" (1945,148).

Decoration in the form of individual 'V's is not unusual in the Upper Palaeolithic (Hahn 1972,256), but their arrangement in rows as zigzags is less common. The incised 'V' has been found both as a single motif and also grouped in both rows and columns on segments of bird bone from Spy (De Puydt and Lohest 1886,21; Otte 1979,306,Fig.127,Nos. 2,3,5,6).

2/ Pieces with Notched Edges

Only two examples of this type have been recognised; they are Maisières 26 and Church Hole 2 (fig.6:10).

Manufacture

(i) Débitage

There were no recognisable traces of blank extraction visible on either piece. This is not surprising for Maisières 26, which is just a fragment of antler with a notch in one side; however, Church Hole 2 is a far more elaborately worked bone artifact, but it is corroded, which may explain the absence of such traces.

(ii) Modification

Church Hole 2 is smooth, though not polished, with some irregular, longitudinal striations on its surfaces; these striations certainly resemble traces of scraping produced in my experiments. Maisières 26 is heavily corroded and exhibits no traces of working on its surfaces.

The edges of Church Hole 2 have been notched by sawing into the bone at regular intervals with a stone tool; 9 notches may be seen on one edge and ten on the other (see fig.6:10). On the broken edge, there is a crushed inward semicircle of bone, which may have resulted from a blow.

Maisières 26 has a deep, wide, transverse notch in one side, within which a number of transverse striations may be seen. It may have been the start of some form of débitage.

Function

(ii) Use

It is most probable that Maisières 26 is unfinished and that the notch represents some form of preliminary working. By contrast, Church Hole 2 is is an interesting and decorative piece, which may once have been perforated and worn as a pendant, and may have broken through use.

Variation and Distribution

It is impossible to compare the original sizes of these two specimens, because Maisières 26 is represented by such a tiny fragment. These artifacts come from two sites which are very distant from each other both

in space and in time. Maisières 26 comes from a Belgian Upper Perigordian site, whereas Church Hole 2 comes from the British Later Upper Palaeolithic. This difference is not surprising, as these two pieces have little in common apart from their notched sides.

Parallels for this form of modification may be found in the Belgian Upper Palaeolithic, but not for these actual artifacts. The pieces in question are the Type g scalloped bead Spy 204 (see Beads) and the notched ivory bead from Spy illustrated by Otte (1979,299,Fig.123, No.35). Another Aurignacian bead with an edge which was regularly notched with transverse incisions was illustrated by Hahn (1972,255,Fig.7:6); it came from the site of Bockstein-Törle in Germany.

3/ Pieces with Curvilinear Incisions

This category includes fragments of bone and ivory, which have decorative, curving incisions on one surface (fig.6:11). Their number and distribution are laid out in Table 6:7 below:

Table 6:7
Number and Distribution

Site Name	Bone	Ivory
Paviland	-	1
MGP*	2	-
Maisières	1	-
Goyet	1	-
Verlaine	1	-
Remouchamps	1	-

* Mother Grundy's Parlour

As may be seen in Table 6:7, all of these pieces are splinters of cortical bone with the exception of Paviland 19 (fig.6:11), which is a flat piece of mammoth tusk. In common with much of the ivory from Paviland, this piece shows traces of red ochre on its surfaces.

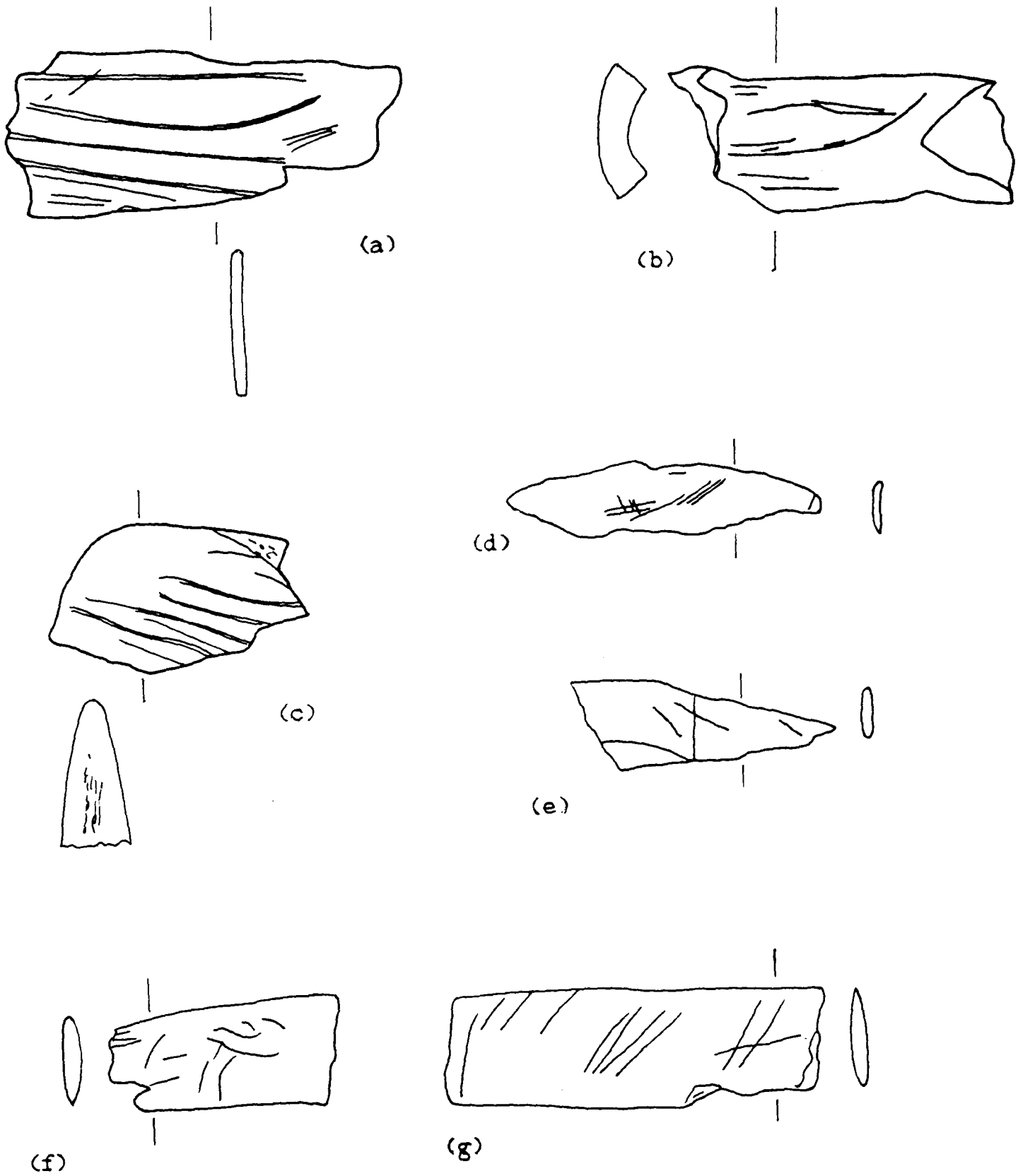


Fig. 6:11 Incised Pieces: (a) Paviland 19 (b) Verlaine 29 (c) Mother Grundy's Parlour 1 (d) Verlaine 32 (e) Verlaine 24 (f) Pin Hole Cave 16 (g) Pin Hole Cave 17

Manufacture

(i) Débitage

No traces of blank extraction were recognised, with the exception of some longitudinal facets on Remouchamps 2, but this was to be expected as these pieces are all fragmentary.

(ii) Modification

On the upper surfaces of all of these pieces, a number of curving, longitudinal and oblique incisions could be seen. A closer inspection of these wide incisions revealed that they were composed of grouped striations. These incisions did not seem to be associated with the modification of the whole surface, and I believe them to have been decorative.

Function

(ii) Use

It is impossible to tell how these pieces were used, because they merely consist of fragments. They may have either come from modified pieces of raw material, or else from deliberately extracted pieces, which may have been designed for some form of use apart from being incised.

Variation and Distribution

The variation in the sizes of these specimens is of little significance as they are all broken. Their distribution is widely scattered both geographically and chronologically. Maisières 28 and Verlaine 29 (fig.6:11) are known to have come from Upper Perigordian and Magdalenian occupations respectively, as they were found on single period sites. Goyet 15 comes from a complex multiperiod site and as its exact provenance is unknown, it is impossible to attribute it to any particular Upper Palaeolithic industry. Mother Grundy's Parlour 1 (fig.6:11) and 4 come from a Later Upper Palaeolithic site in Derbyshire, while Paviland 19 comes from a cave in South Wales which contains a series of Upper

Palaeolithic occupations. The ivory industry at Paviland has yet to be securely dated, though I am hoping to obtain a radiocarbon accelerator date from a part of a mammoth tusk, which is known to have been associated with tool making (see Pendants).

It is hardly surprising that these artifacts have such an extensive distribution, because they are very simple pieces, consisting of just bone and ivory splinters with some curving incisions. Hahn (1972,256) identified "deeply engraved convex lines" among his Aurignacian motifs from Central and Eastern Europe, but these seem to be more formally arranged than those described here.

4/ Pieces with a Lozenge Pattern

This category includes five fragments of ivory found at the Upper Perigordian site of Maisières Canal, which had been incised with a lozenge pattern, made up of regularly crossing oblique lines (fig.6:12). These incised fragments are among the few decorated objects which can definitely be attributed to the Upper Perigordian (Otte 1979,623; Lejeune 1984,216-217).

Manufacture

(i) Débitage

These are just broken splinters, so any signs of débitage will have been lost.

(ii) Modification

Probable traces of preparation on the incised areas were identified in the form of little striations visible between the incisions. Signs of the preparatory process were particularly clear on Maisières 8, where the incised area forms part of a surface which is mainly unmodified and for the most part exhibits shallow, natural corrugations, whereas the incised area has clearly been smoothed down prior to ornamentation. A number of

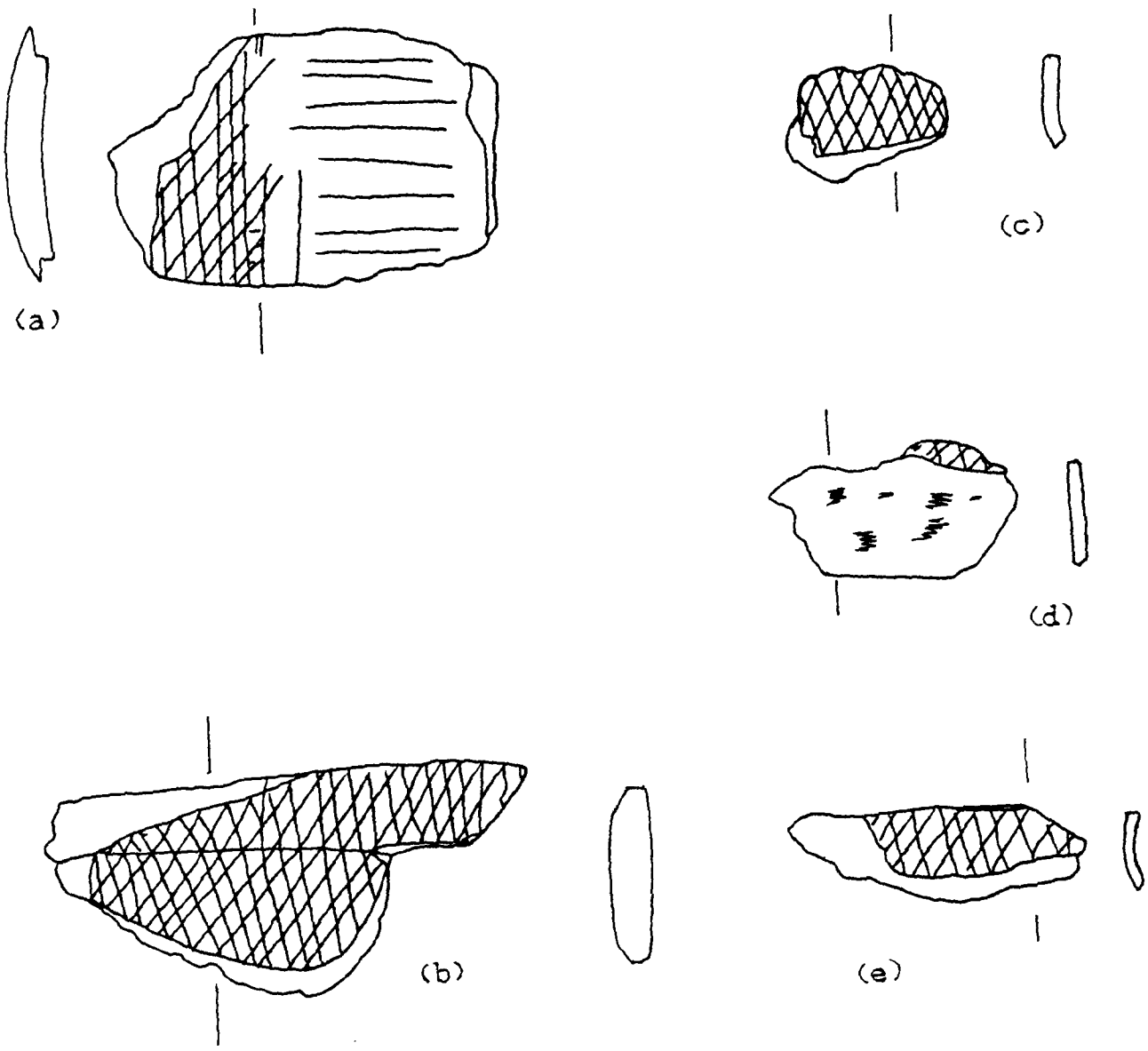


Fig. 6:12 Pieces with a Lozenge Pattern: (a) Maisières 8 (b) Maisières 24 (c) Maisières 37 (d) Maisières 23 (e) Maisières 22

small, parallel, longitudinal striations are visible in this area. A couple of transverse incisions may be seen at the dividing line between the decorated area and the unmodified part of Maisières 8; these may be interpreted as boundary markers.

All five pieces of ivory exhibit on the upper surface a geometric design composed of regularly crossing oblique incisions (see fig.6:12), which form a network of lozenges. The points at which the lines crossed varied from every 0.05cm to every 0.55cm. De Heinzelin, who has studied these pieces in some detail, indicated (1973,33;1973a,297) that the incisions cross on average at approximately 2mm intervals, but this figure suggests that the designs are more uniform than they actually are. Only Maisières 8 is polished, but it is better preserved than the other specimens. Maisières 37 shows a reddish-brown discolouration which has probably resulted from the action of fire.

De Heinzelin has made a detailed study of these pieces and has concluded that they show the knowledge of quite sophisticated, geometric notions such as the right-angled triangle and also that they imply counting, most probably on base 5 (1973,33-34). This is because de Heinzelin envisaged these patterns as having been produced by drawing right-angled triangles and then dividing them up into repeated units along each of two sides, one of which is the hypotenuse, and then incising parallel lines from those units (see de Heinzelin 1973,33;1973a,298). This is possible, but it is perhaps unnecessarily complicated, for instead of drawing triangles, this pattern could have been made by carefully criss-crossing oblique lines, possibly using a straight edge to guide the stone tool.

Function

(ii) Use

Maisières 8 is curved in profile, which may just be a natural result of it having been cut out of a tusk, however, it should be noted that it is quite similar in general appearance to Maisières 7 and 31, described in some detail above (Chapter 5: Miscellaneous:4), which were identified by de Heinzelin as parts of containers. In common with those pieces, it is not clear to me to what type of artifact Maisières 8 belonged. The other four pieces are so fragmentary that it is impossible to tell whether they were parts of purely decorative plaques or fragments of utilitarian objects which had received an elaborate form of incised decoration.

Variation and Distribution

The lengths and widths of these pieces can reveal no information about their original sizes, as they are all broken, however, their thickness may be more useful, when considering how many artifacts these fragments represent. They range in thickness from 0.4 to 0.75cm; Maisières 22 and 23 may belong together as they are particularly similar in appearance and because they are both 0.4cm thick.

No other objects with this specific form of incised decoration have been identified in either the British or the Belgian Upper Palaeolithic. As was suggested above, it is probable that the Maisières pattern could have been produced with very neat criss-crossing oblique incisions based on the 'X' motif, which is known on other Belgian Upper Palaeolithic artifacts. These include the ivory ring from Grotte de la Princesse (see Ivory Rings) and bird bone segments, also thought to be of Aurignacian date, from Spy and Goyet (De Puydt and Lohest 1886,22; Otte 1979, 306,Fig.127, No.2,413,Fig.181,No.14). One of the specimens from Spy was found to have been deliberately filled with powdered red ochre (De Puydt and Lohest 1886,22).

In 1973, de Heinzelin indicated that he knew of only one published piece which was comparable to the specimens from Maisières,

> "it is described as an ornamented piece of a spear of mammoth ivory, and it comes from Yudinovo in Byelorussia...The lozangic decoration is regular and encircles the spear" (1973a,298).

This example appeared to be of Eastern Gravettian date.

The 'X' motif has been identified in the Aurignacian of Central and Eastern Europe (Hahn 1972,256). As well as individual 'X's, a whole network of 'X's may be seen on the body of an animal statuette made of mammoth ivory from Vogelherd IV in Germany (Hahn 1972,262, Plate 8:8). This network forms a pattern composed of lozenges, which is very similar to that seen on the examples from Maisières, although it belongs to the Aurignacian instead of the Gravettian.

Networks of incised lozenges from the Upper Palaeolithic in the Ukraine are also illustrated by Marshack, which are much cruder than the Belgian examples, but are, to my mind, still comparable. This form of decoration was incised on pieces of mammoth ivory from Timonovka and Eliesevichi (1979,Figs. 3,4,5,34,36,37). Some of these examples look as if they may have been made from interlocking zigzags rather than with oblique lines, for they are quite irregular.

A similar pattern (= motive u) was identified by Clark (1936,169,Fig.60) in the Maglemosian, which is listed by him (op.cit.170) as 'cross-hatched lines'. His 'net pattern' (= motive n) is more complex.

5/ Pieces with Simple Incisions

This group consists of twenty-eight pieces of bone,antler and ivory, all of which show a number of irregular incisions on one surface (fig.6:11) (see Table 6:8). These incisions do not look like regular traces of modification, nor do they seem to be organised into groups or

decorative patterns. These pieces rarely show signs of débitage and often appear to be unmodified, apart from the incisions on one surface. The artifacts in this group have a widely scattered geographical and chronological distribution, which is hardly surprising because they are very simple and non-specialised.

Table 6:8
Number and Distribution of Pieces with Simple Incisions

Site Name	Bone	Ivory	Total
Verlaine	12	1	13
Chaleux	2	-	2
Pin Hole	2	-	2
Spy	4	3	7
Maisières	2	-	2
Grundy	2	-	2
Totals	24	4	28

Manufacture

(i) Débitage

A number of pieces show what may be traces of blank extraction by longitudinal sawing in the form of longitudinal grooves or facets; they include Verlaine 17 and Spy 229. Other specimens exhibit typical traces of sawing and snapping at one end for example Pin Hole 16 and 17 (fig.6:11), or at both ends for example Spy 185. Owing to its regular shape, Chaleux 105 may have been produced by the groove and splinter technique, but this is not certain, as it is quite corroded. Spy 141 may also have been deliberately cut out.

(ii) Modification

Only eleven specimens show possible, limited traces of modification, apart from the incisions. Most of these traces consisted of striations running in various directions, as well as some facetting. Particularly fine striations could be seen on Verlaine 14. The majority of these traces were probably associated with scraping.

The incisions visible on these pieces showed few traces of organisation and appeared to have been produced with little care; they are, however, distinguishable from casual damage or butchery marks. The following simple motifs were recognised; sometimes more than one motif was identified on one piece:

Table 6:9
Classes of Simple Incision

Single Longitudinal Incision	1
Single Transverse Incision	3
Single Oblique Incision	3
Longitudinal Incisions	1
Transverse Incisions	9
Oblique Incisions	12
Grouped, Parallel, Longitudinal Incisions	-
Grouped, Parallel, Transverse Incisions	9
Grouped, Parallel, Oblique Incisions	12
Cross Motif	3
Criss-crossing Oblique Incisions	2

As Table 6:9 shows, longitudinal incisions were very rarely identified, which may be because most Upper Palaeolithic bone artifacts appear to have been modified in a longitudinal direction, so as to cover a surface most efficiently. It is possible that any later deliberate incisions were therefore made perpendicular to the longitudinal axis, in order to make them more prominent and this may also have been the case for otherwise unmodified splinters. This feature may also be a result of transverse and oblique incisions being easier to pick out compared with the longitudinal examples. The criss-cross oblique incisions visible on Verlaine 14 and Verlaine 32 (fig.6:11) were restricted to a very small part of the splinter and were not comparable with the lozenge designs seen on various pieces from Maisières Canal.

Function

(ii) Use

The casual incisions present on the majority of these pieces may represent some form of crude decoration, or else they may be a result of

doodling. There are a few exceptions; these include the five deep incisions on one surface of Chaleux 85, which may be associated with cutting and sawing, rather than with decorative modification. The transverse incisions visible at both ends of Spy 185 may have been associated with the removal of the ends by sawing. However, the other three transverse incisions on the shaft were probably decorative.

It is suggested for certain flat pieces with particularly random incisions, such as Verlaine 41, and Pin Hole 16 and 17 that these traces may represent preparation of the bone surface prior to making an engraving, like those deep striations visible both beneath and around the horse's head on Robin Hood's 2 (see Representational Art). Other examples may have been gaming pieces; this possible Upper Palaeolithic activity is discussed in greater detail below.

Variation and Distribution

The variation in the sizes of these specimens is of little significance, as they are all broken, with the exception of Spy 185. Table 6:8 shows that a large number of these pieces come from the site of Verlaine, and we can therefore see them as an illustration of the Magdalenian habit of scratching and incising bone splinters with stone tools. This frequent incising is a characteristic of every Magdalenian assemblage considered here.

These simple pieces have a widely scattered geographical and chronological distribution. The incised bone and ivory fragments from Verlaine and Chaleux come from Magdalenian occupations, while one incised bone splinter was found at the Ahrensburgian site of Remouchamps. The two pieces from Maisières Canal must belong to the one, Upper Perigordian, occupation of the site. The examples from the Grotte de Spy are much harder to attribute, because they come from a complex, multiperiod site;

however, Otte has suggested that they belong to the Aurignacian on the basis of parallels with single period sites (1979, 160-162,311-312).

The two British examples from Pin Hole Cave cannot definitely be attributed to any particular period, but the specimen from Mother Grundy's Parlour must belong to the Later Upper Palaeolithic (Campbell 1977:I: 177).

This is such a simple type of artifact, consisting of a few incisions on a bone splinter, that it is bound to occur frequently in the Upper Palaeolithic, wherever there is regular modification of bone. However, the crudeness of this type suggests that it was unlikely to be regularly recovered or even correctly identified by early excavators. The presence of various simple incised motifs in the Aurignacian of Central and Eastern Europe is discussed by Hahn (1972,255-256); they include arrangements of incisions like those seen here, such as deeply incised, horizontal lines, 'X' signs and parallel, oblique incisions. The last named may also be seen on mammoth ivory from the Upper Palaeolithic site of Mezin in the Ukraine (Boriskovsky 1958,Fig.140).

6/ Pieces with Patterned Incisions

Sixty-five examples have been assigned to this category of pieces with carefully organised incisions, which are generally thought to be decorative (see Table 6:10). Some of these pieces are just incised splinters (fig.6:13); however, this category also includes a number of recognised tool types with decorative incisions on their surfaces. They are Spy 211 (Group 3 Point), Coléoptère 21 (Group 1 Point), Grotte de la Princesse 5 (Ivory Ring), Grotte de la Princesse 3 (Pendant), Goyet 20 (Type (b) Ivory Rod), Goyet 65 (Group 4 Point), Magrite 25 (Group 4 Point), and Verlaine 13 ("Whistle"). These artifacts have all been described already in some detail.

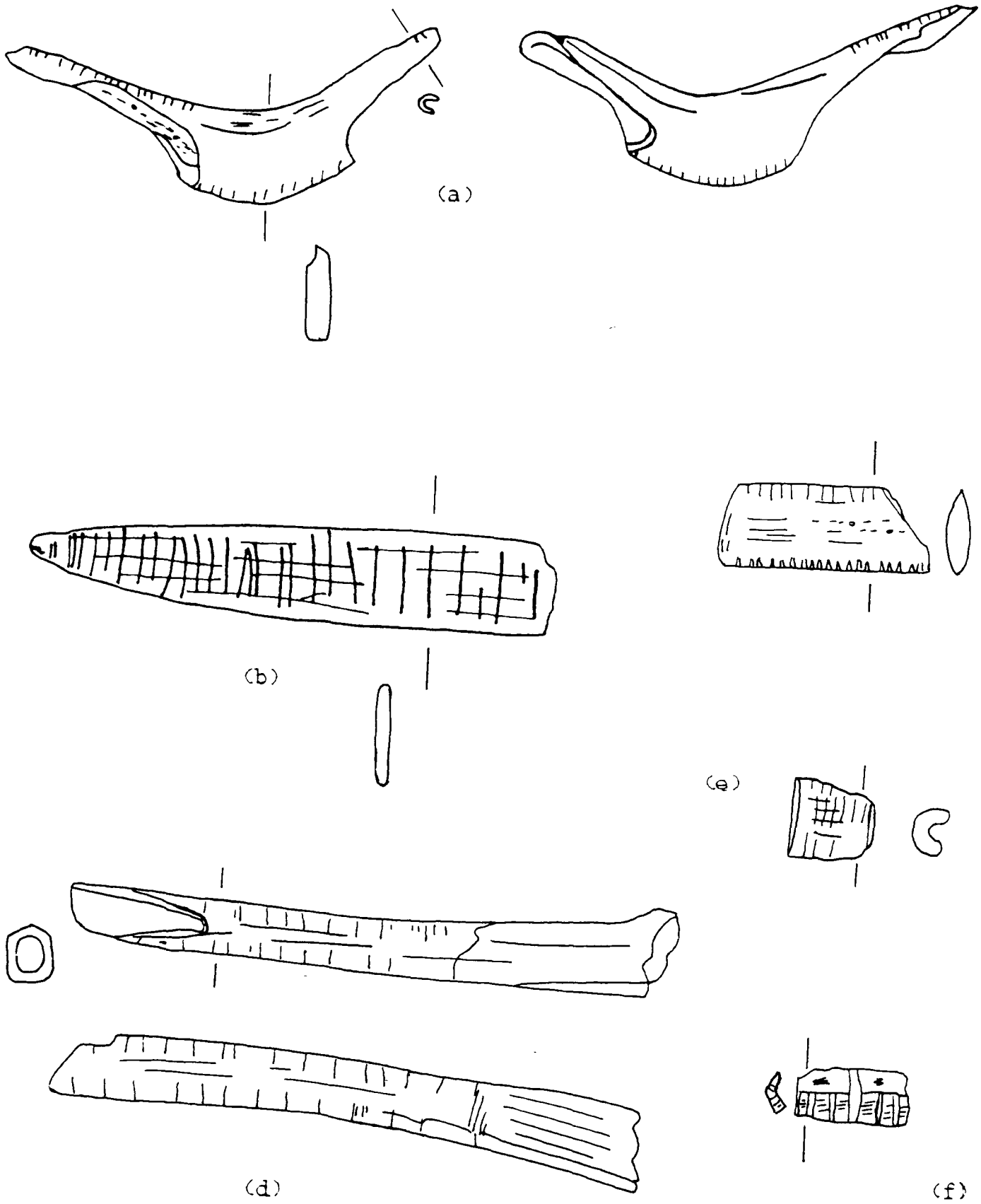


Fig. 6:13 Pieces with Patterned Incisions: (a) Verlaine 28 (b) Goyet 6 (c) Goyet 125 (d) Goyet 131 (e) Spy 200 (f) Spy 223

Table 6:10

Number and Distribution of Pieces with Patterned Incisions

Site Name	Bone	Antler	Ivory	Bone/Antler	Total
Verlaine	12	-	-	1	13
Goyet	5	1	1	2	9
Maisières	3	-	1	-	4
GdlPrincesse	1	-	1	-	2
Coléoptère	3	-	-	-	3
Forêt	1	-	-	-	1
Frontal	1	-	-	-	1
Spy	13	-	8	1	22
Chaleux	8	-	-	-	8
Pin Hole	1	-	-	-	1
Grundy	1	-	-	-	1
Totals	49	1	11	4	65

Manufacture

(i) Débitage

A number of pieces showed clear traces of blank extraction. The methods used included sawing off at least at one end in fifteen cases, for example Goyet 124 (fig.6:14), Frontal 20 and Chaleux 109. On Goyet 131 (fig.6:13), there were possible traces of preparation for the removal of one end by sawing, in the form of a few deep, transverse incisions. A further thirteen specimens had been produced by the groove and splinter technique; they included Goyet 16 and Magrite 25, while Coléoptère 21 had been produced by longitudinal sawing. Spy 126 and Grotte de la Princesse 5 had probably been cut out.

(ii) Modification

Most of these pieces showed traces of modification on their surfaces, usually in the form of longitudinal striations, facets and chattermarks. This suggests that they were worked by longitudinal scraping.

The following motifs were recognised on these pieces; sometimes more than one motif appeared on one object (see Table 6:11):

Table 6:11
Classes of Patterned Incision

Single Longitudinal Incision	-
Single Transverse Incision	1
Single Oblique Incision	1
Longitudinal Incisions	-
Transverse Incisions	3
Oblique Incisions	3
Grouped, Parallel, Longitudinal Incisions	1
Grouped, Parallel, Transverse Incisions	44
Grouped, Parallel, Oblique Incisions	21
Cross Motif	4
Barbed-Wire Decoration	3
Animal Representation?	1

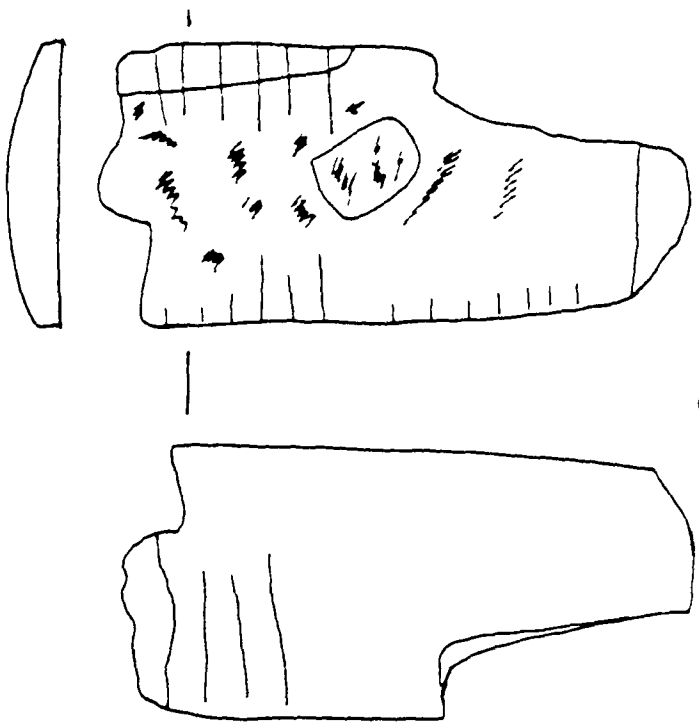
As Table 6:11 shows, only one example of longitudinal working was recognised on these pieces; the possible reasons for this are the same as those outlined above (see Pieces with Simple Incisions). The group of pieces with parallel, transverse incisions included Goyet 131 (fig.6:13), which showed four series of transverse incisions on its shaft; they consisted of two groups of fifteen incisions, one of sixteen and one of eleven, which was incomplete as the bone, a tibia, was broken at this point. The incisions are regularly spaced, which suggests that they may have been more than decorative and that they may have been some form of numerical record or even a ruler. Goyet 125 is more like a modern ruler, in that it is a flat piece of rib with a series of regularly spaced, transverse incisions along each long edge of the lower, cancellous surface. One series consisted of eleven incisions and the other of nineteen (fig.6:13). Spy 112 (fig.6:14) is a very similar piece of incised rib, but in this case, the incisions run right round the piece. A similar feature was observed on Spy 87 and Spy 99.

One particularly striking piece from the same group was a tiny, bird bone from Chaleux, Number 93 (fig.6:14), which was incised with a series of twelve transverse marks on one surface and a series of eight on one side. The series of twelve seemed to be arranged as three groups of four, or as 3-1-4-4, but the last group of four is very faint compared with the

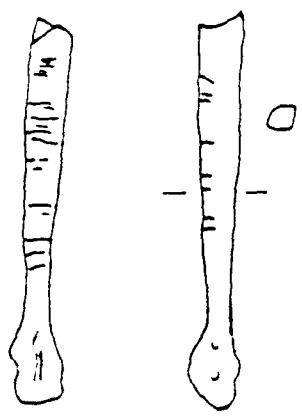
others, which makes it difficult to decide whether all the incisions were meant to form part of the same pattern. The other series appeared to consist of two groups of two, then a single incision and then a group of three incisions. The incisions were quite difficult to distinguish even with a handlens, as they are so small. This would make this piece a rather unlikely candidate to be a ruler or notational system, although Dewez (1979,158-159) has expressed the opinion that a base three numerical system is laid out on this tiny bone.

On Spy 200, which was a fragment of ivory, three groups of transverse incisions could be seen on the upper surface (fig.6:13); they were arranged as two groups of three and one group of six down the middle. This could either have been just a decorative pattern or the representation of some numerical system. Six wide, deep, transverse incisions could be seen on the upper surface of Spy 223 (fig.6:13), which may also have been some form of systematic marking out.

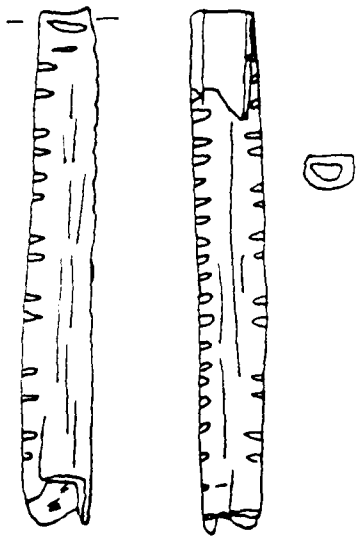
One notable specimen was a piece of rib, Goyet 6 (fig.6:13), which was covered with fine, longitudinal striations on the upper surface and these were cut by a series of about thirty quite regularly spaced transverse incisions. Another interesting piece is Goyet 124 (fig.6:14), which is a bird limb bone that has clearly been sawn off at one end and associated with this process are six transverse incisions at that end. Along each side of the bone, however, there is a series of quite wide transverse incisions, twenty on one side and fifteen on the other. The shorter series is arranged in pairs, while the longer one is composed of equidistant single incisions. This form of incising could be interpreted as marking out for cutting beads (see Beads, Type b), but the fact that each series is arranged differently suggests that this is not the case, for there would be no need for anything other than two series of single incisions. It could have been some form of rule or tally. Verlaine 28 is a curious



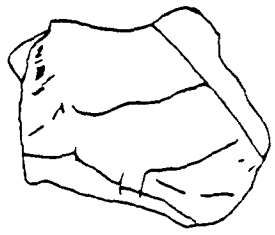
(a)



(b)



(c)



(d)

Fig. 6:14 Pieces with Patterned Incisions: (a) Spy 112 (b) Chaleux 93 (c) Goyet 124 (d) Mother Grundy's Parlour 3

piece of hollow bone (fig.6:13) with three series of tiny, transverse incisions round the edges. The three series consisted of seventeen, fifteen and two incisions, the last of which is incomplete as the bone was broken at this point.

What is described here as 'barbed wire' decoration was observed on Chaleux 101, Spy 168 and Spy 15 (fig.6:15). It consists of a long incision with little adjoining and sometimes crossing transverse and oblique incisions. This feature was also recognised on Coléoptère 14, that is the ivory beetle pendant (see Pendants). A similar phenomenon has been identified by Clark (1936) on Mesolithic pieces (p168,Fig.59,No.5) from Svaerdborg in Zealand; it is described by him, as follows,

> "in a number of cases the art consists of no more than the improvement or accentuation either of cracks or of scars on the surface of the object decorated. Perhaps the best known example of the former is the perforated antler haft from Svaerdborg, in which a crack extending from the end of the haft towards the neighbourhood of the perforation is accentuated by short incisions, some extending right across, others being confined to one edge" (op.cit.,167).

Clark proposed a hypothesis to explain this manner of decoration,

> "both a crack and a scar must be accounted blemishes on an object; perhaps the craftsman sought to nullify them or, as it were, to incorporate them by bordering them with his own handiwork" (ibid.).

Certainly on Spy 15, this feature seems to be associated with a crack in the ivory, while in the other cases, all that can be seen is a longitudinal incison, although it is possible that this may mask a crack or scar in the case of Spy 168, where it is particularly wide and deep.

Mother Grundy's Parlour 3 (fig.6:14) is one of the three fragments of bone picked out by Armstrong (1925,154) from the Base and Middle Zone as bearing the incised representation of an animal. This piece has genuinely been artificially incised, unlike the other two, and the arrangement of

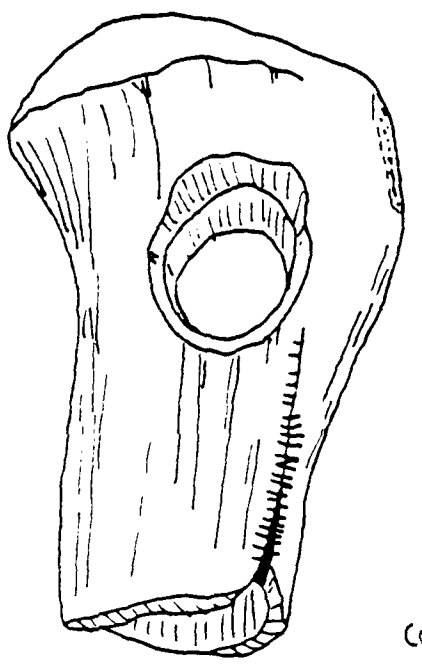


(a)



(b)

(c)



(d)

Fig. 6:15 Pieces with a 'barbed wire' pattern: (a) Spy 168 (b) Spy 15 (c) Chaleux 101 (d) perforated antler haft from Svaerdborg, after Clark (1936,168,Fig. 59,No.5) Scale for (d) is 5:9

the incisions does resemble the head and forequarters of a reindeer, though this is most probably fortuitous.

Function

(ii) Use

Most of these pieces are small fragments and so it is not known what kind of tools they come from, if any: it is possible that they were purely decorative and non-functional pieces. Certain examples may have had some numerical significance as tallies for counting objects or as rulers. The use of notched sticks as chronological records by North American Indians is documented ethnographically (Sollas 1915,483), while tallies were used in Britain until this century for keeping accounts. Clark (1974,140) records the use of marked sticks for keeping the score in games of chance by the Koniag Eskimo. Such games are discussed in greater detail below (see Pieces with Elaborate Incised Decoration).

In the cases of Goyet 20 and Magrite 25, the incisions may have been intended either to mimic the binding used to haft these points, or else to help such a binding to hold. It may also be that some of these patterns of incisions marked ownership, for example the 'X' on the ivory ring from the Grotte de la Princesse, as has been recorded ethnographically (Sollas 1915,466).

In the case of Chaleux 89, some of the transverse incisions near to the sawn off end may be associated with the removal of that end, but this is unlikely to be the case for the other twenty-three transverse incisions on the shaft.

Variation and Distribution

The range of sizes of these pieces is of little significance, as the majority consist of small fragments. As Table 6:10 shows, their geographical distribution is extensive, which is probably also the case for their chronological distribution. The incised pieces from Verlaine,

Coléoptère, Frontal and Chaleux may all be attributed to the Magdalenian, whereas Grotte de la Princesse 5 and the specimens from Maisiéres belong to the Aurignacian and the Perigordian respectively. However, the pieces from Goyet, Spy and Fond-de-Forêt cannot be so securely dated, because they come from poorly recorded, multiperiod sites, although Otte suggests that the incised pieces from the first two sites are Aurignacian (1979,160-162,311-312). This seems to be based on comparisons with purely Aurignacian occupation sites and on the belief that decorated pieces are not found in the Perigordian.

The fragment from Mother Grundy's Parlour must be Later Upper Palaeolithic (Campbell 1977:I:117), but this is not certain for the piece from Pin Hole. This widespread distribution was to be expected, because these pieces do not all belong to a specialised type.

In his study of incised signs in the Aurignacian of Central and Eastern Europe, Hahn (1972,255-256) has identified transverse incisions on the sides and surfaces of objects, oblique parallel incisions, deep, vertical, incised lines and 'X' signs, all of which may be found on pieces of bone, antler and ivory in the region of this study (see Tables 6:9 and 6:11). It is also of interest to note the existence of a series of metapodials of sheep or deer which may have come from Kendrick's Cave, which bear grouped, parallel, transverse incisions on their shafts (Sieveking 1971,235,236,Fig.3). It is entirely probable that these pieces are not of Palaeolithic age and that they do not even come from that cave, owing to the complete absence of contextual evidence, however, they are referred to here because of their striking resemblance to certain Belgian examples such as Magrite 27 (fig.6:17)and Goyet 131 (fig.6:13).

7/ Pieces with Elaborate Incised Decoration

This seventh group of incised pieces consists of eight examples, which bear particularly complex incised designs. Their appearance and the precise nature of their incised decoration vary greatly, so for this reason, they will each be described in turn below.

Remouchamps 1

This is a piece of limb bone, which has been decorated on its outer surface with circular indentations arranged in groups of five, like the five on modern dice (fig.6:16). This particularly attractive artifact was found in 1902 in the Grotte de Remouchamps (Rahir 1920) and forms part of the Ahrensburgian assemblage at that site.

Manufacture

(i) Débitage

Remouchamps 1 was probably produced by longitudinal sawing, because the one surviving side is very regular and is covered with fine, longitudinal striations.

(ii) Modification

Both surfaces and the one complete part of one end are covered with irregular longitudinal and oblique striations, which closely resemble traces of scraping which I have produced experimentally.

Further modification to this piece took the form of seven regularly spaced, transverse incisions on the complete side at the better preserved end (see fig.6:16), while on the edges of that end, twelve very similar incisions may be seen on the upper surface and eight such incisions on the lower surface. These incisions may have been purely decorative, though the presence of the indentations on the upper surface might indicate some greater, perhaps numerical significance.

Towards one side of the upper surface, there is a pattern of round indentations grouped in fives. Within each indentation may be seen a

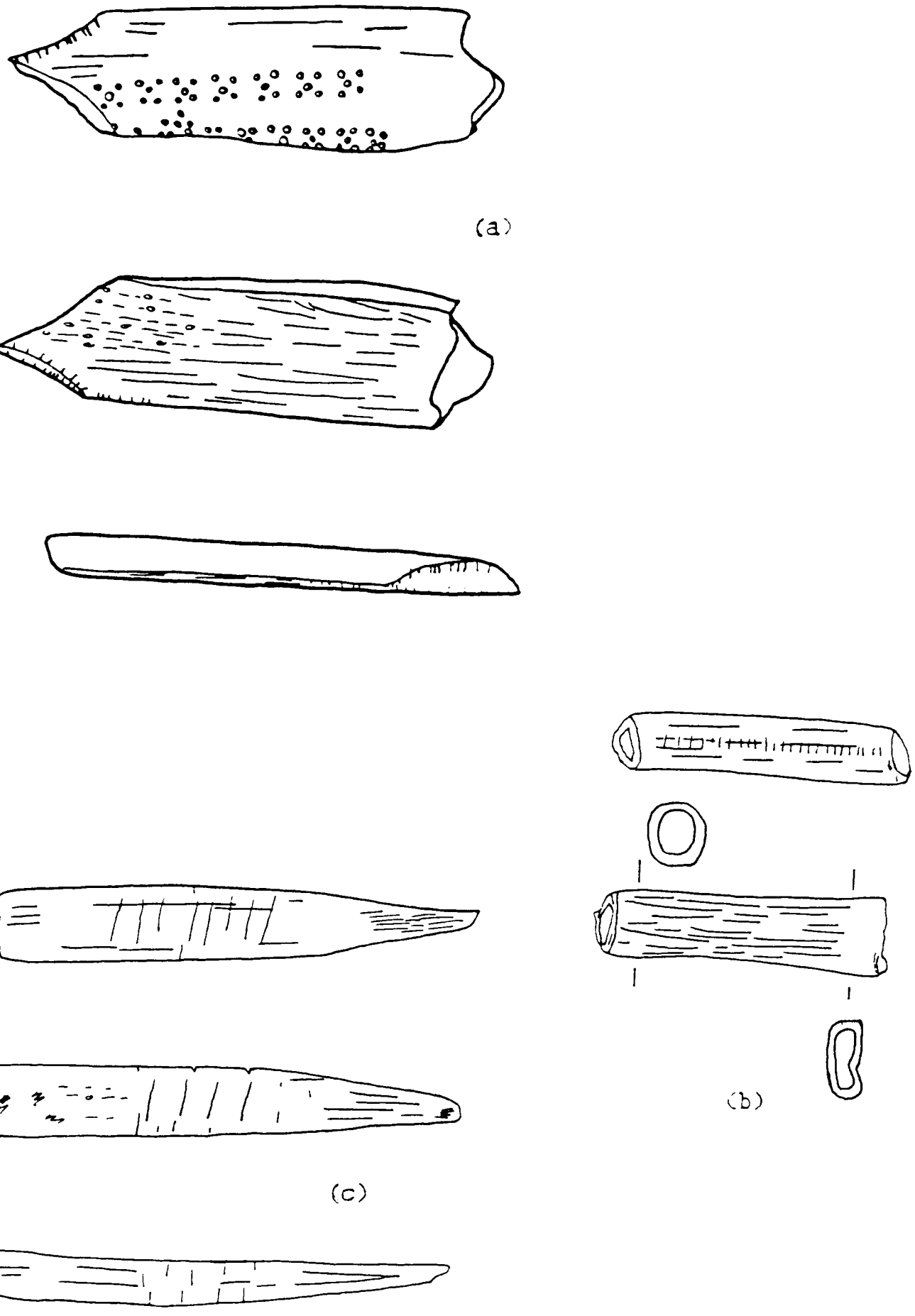


Fig. 6:16 Pieces with Elaborate Incised Decoration: (a) Remouchamps 1 (b) Maisières 9 (c) Trou Magrite 28

round, deeper indentation in the middle, as well as circular marks of drilling. The indentations are often imperfectly aligned within each group of five. The indentations range from 0.15 to 0.05cm in diameter, though the majority measure 0.1cm.

The pattern consists of two rows of quincunxes aligned along the long axis of the piece, with what appears to be a single quincunx just above the row nearer to the edge. It is clear that the upper row consists of a line of seven, regularly spaced quincunxes. The lower row is less easily interpreted, because the groups of indentations are more closely packed and also the piece is broken obliquely across this row. This lower row seems to consist of six well defined quincunxes, then there is a stray group of indentations which lies just above what should have been the seventh quincunx in this row. Whether there was a quincunx under this little group of six indentations is not known, because the bone is broken at this point. It is possible that the lower left indentation in this group formed the top row of a possible eighth quincunx with another indentation visible a little further along the shaft. This would make that group a rather misaligned group of five, which would seem appropriate, considering that all the other groups consist of five indentations. Beyond that, one last indentation is preserved, which probably belonged to the top right-hand corner of a ninth group. This piece is polished all over on both surfaces.

Function

(ii) Use

The function of this very attractive and unusual piece can only be guessed at. It is most unfortunate that this artifact is broken, because it would be most interesting to know whether the incised end was originally pointed. The grouped indentations may have been more than just decorative, for they may represent the laying out of a base 5, or a base

10 numerical system derived from the numbers of digits on the hand. The little transverse incisions may have been related to the indentations, possibly to record multiples of the numbers laid out on the surface. This piece may have been a formal record of the numerical system of the people who inhabited the cave, to which they referred when notching more casual tally sticks when counting, for example animals, fish, skins or beads. The apparent mis-alignment of one quincunx is most curious in view of the fact that the rest of the piece has been so carefully laid out.

Variation and Distribution

To my knowledge, this piece is unique; there is no other artifact like it in the region of this study and no parallels have been found in the literature for the Upper Palaeolithic. Dewez (1973-74,91-92) suggested that there may have been a relationship between this piece and a piece of bone found by him in the same cave, Remouchamps 5, which shows elaborately grouped incisions arranged in groups ranging in number from six to fourteen (see below). This is possible, but cannot be proved.

In 1936, Clark recognised an equivalent form of decoration in the North European Mesolithic composed,

> "of small holes or pits of regular shape, which have evidently been produced by the rotation of a pointed object" (op.cit.,163).

The specimens identified by Clark also included this particular piece. Clark suggests that the regular nature of the pits indicated that they had been made with a bow drill. However, in the case of Remouchamps 1 at least, I am not convinced that such a device would have been necessary. Although Clark's illustration (op.cit.,164,Fig.57) of objects with this form of ornamentation shows that all the Mesolithic examples may have been decorated using a similar technique to that observed on Remouchamps 1, in no case are the drilled pits arranged in a quincunx pattern.

Remouchamps 5

This is a very delicate, thin sliver of cortical bone, which bears complex, incised designs on both surfaces. It is pointed at one end and rounded at the other (Plates 6:4 and 5). This artifact was found in 1971 (Dewez 1973-74) at the Ahrensburgian site of Grotte de Remouchamps.

Manufacture

(i) Débitage

This piece may have been produced by the groove and splinter technique, owing to the presence of longitudinal striations on its narrow edges.

(ii) Modification

Both surfaces are absolutely covered with longitudinal striations made by scraping, prior to making the incisions; longitudinal facetting may be seen on Surface A. On Surface A, there are four groups of transverse incisions arranged alternately along both edges (see Plate 6:4); they are, reading anticlockwise, fourteen, eight, eleven and seven in number. The other surface is incised with a more complex pattern, which contains vertical as well as transverse elements. However, the organisation of the transverse incisions very much resembles that on the other surface, though as a mirror image of the positioning of the four groups (see Plate 6:5). Again reading anticlockwise, the four groups on this surface consist of six, eight, six and eleven incisions, which are oblique rather than transverse in the case of the third group. This surface was also incised with five longitudinal incisions, one of which is cut by five transverse incisions. Some little, transverse incisions may be seen joining with and crossing one of these longitudinal lines towards the pointed end; the effect is reminiscent of the 'barbed wire' decoration seen on Coléoptère 14 and on various bone splinters (see Pieces with Patterned Incisions). It is no doubt important that the basic arrangement, that is the grouping of



Plate 6:4 Remouchamps 5: Surface A



Plate 6:5 Remouchamps 5: Surface B

the transverse and oblique incisions, is repeated on both surfaces: what this actually signifies is another matter.

Function

(ii) Use

The fact that this is such a thin and delicate piece suggests that it was not functional in the sense of having any robust use, for it would have been very easily damaged if it had come into contact with any resistant material.

Dewez, who has carried out a detailed study of this piece (1973-74,1974), has concluded that a numerical system with the base five is incised on the bone. His reasons for this lie in the fact that another piece of decorated bone found at the same site in 1902 (Rahir 1921), Remouchamps 1, had numerous circular indentations arranged in groups of five on its upper surface (see above). Dewez then (1974,399) suggests that the smallest set of transverse incisions numbers five, but this group is to my mind part of the group of eleven incisions on Surface B (see Plate 6:5), though it is true that these five incisions were longer than the six incisions which lay immediately above. However, even if that was a group of five, there is no other identifiable group of five or of any multiple of five on this piece, which casts great doubt on this theory.

In whatever way the incisions on this piece may be interpreted, it does seem clear that the function of this artifact must be closely related to the incisions. Thus, Remouchamps 5 could have been some form of numerical record or score. Dewez makes the interesting suggestion (1974,340) that this piece may have been linked to a game; in support of this, he indicated that certain other non-utilitarian objects were found during his excavations of this site (op.cit.,341), which could possibly have been linked with the playing of games. These include forty-five fossil shells, which could have been used as counters of some form, and a

polished deer astragalus, which resembles modern dice in shape. The throwing of notched sticks as a game amongst the American Indians is also considered by Dewez (1974,342-343), but Remouchamps 5 would not have survived that form of treatment. It is more probable that this unusual artifact is either a decorative piece or a formal, numerical record, possibly recording the score in a game, which was intended to receive little handling.

Variation and Distribution

No other artifact in the region of this study has received this form of incised decoration. An extensive search made through literature relevant to the European Upper Palaeolithic failed to reveal any parallels.

Maisières 9

This is a small tube of bone, which was found at the Upper Perigordian/Maisièrian site of Maisières Canal; it is included within this group because it bears a series of little, transverse incisions on one side (fig.6:16). It appears to have been made from a bird limb bone and is highly polished

Manufacture

(i) Débitage

Maisières 9 was produced by removing both articular ends by sawing and snapping. This process has left clear, mainly transverse striations visible on the outer ring of each end, with a raised area on the inner edge, where the piece has been snapped off.

(ii) Modification

It is marked with transverse incisions, which form a series of approximately twenty-five examples running for almost the full length of one side. My doubt about the total number of incisions is because it is

not always clear whether one is seeing two incisions or one which has been cut twice, in not quite the same place, perhaps because the cutting tool slipped. In the middle, some of the incisions are so shallow that they look like chattermarks. The surfaces are covered with irregular, mainly longitudinal striations, which look like some of the traces of scraping which I produced experimentally, when working bone with a stone tool. This piece is highly polished, which appears to have been an obvious feature when it was found, for de Heinzelin (1973,34) described it as,

> "revêtu de la douce polissure des ossements restés longtemps en usage ou contenus dans une poche de cuir".

The line of short, transverse incisions on Maisières 9 may have been simply decorative or else it may have had some form of numerical significance, as indeed is suggested by de Heinzelin, who sees the series as being composed of approximately twenty-six elements, to which he assigns letters of the alphabet for purposes of discussion. These may be regular incisions, groups of incisions, tiny incisions or in the case of the third element 'c' a gap. At the sixteenth point, which is equivalent to 'p', there appears to be a complex group of incisions, which de Heinzelin interprets as being some form of marker, possibly to signify the end of a numerical sequence, which is probably cyclic in nature. Thus,

> "l'ordonnance et la répétition des traits évoquent un procédé de numération. Mais numération de quoi? Le fait que le groupement des quinze traits de a à p soit délibérément conçu laisse suspecter la notation d'un phénomène de durée connue, vraisemblablement cyclique" (1973,35).

De Heinzelin's hypothesis was that the sequence from 'a' to 'p' represented half of a lunar month. The Celtic Calendar, as described by Piggott (1968,105), provides a possible comparison, for,

> "on sait que le calendrier celte comptait 62 mois lunaires, consécutifs, chacun était divisé en une moitié claire (I à XV) et une moitié sombre (I à XIV ou XV). La pleine lune venant au milieu de la moitié claire tombait selon les mois aux jours VII, VIII ou IX. Telle est ici la position des traits les plus fermes de la série: h,i,j." (de Heinzelin 1973,35).

Thus, according to de Heinzelin's (ibid.) reading of the incisions, 'a' to 'g', with the exception of 'c', are deep, firm strokes, with 'h' to 'j' being especially prominent, thereafter the incisions are shallow and feeble, being more like chattermarks than incisions; presumably they represent the waning moon. What happens after 'p' is not explained by de Heinzelin, though presumably this is equivalent to the last quarter to first quarter of the lunar cycle. It was also suggested by de Heinzelin (op.cit.,35) that the transverse incisions represnted two phases of cutting, with the near obliteration by scraping of the first series, prior to the cutting of the second series. This was not clear to me, but then I was not able to study this piece in the same detail.

I believe that if this were a lunar record, and there is no reason why such things should not have existed, then it would have been more clearly set out. As it is, it is very difficult to discern the variations in the depths of these incisions on which de Heinzelin bases his analysis, without the aid of a microscope. Given the absence of such equipment during the Upper Palaeolithic and the regularity of these traces, I would suggest that they were after all decorative and that they need not be regarded as associated with the primary function of the piece.

Therefore, Maisières 9 is unlikely to have been a tally, as the incisions lie in one series and are not clearly distinguishable from one another. De Heinzelin (1973,34) also suggested that it may have been a whistle, which is certainly possible as he seems to have been able to produce sound from both ends of the piece alternately. A number of Upper Palaeolithic bone 'whistles' and 'flutes' are known in Europe (see Chapter



Plate 6:6 Lapp needle case

5:"Whistles"), however, no example has been recognised which consists of just a bone tube without a hole in the shaft. Although this does not mean that this piece was not used as a whistle, it cannot be identified as having been deliberately manufactured as such.

The shape of Maisières 9 and the techniques used in its production certainly suggest that it may have been some form of container. There are ethnographic parallels for the use by Eskimo and Lapp people during the late nineteenth and early twentieth centuries of hollow or hollowed-out bone, antler and ivory shafts for containing needles. Each needle case contains a length of leather which is folded in the middle and plaited and twisted at the ends, and it is within this that the needles are held. In order to prevent the needle from sliding out of the case, which is of course open at both ends, a large knot may be tied in the leather or else a large bone object such as a ring may be attached. A number of such pieces made in Lappland or by the Western Eskimo, which are held in the Pitt-Rivers Museum in Oxford, were examined by me (Plate 6:6). However, the occupation of Maisières Canal is of Earlier Upper Palaeolithic date, and no needles are as yet known from pre-Solutrean contexts, so that a needle case would not be expected at Maisières. If it did not contain needles, it could perhaps have been used on a similar principle to contain delicate bone pins; indeed one of the three surviving pins in the assemblages considered here comes from the same site, that is Maisières 4. The high polish on Maisières 9 could be interpreted as the result of frequent handling.

Magrite 28

Magrite 28 is a short rod of reindeer antler, which is pointed at one end, and bears oblique and transverse incisions on both surfaces and sides (fig.6:16).

Manufacture

(i) Débitage

The regular shape of this piece and the presence of longitudinal facets and striations on its sides indicate that it was most probably extracted by the groove and splinter technique. One end was evidently made pointed in the original cutting out of the splinter, as no particularly heavy traces of modification are to be seen on the sides at that end.

(ii) Modification

The surfaces are smooth and appear to have been worked by scraping, as typical traces of this process may be seen in the form of chattermarks and striations. On the upper surface, eight very gently oblique incisions may be seen as well as a much smaller ninth incision towards the pointed end; they could actually be grouped as a three, a five and a one, though this may have happened fortuitously, owing to the stone tool having slipped when incising the bone. On the lower surface, four similar incisions may be seen, though in this case they are regularly spaced. Approximately 0.4 to 0.5cm from the last of these incisions towards the pointed end, three tiny transverse incisions may be seen arranged as if at the three points of an equilateral triangle. On each side, there is a design consisting of five transverse incisions, arranged in two rows, one of three and one of two incisions (see fig.6:16). A sixth tiny, oblique incision on one side is interpreted here as a mistake, possibly caused by the stone tool slipping. This piece is very well preserved.

Function

(ii) Use

Magrite 28 could have been used as a gaming piece of some form, with each of the two surfaces having a different value and the two sides the same value. With regard to this, it is of interest that,

> "the earliest known British dice are from Iron Age contexts and are parallelepiped rather than cubical" (MacGregor 1985,129).

These dice had four values instead of six, for they could only effectively land on one of four surfaces and so usually the one and the two were omitted. Clark (1974,140) also referred to a game played by the Chugach Eskimo of throwing an otter humerus, which could land in one of three positions and was clearly a forerunner of dice. Gambling was apparently popular with the Kodiak Eskimo, one form of which is described as follows,

> "a small figurine with somewhat squared sides and base was thrown into the air, and scored according to whether it landed on its bottom, back etc. The score was kept with twenty marked sticks" (ibid.).

This account not only provides a possible parallel for Magrite 28 as a form of gambling piece, it also suggests a function for other incised pieces such as Gough's 7 (see below) as forms of score card. Magrite 28 could also have been used as some form of rule which could be consulted for recording or measuring.

Magrite 40

Magrite 40 is a piece of shed reindeer antler, which bears an elaborate design composed of both curvilinear and straight incisions (fig.6:18). It was one of the first two pieces of Palaeolithic art to be found in Belgium (Dupont 1872,93), the other being an ivory statuette from the same deposit, Magrite 41 (see Representational Art).

Manufacture

(i) Débitage

The antler from which this piece is made must have been naturally shed, as its base is very smooth, but the two lowest tines have been chopped off, leaving deep scars.

(ii) Modification

Only a few striations may be seen on this piece, apart from those involved in the pattern. On the better preserved surface, the surviving decoration consists of three groups of transverse incisions located one along one edge, one above where one tine has been chopped off and one on the surface towards the base of the antler; a group of three oblique incisions may also be seen near to the last group of transverse incisions. In the centre of the piece, there is a design composed of curving incisions, to which in certain areas are adjoined neatly spaced series of short,transverse incisions, like the barbed wire decoration described above (see Pieces with Patterned Incisions). This elaborate design is thought by some (see below) to represent the female genitalia or even both the male and female genitalia! The other surface of the piece is in a very poor condition, though some grouped, transverse incisions as well as some barbed wire decoration could be distinguished.

Various interpretations have been put forward to explain the nature of the design on this piece; these have included the suggestions that it consists of representations of fish, or of a swan or even just a fantastical drawing (see Lejeune 1984,216). Recently, the view that these are engravings of sexual organs has become popular (Otte 1979,166; Dewez 1985,129). However, Dupont, on whose excavations this piece was found, clearly decided that there was little to be gained from worrying overmuch about the meaning of the incisions, which to my mind is a very sensible point of view, given that such a wide variety of views have been expressed

> "cela pourrait entraîner à des discussions sans but utile" (1872,93).

Function

(ii) Use

This piece has no obvious function part from being ornamental.

Variation and Distribution

No other object bearing this form of decoration has been recognised in the Palaeolithic of Britain or Belgium. A study of published information for the rest of the European Upper Palaeolithic has also failed to yield any comparable pieces. This piece has caused a lot of controversy, not only with regard to the incised design on one of its surfaces, but also about its provenance and thus its age.

The argument about the age of this piece and of the little ivory, anthropomorphic statuette, Magrite 41, with which it was found, is of particular interest. This is because it illustrates very clearly the problems involved in dealing with old excavations, even those carried out by people as competent as Edouard Dupont who excavated Trou Magrite. According to Dupont (1872,93), the engraved piece of reindeer antler and the statuette were found "dans la troisième couche ossifère du Trou Magrite". What this actually means is uncertain; Otte's reading of Dupont's brief notes was that the two pieces must belong to the Upper Perigordian (1979,163). This belief was reinforced for Otte by his finding parallels for the statuette with five similar statuettes made of mammoth bone from the Gravettian site of Predmost in Czechoslovakia, although there was also an Aurignacian presence at that site (Breuil 1924,523,543,Fig.23). However, the detailed analysis of Dupont's notes carried out by Dewez (1985,121) seems to point towards the 'troisième couche ossifère' belonging to the Typical Aurignacian. Parallels for the statuette were drawn by Dewez with examples from the Aurignacian site of Vogelherd (1985,126), and as Dewez indicated,

> "personne n'a jamais contesté la contemporanéité des deux objets. Par conséquent, si la statuette est aurignacienne, le bois de renne décoré doit l'être aussi" (1985,128-129).

It seems safest to conclude, as de Sonneville-Bordes did (1961,425), that these two decorative objects from Trou Magrite are of Earlier Upper Palaeolithic date, but that they could belong to either the Perigordian or the Aurignacian.

Magrite 27

The third specimen from Trou Magrite is a hollowed-out metapodial with various series of transverse incisions on its surfaces (fig.6:17). The context and thus the age of Magrite 27 are unrecorded.

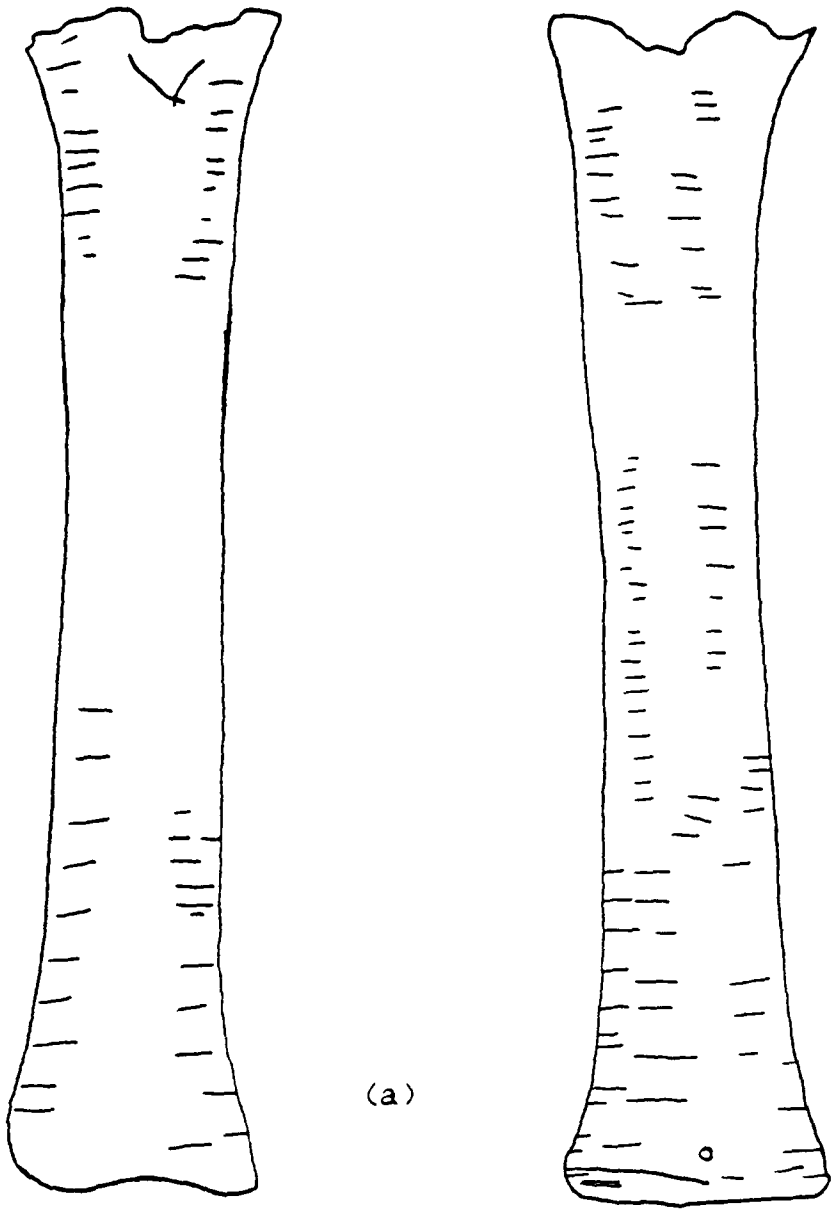
Manufacture

(i) Débitage

Magrite 27 shows the unusual feature that its articular ends have not been sawn off, but rather they have been hollowed-out, probably by scraping away the bone. All the contents of the bone, such as the marrow, would have been removed at that stage, in order to prevent the growth of mould within the bone.

(ii) Modification

Magrite 27 was smooth and appeared to have been worked by scraping, leaving longitudinal and oblique striations on the bone shaft, whose curved surfaces would not have been suitable for shaping by grinding. These striations are cut by twelve series of transverse incisions, which are arranged in groups ranging in number from six to greater than twenty. They are not obviously decorative to my subjective eye, and it therefore seems reasonable to consider whether they might represent some form of tally or score-keeping. This piece is very smooth, which may have come about as a result of frequent handling.



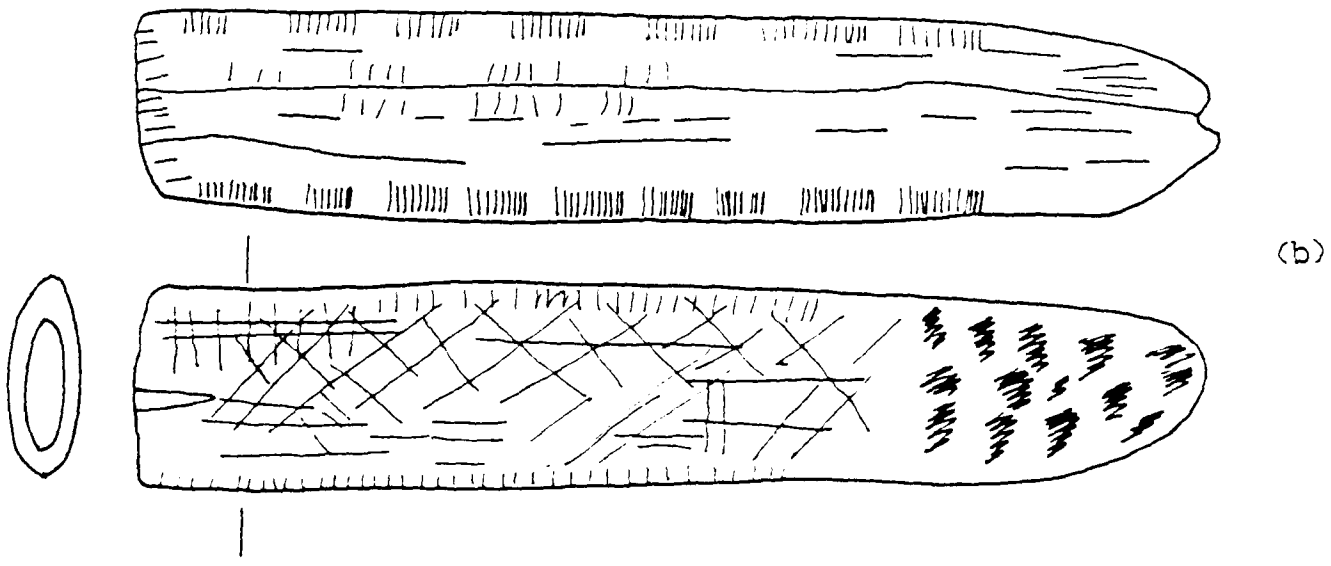


Fig. 6:17 Pieces with Elaborate Incised Decoration: (a) Trou Magrite 27 (b) Gough's Cave 7

Function

(ii) Use

The fact that this bone has been hollowed out might suggest that it was intended for use as a container, perhaps in the manner described for Maisières 9 (see above), although Magrite 27 does seem a little large at 12cm long to have contained needles when the longest surviving Upper Palaeolithic example considered here is 7.55cm long. However, it is possible that some of the fragmentary needles were originally longer than that. The fact that the ends of this piece were hollowed out rather than transversely sawn to produce a neat segment of shaft suggests that this piece may not have been a container, but was purely intended to receive the various groups of transverse incisions on its surface, the reason for hollowing out the ends being to clean out the inside of the bone. Magrite 27 may well have been some form of tally, as the incisions do form clearly visible groups which are not obviously decorative. If so, its precise function remains a matter for speculation. For example, it may have been used as a chronological record for that community, in the manner of the North American Indians noted by Sollas (1915,483). There are many possible interpretations for such traits, but none of them can be proved to be the right one; indeed, there are not even good grounds for deciding which are the more probable.

This category also includes two bone objects from the Later Upper Palaeolithic site of Gough's Cave in Cheddar Gorge. One of them is a Group 2 bone point, Gough's 5, which has already been discussed in detail (see Chapter 4:Group 2 Points).

Gough's 7

The other piece of bone with grouped incisions to be found in the cave was Gough's 7 (Hawkes, Tratman and Powers 1970; Tratman 1976). It is a

broken segment of rib bone which is decorated with incisions and stained with red ochre, some lumps of which are still attached to the flat surface (fig.6:17).

Manufacture

(i) Débitage

This piece has been sawn off transversely, or at least neatened at one end, which is smooth and covered with tiny longitudinal and transverse striations

(ii) Modification

Many irregular longitudinal and oblique striations may be seen on both surfaces, which suggests that they have been worked by scraping. The rounded surface is very smooth, whereas the other surface is rough, with a large lump of deposit still attached to it.

The flat surface shows a very rough network of criss-crossing, oblique incisions, which are not comparable with the pattern seen on the specimens from Maisières. Regular tiny, transverse incisions may be seen running along the edges of the flat surface, like blanket stitch. On the rounded surface, little, transverse incisions are visible along all three edges and are also arranged in groups along a longitudinal axis down the middle of the bone. On this surface, the transverse incisions are organised in groups, which, round the edges, vary in number from six to thirteen, although nine seems to be the most popular. These incisions were difficult to count because not only is there a slight coating of deposit in certain places, but also the incisions have not been made with simple firm strokes, but show traces of cutting and recutting several times. This repeated incising could easily have taken place at the one time and may have resulted from the slipperiness of the bone surface or from the inexperience of the engraver. The transverse incisions along the middle of the piece seem to be particularly worn or else may have been

only very shallow originally, but they are in any case particularly difficult to record (See Hawkes et al. 1970, Plates 14A and 14B).

Function

(ii) Use

It is impossible to know how this remarkable piece was used; however, certain hypotheses may be considered. It could have been purely decorative, though the deliberate grouping of the incisions on the rounded surface might suggest some form of numerical record. One of the many suggestions for the use of this piece made by Powers (1970,141) is that it was a gaming piece, possibly thrown like a dice: this is supported by Tratman (1976,128) who indicated that the damage to this object could be consistent with it being regularly thrown onto the ground. I would suggest that this is improbable, because of the, in that case, unnecessarily complex nature of the incisions visible on both surfaces. If all that was needed was some means of differentiating the two surfaces surely a simpler pattern of incisions would have been adopted, in the manner of Magrite 28.

Powers also put forward the theory (1970,141) that Gough's 7 could have been an all-purpose measuring device; this is not impossible, but if it were the case, I would expect there to be greater consistency in the number of transverse incisions in each group. The interpretation of the incisions on this piece as a numerical record seems the most probable one, either like a North American chronological record, or as a score card in a game (see above).

Variation and Distribution

The incised bone point, Gough's 5, formed part of a series of Group 2 Points found at the cave, although it was the only piece to have received this form of modification. By contrast, no direct parallels for Gough's 7 have been recognised either in the region of this study, or in the Upper Palaeolithic of the rest of Europe, though in its general nature it seems

to have something in common with some of the Belgian pieces described in this section.

This concludes this section on incised pieces, which ranged from broken splinters with a few simple incisions on one surface to carefully produced specimens with sophisticated incised designs. The techniques used in their manufacture were very simple ones, which are regularly encountered in osseous industries. Although the recognition of the methods of manufacture was not a difficult task, the interpretation of the function of these pieces and their incised decoration certainly was. Clearly such a wide range of artifacts and of incised traits would not all have shared the same function. The activities that appeared to be represented by the pieces described here included casual doodling, the preparation of a bone surface for an engraving, numerical recording and perhaps the playing of games, which may have involved gambling and fortune-telling. Incised pieces were found throughout the region of this study and throughout the Upper Palaeolithic.

Representational Art

The objects in this class are pieces of bone, antler or ivory, which have either been engraved with or sculpted into the representation of an animal or a human figure. The specimens described here include two human representations, one of which, Pin Hole 1, was engraved on bone, while the other, Magrite 41, is a small, anthropomorphic statuette. They are the only known human representations in the British and Belgian Upper Palaeolithic, and such pieces seem to be uncommon in the European Upper Palaeolithic as a whole (Leroi-Gourhan 1968,113). The other two examples of representational art are engravings of the head and part of the

forequarters of animals, in one case a horse, Robin Hood's 2 and in the other, a bison, Trou des Nutons 8.

All four pieces were examined for traces of working and it was found that only Robin Hood's 2 showed traces of débitage. The shape of Magrite 41 and the engravings on the other three pieces indicate that they must have been worked by cutting, incising and scraping. The two animal engravings show clear traces of modification to the bone or antler surface prior to making the engraving. It is thought that all of these pieces were designed to be ornamental, or possibly in the case of Magrite 41, a child's toy.

Items of mobiliary art found on nineteenth century excavations are very difficult to date; this is because they are so few in number and because their contexts were not recorded in detail. Magrite 41 and Robin Hood's 2 have been attributed to the Earlier Upper Palaeolithic (Otte 1979,163-164; Dewez 1985,126; Campbell 1977:I:149). By contrast, the specimens from Pin Hole Cave (Campbell 1977:I:174) and from the Magdalenian site of Trou des Nutons appear to be of Later Upper Palaeolithic date.

This category also includes a number of artifacts which have already been described elsewhere in this study, such as the ivory pendant shaped like a beetle from the Grotte de Coléoptère (see Pendants). The two rather doubtful pieces of worked bone from Verlaine could belong here, as one specimen is a pin with a sculpted human head (see Chapter 5:Pins), whereas the other is a pendant shaped like a fish (see Pendants). The decorated, perforated bâton from Goyet could also be included in this category, as it has the representation of a fish on one surface (see Chapter 5:Perforated Bâtons).

Human Representations

Pin Hole 1

This is a segment of rib bone, which bears the engraving of a human figure (fig.6:18). It was found during Armstrong's excavations of the site and was described by him as,

> "an engraved drawing of a masked human figure in the act of dancing a ceremonial dance" (1928-29,28).

Manufacture

(i) Débitage

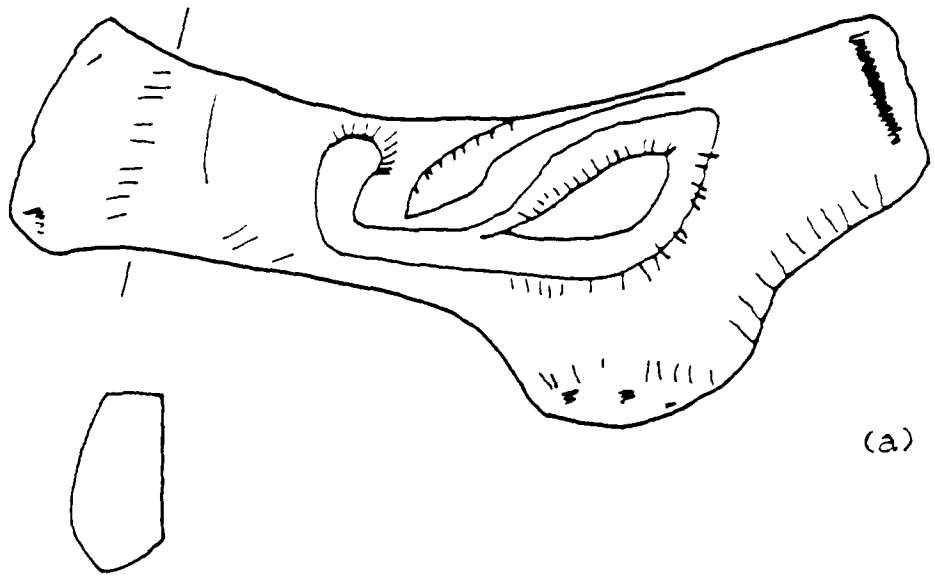
No traces of blank extraction were identified on this piece, which has been transversely broken at both ends.

(ii) Modification

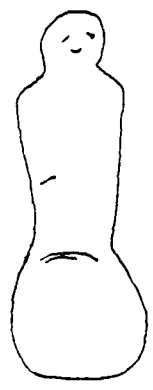
There are a number of both shallow and deep, irregular incisions on both surfaces which may have been artificially produced, but which do not represent regular surface modification. They probably result from the original cleaning of the bone. A few oblique striations may be seen on the engraved surface and two deep, wide, transverse incisions on the other surface, but these traces are the result of casual modification rather than any careful preparation of the bone surface.

The engraving appears to be of an upright male figure with prominent genitalia, which has a curved back and a curiously misshapen head. The right arm is represented as being linked to a transverse line across the waist which extends out in front of the figure, as if it were holding a hooked stick in its right hand. The engraving is composed of incisions 0.2mm wide, within which no individual striations could be seen.

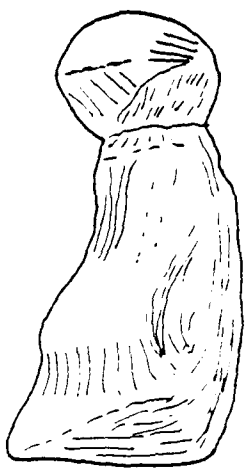
The misshapen head of the figure is interpreted as an animal mask by Armstrong (p28), which it may well have been, as have been interpreted the twenty-one modified stag frontlets found at the early Mesolithic site



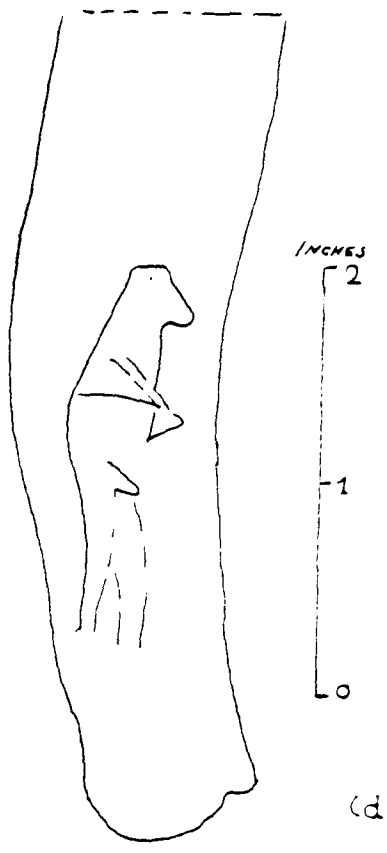
(a)



(b)



(c)



(d)

Fig. 6:18 Representational art and incised decoration: (a) Trou Magrite 40 (b) Trou Magrite 41 (c) statuette from Predmost, after Breuil (1924,543,Fig.23) Scale for (c) is approximately 1:4 (d) Pin Hole Cave 1, after Armstrong (1928,Plate V,Fig.2)

of Star Carr (Clark 1954,168-170). The deer frontlets had deliberately been made lighter by hollowing out the antlers and smoothing away certain features of the inner surface of the skull. Eleven examples had also been artficially perforated. It is suggested (op.cit.,170) that the frontlets were worn on the head and secured with thongs threaded through the holes and were intended either for the practical purpose of stalking red deer or for wearing during some form of ritual dance. Both forms of use have been documented ethnographically (op.cit.,170-171).

Other representations of human figures wearing animal masks are known in the European Upper Palaeolithic, in some cases the type of animal represented is easily identified, such as the part engraving/ part painting of a man inside an animal skin adorned with stag's antlers from Trois Frères, Ariège (Obermaier 1924,233,Fig.103), but in others (including Pin Hole 1), they are very crude, anthropomorphic designs of the kind illustrated by Obermaier from Mas d'Azil, Ariège and Hornos de la Peña, Santander (op.cit.,130,Fig.59). These representations may illustrate the use of such masks either for stalking or in rituals, as described above.

This piece seems to have belonged to the later part of the period considered here (Campbell 1977:I:174).

Trou Magrite 41

This is a crudely shaped, anthropomorphic statuette carved out of ivory (fig.6:18). It was found during Dupont's excavations of the 'troisième couche ossifère' in conjunction with an incised piece of reindeer antler, Magrite 40. They were the first pieces of Palaeolithic art to be recognised in Belgium.

Manufacture

(i) Débitage

The shape of this piece suggests that it may have been produced from a cylindrical blank.

(ii) Modification

Magrite 41 has been roughly shaped to represent a seated or kneeling human figure. It has a round head, with two incisions for eyes and a knob for a nose; it has a neck and sloping shoulders, a trunk and a rounded base. This last feature was necessary to make this piece stable. Few tool marks are visible on Magrite 41, for the surface is discoloured and is not very clean, but owing to its shape, it must have been made by cutting and scraping. There is also a deep incision in the back of the head and a hollow in the base. There is a little indentation in the left shoulder, but the age or purpose of that feature is not known.

This object has been sculpted to resemble a human figure, which is neither overtly male or female. It could have been made as a child's toy or just for fun.

As was discussed above with relation to Magrite 40 (see Pieces with Elaborate Incised Decoration), the cultural attribution of these two pieces from Dupont's 'troisième couche ossifière' has been the cause of much disagreement. It was concluded that there was no doubt that this piece and Magrite 40 must have belonged to the Earlier Upper Palaeolithic, but to which part cannot be proved. General parallels for this piece include the five little, anthropomorphic figurines made from mammoth bones which were found at Predmost in Czechoslovakia (Breuil 1924,543,Fig.23), one of which is reproduced here (fig.6:18).

Animal Representations

Robin Hood's 2

This is a segment of rib bone which bears the engraving of a horse's head and part of its forequarters (fig.6:19). It was found during excavations carried out by the Rev. Magens Mello (Boyd Dawkins 1877).

Manufacture

(i) Débitage

One end of this piece has been broken, whereas the other end has been neatly sawn off from both surfaces. The sawn end is smooth with some longitudinal striations preserved on it. Some transverse cuts, which were no doubt associated with this process, are visible on the rounded surface close to that end.

(ii) Modification

A number of irregular, longitudinal striations which probably result from scraping may be seen on the edges. On both surfaces, there are some regular, mainly longitudinal striations, which are interpreted as having been associated with the preparation of the bone surface prior to engraving. These striations are free of ochre unlike the overlying, much rougher, curving longitudinal and transverse striations, which are filled with a pinky-brown silty deposit. This could just be a result of the deposit being more likely to adhere within the wider striations than within the shallow, narrow striations, rather than ochre having been deliberately rubbed into certain striations. The engraving of a horse's head, neck and mane was incised on the flat surface: the mane was represented by a number of closely packed, short, oblique incisions. The engraving is made up of incisions, which are composed of narrow, sometimes grouped striations; they are also filled with red ochre.

This is clearly a highly decorative bone 'plaque', which was no doubt designed to be ornamental. Robin Hood's 2 was found in a genuinely Upper

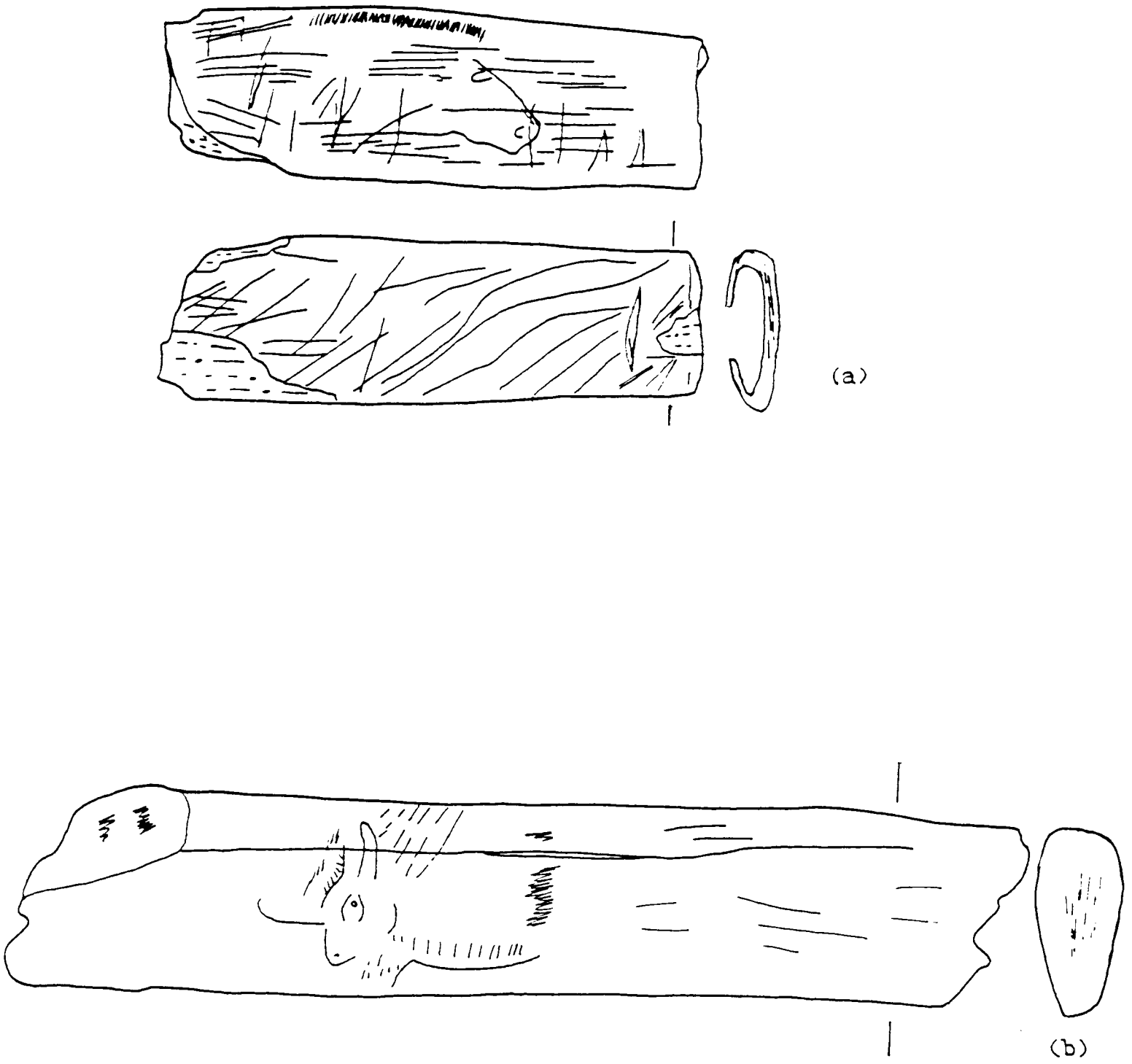


Fig. 6:19 Representational Art: (a) Robin Hood's Cave 2 (b) Trou des Nutons 8

Palaeolithic context, but it is impossible to tell with any certainty to which part of that period this piece belongs. As this object had some red silt adhering to it which was the case for the known Earlier Upper Palaeolithic artifacts, it was tentatively suggested by Campbell that it might belong with that assemblage (1977:1:149).

The only artifact in the region of this study which is similar to Robin Hood's 2 is an engraving of a horse's head on an ancient rib bone found by two schoolboys in 1911 in a quarry at Sherborne in Dorset (Smith Woodward 1914,1926; Elliot Steel 1926; Sollas 1926). Recent research carried out by Sieveking (1980,1981) suggests that this engraving is modern and that it was made on a fossilised bone, in order to create a deliberate resemblance to the piece considered here.

Representations of horses are abundant in the Upper Palaeolithic of South West France and North East Spain in particular, on portable objects as well as in the parietal art. Some of these representations are remarkably detailed; these include the head of a horse carved in reindeer antler from Mas d'Azil, Ariège illustrated by Obermaier (1924,215,Fig,94). More schematic engravings of horses may be seen on a perforated bâton from La Madeleine, Dordogne (Obermaier 1924, 128,Fig.58) and on spearthrowers from Laugerie-Basse, Bruniquel and Isturitz (Garrod 1955,23,Fig.1).

Trou des Nutons 8

This is an engraving of the head and part of the forequarters of a bison, on one surface of a corroded segment of reindeer antler (fig.6:19), which comes from the Magdalenian site of Trou des Nutons. It was found during Dupont's excavations, but lay unrecognised in the faunal collections of the Institute of Natural Sciences in Brussels for many decades.

Manufacture

(i) Débitage

There were no traces to suggest that any form of blank extraction had been carried out.

(ii) Modification

Both surfaces exhibit traces of modification in the form of longitudinal striations, which look like traces of scraping. On one surface, there is an engraving of the head and forequarters of a bison, on which one eye, the right horn and the mane are very clearly delineated. The engraving is composed of short, transverse and oblique incisions as well as long, curving incisions. On the other surface, various curving and straight incisions may be seen; they do not appear to be at all organised.

It is most interesting that on both Robin Hood's 2 and Trou des Nutons 8 the same parts of the animal were chosen for representation. These are the only two engravings of animals on osseous materials recognised in the British and Belgian Upper Palaeolithic, with the exception of a series of animal engravings on a piece of mammoth ivory found at the Trou Dubois (Moha), which lies outside the scope of this study (Destexhe-Jamotte 1957,84-92,Figs.17-25; Lejeune 1984, 224, 226, Fig.111).

A number of engravings of animals on stone plaques have been found in Magdalenian contexts in Belgium, but they do not include bison. They do include a very fine representation of a moving aurochs on a psammite plaque from Trou de Chaleux (Twiesselmann 1951, 20,Fig.5; Lejeune 1984,220,Fig.103). An engraving of the rearquarters of another bovid was preserved on two psammite plaques from Trou du Frontal (Twiesselmann 1951,5,Fig.1; Lejeune 1984, 219,Fig. 102). Outside this region, parallels for Trou des Nutons 8 were drawn by Lejeune (1984,221) with a fragment of a perforated bâton from Isturitz. Other examples of the many representations of bison from the South West of France include the

engraving of a bison on stone from Laugerie Basse, Dordogne figured by Obermaier (1924,218,Fig.98).

Working Débris

This section consists of a description of the various methods of manufacture which were identified from unfinished bone, antler and ivory artifacts in these collections. These pieces were examined by me with particular care and were given artifact numbers; many other examples which were recognised and were too numerous to be studied in detail are listed in the inventory.

The methods of débitage for which evidence was provided by these unfinished pieces were the groove and splinter technique, longitudinal sawing, transverse sawing and snapping, and chopping and sawing, in that order of frequency. It is probable that a commonly used method of débitage was percussion, but definite traces of this technique have not been recognised by me, as pieces produced this way cannot easily be distinguished from naturally broken splinters (see Chapter 2). The most commonly encountered methods of modification appeared to be scraping, and grinding; modification by flaking or splitting was only rarely identified.

It became clear that the same techniques of manufacture were used on all three raw materials considered here. Chronological variation in methods of débitage and modification was looked for, but as far as I could tell with the inadequate available dating evidence, the same methods appear to have been used throughout the Upper Palaeolithic in this region. These techniques of manufacture were generally found throughout Belgium, but not always in Britain, for very few examples of working débris were recovered from British sites. So few pieces may have been preserved, because the osseous industry as a whole was smaller in Britain, or because

it was usually only finished artifacts which were brought into the country. The identification of an actual ivory workshop at Paviland (see Chapter 7) would suggest, however, that this was at least not always the case.

The dimensions of the various pieces of working débris are not recorded in detail here, because they are generally fragmentary pieces, and it is unlikely that any useful information would be obtained in this way.

The artifacts considered here have been placed into the following categories, which will be discussed in turn below:

1/ Extracted Pieces with no Further Modification

2/ Extracted and Modified Bone

3/ Extracted and Modified Antler

4/ Extracted and Modified Ivory

5/ Modified Bone

6/ Modified Antler

7/ Modified Ivory

8/ Pieces with the Minimum of Modification

9/ Pieces with Traces of the Removal of a Blank by Longitudinal Sawing

10/ Sawn-off Articular Ends

11/ Sawn-off Segments of Antler Rods

1/ Extracted Pieces with no Further Modification

Twenty-four pieces of bone, antler and ivory were identified (see Table 6:12), which showed traces of deliberate extraction, but which appeared to have received either no further modification, or at least the very minimum (fig.6:20). These artifacts appear to have been abandoned at that stage, i.e. they are unused blanks.

Table 6:12
Number and Distribution of Extracted Pieces

Site Name	Bone	Antler	Ivory
Gough's	1	-	-
Chaleux	1	1	-
Magrite	2	2	-
Spy	-	-	4
Renard	4	-	-
Goyet	1?*	3	-
Maisières	-	1	2
Verlaine	-	1	-
Forêt	-	1	-
Totals	9	9	6

*Goyet 91 = corroded, cortical material, probably bone

Manufacture

(i) Débitage

These pieces showed considerable variation in the methods of blank extraction used; these are laid out in Table 6:13 below. It should be noted that 'blanks' may have deliberately been extracted by percussion on a regular basis, but as they cannot easily be distinguished from naturally broken splinters, they have to remain unrecorded.

Table 6:13
Methods of Débitage recognised on Extracted Pieces

Site Name	*G+S	LS	TSS	CS	Total
Gough's	-	-	1	-	1
Chaleux	1	1	-	-	2
Magrite	3	1	-	-	4
Spy	4	-	-	-	4
Renard	1	3	-	-	4
Goyet	2	-	1	1	4
Maisières	2	1	-	-	3
Verlaine	1	-	-	-	1
Forêt	-	-	1	-	1
Totals	14	6	3	1	24

* G+S = Groove and Splinter, LS = Longitudinal Sawing, TSS = Transverse Sawing and Snapping, CS = Chopping and Sawing

As Table 6:13 shows, most of the specimens in this group appear to have been produced by the groove and splinter technique. This was suggested by their regular shapes and the presence of longitudinal and

oblique striations and facets on their sides. Another six pieces of bone and antler appear to have been longitudinally split by sawing, which leaves similar traces to those produced by groove and splinter, but they are located on the inner edges of the bone or antler instead of on the sides. Magrite 23 is one half of a metapodial which has been very neatly split in two by longitudinal sawing (fig.6:20). Its inner edges are covered with longitudinal striations, facetting and chattermarks. The care with which it was worked is striking and suggests that it may have been intended to be further modified into a point, for example. Chaleux 92 has been produced in the same manner and it also bears a number of deep, transverse incisions in the sides of the shaft, which may have been intended to reduce further this bone into suitable sized blanks.

Three specimens showed traces of extraction by transverse sawing and snapping. They include Forêt 8 and Goyet 5 which are 'T' shaped pieces of antler composed of part of a beam and one tine; both have been transversely sawn and snapped off at the base, but they are in such a corroded condition that no traces of working have survived. The third example is Gough's 8, which is a piece of rib bone, which has been transversely sawn and snapped off at one end. Some transverse incisions are visible next to the sawn end on both surfaces.

Goyet 164 is a very corroded antler tine, which has probably been chopped and sawn off at one end.

Variation and Distribution

As Table 6:12 shows, the objects in this group were found throughout Belgium and on sites whose ages range from the very beginning to the very end of the period considered here. However, there is only the one example from a British collection and indeed little working débris of any form has been identified within the British assemblages considered here.

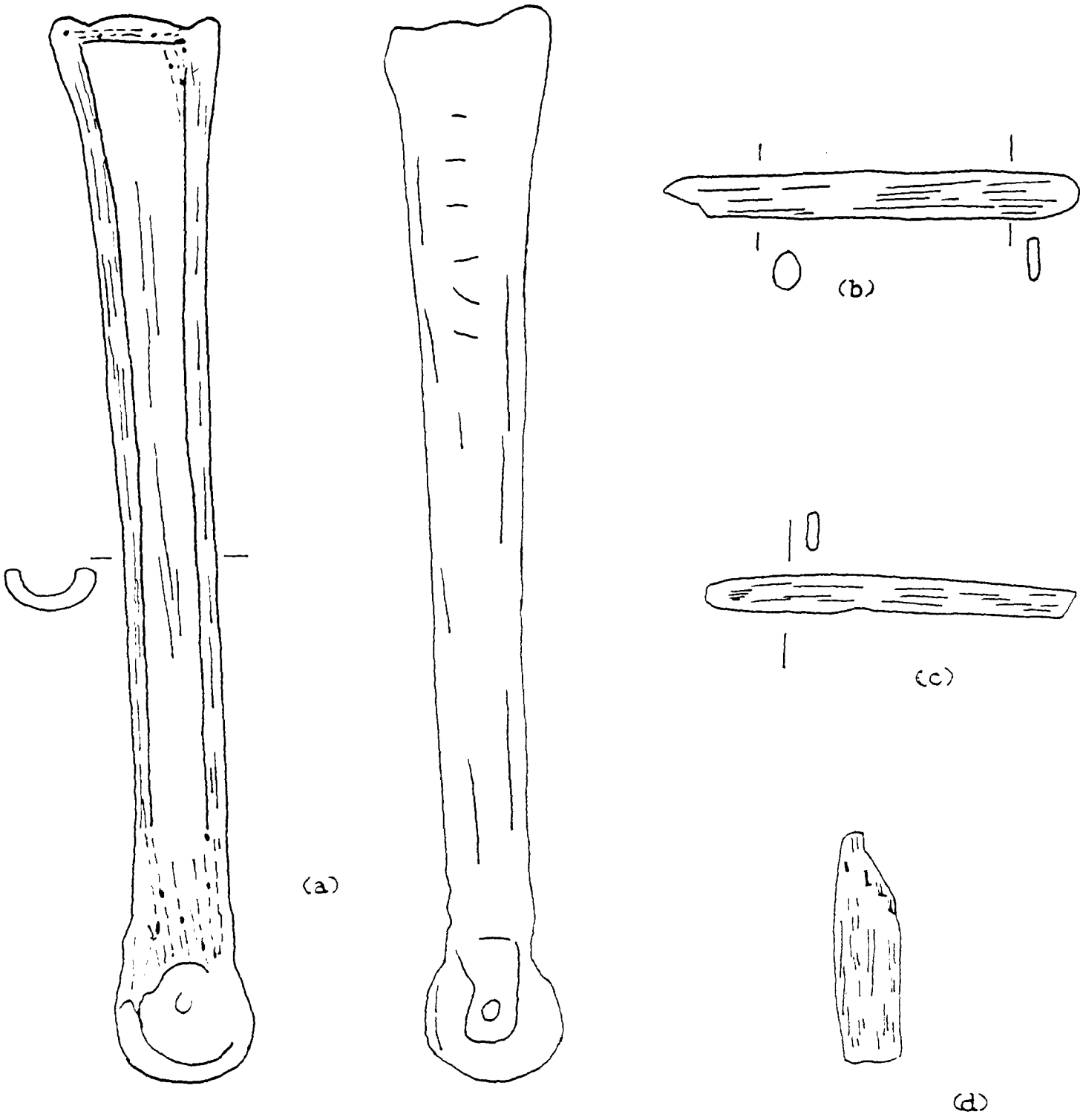


Fig. 6:20 Working Débris: (a) Trou Magrite 23 (b) Coléoptère 13 (c) Frontal 11 (d) Paviland 16

2/ Extracted and Modified Bone

Twenty-nine pieces of bone which have been deliberately produced and modified are discussed here (fig. 6:20) (see Table 6:14). The reason why they appear in this section is because they have not been fashioned into recognisable artifact types.

Table 6:14
Methods of Débitage recognised on Extracted and Modified Bone

Site Name	G+S	TSS	Total
Grotte de Spy	6	1	7
Trou de Renard	1	-	1
Verlaine	1	-	1
Trou du Frontal	1	-	1
Magrite	3	-	3
Chaleux	1	2	3
Coléoptère	1	-	1
Goyet	6	1	+1* 8
Maisières	1	1	2
Paviland	1	1	2
Total	22	6	1 29

* Goyet 11 see below

Manufacture

(i) Débitage

As may be seen in Table 6:14, twenty-two pieces appear to have been produced by the groove and splinter technique; this is because they have regular shapes with generally longitudinal striations on their sides, as well as facets and chattermarks.

Another six specimens had been extracted by transverse sawing and snapping at one end. A typical feature of this process is the presence of transverse incisions near to the sawn end.

One final specimen, Goyet 11, had been produced by the groove and splinter technique, judging from the regular striations on its sides, and at some stage, one end had been sawn transversely and snapped off.

(ii) Modification

Clear traces of scraping in the form of mainly longitudinal striations, facets and chattermarks, in certain cases, were visible on twenty-three specimens. Some striations were visible on the other five objects in this group. No traces were preserved on Goyet 86.

Coléoptère 13, Frontal 11 and Chaleux 56 are all roughly similar in appearance (fig.6:20); they are all flat, thin, bone blanks which have been produced in the same manner. Both Chaleux 56 and Coléoptère 13 have been made bevelled at one end. They are all curiously misshapen pieces, which have reached a quite advanced stage of modification but do not resemble any finished artifact. Silicone rubber casts were made of both Coléoptère 13 and Frontal 11 so that they could be examined microscopically. When Coléoptère 13 was inspected in a scanning electron microscope, the traces of scraping on its surfaces, which included grouped longitudinal and transverse striations as well as chattermarks, could be seen very clearly (Plate 6:7). When viewed under the light microscope, similar traces could be seen on Frontal 11. These three pieces were presumably roughouts, but for what sort of artifact it is hard to say, although the bevel on two of these pieces might suggest that they were intended to be made into tiny projectiles with a bevelled base like Maisières 32 (see Chapter 4: Spindle-shaped Points).

Variation and Distribution

The list of sites on which these pieces were found is given in Table 6:14; it shows that they had both a very extensive geographical and chronological distribution. This is hardly surprising as such pieces do not represent a specialised type.

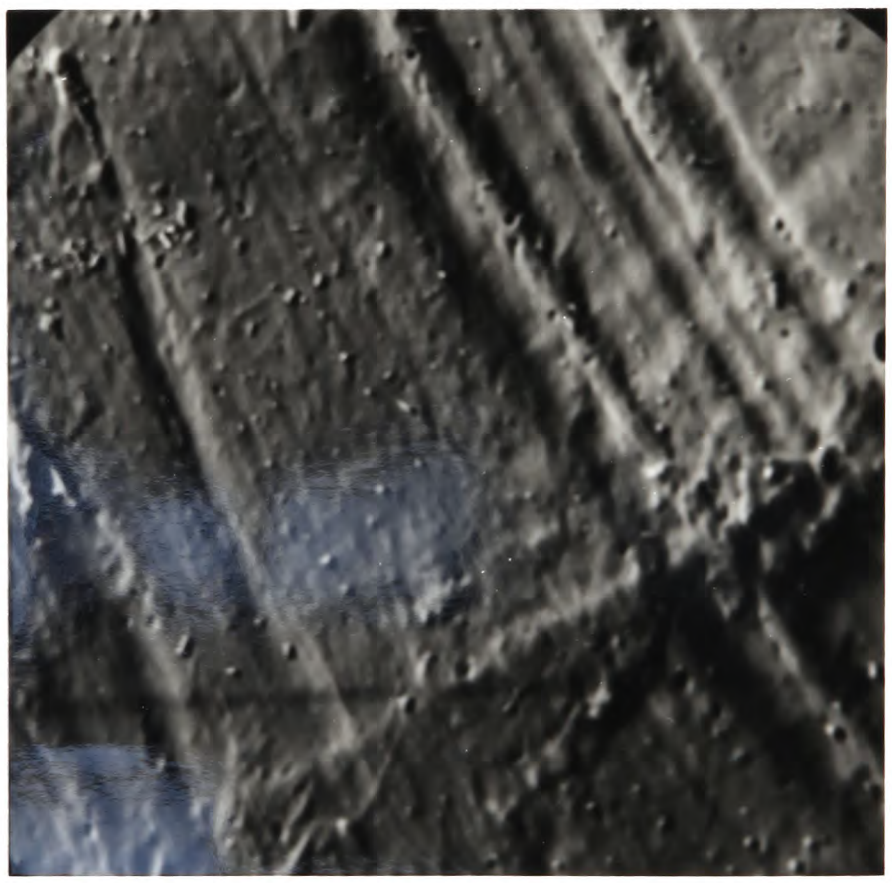


Plate 6:7 Traces of modification, including chattermarks, on Coléoptère 13 (x55) (SEM photograph)

3/ Extracted and Modified Antler

Fourteen pieces of antler are described here which appear to have been deliberately extracted and modified, but not to an extent where they form recognisable tool types (fig.6:21).

Table 6:15
Methods of Débitage recognised on Extracted and Modified Antler

	G+S	TSS	C	Totals
Trou Magrite	2	1	-	3
Verlaine	1	-	-	1
Chaleux	2	1	-	3
Goyet	6	-	1	7
Totals	11	2	1	14

Manufacture

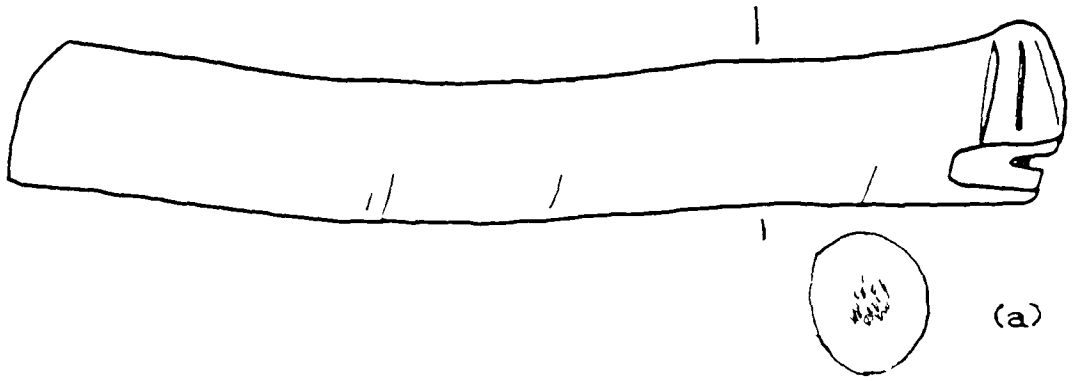
(i) Débitage

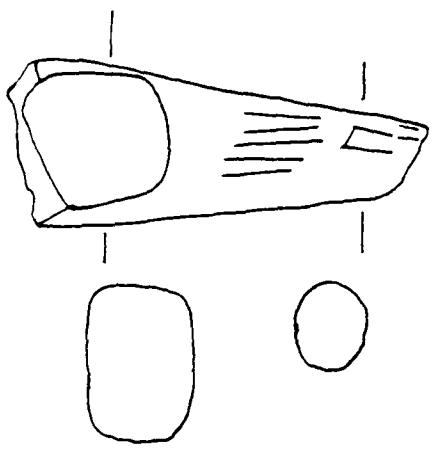
As may be seen from Table 6:15, eleven of the specimens considered here appear to have been produced by the groove and splinter technique. This is suggested by the regular shapes of these pieces and the presence of longitudinal striations, facets and sometimes chattermarks on their sides. Goyet 139 has also been finished off at one end by whittling and snapping off the excess material. Transverse steps may be seen on the whittled area where the stone tool has dug into the bone.

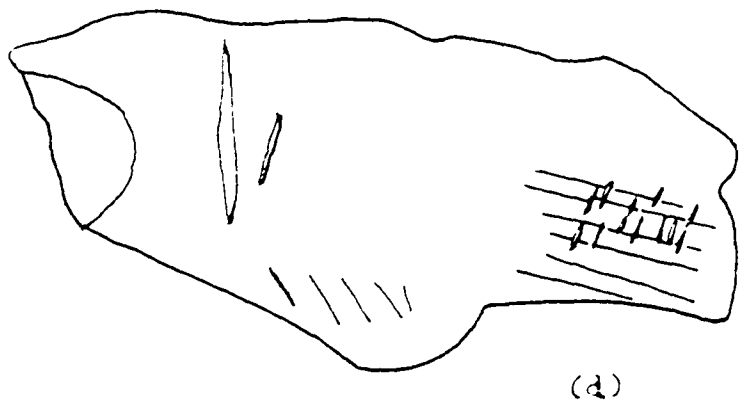
In contrast to the above, Chaleux 81 and Magrite 51 are antler tines which have been transversely sawn and snapped off at one end. In each case, some preparatory incisions may be seen near to that end. Goyet 58 has been chopped of at one end, leaving traces of impact on the base of the tine.

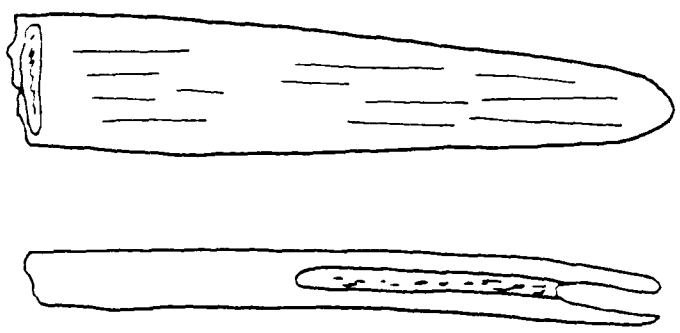
(ii) Modification

Seven pieces showed very clear traces of scraping, in the form of striations, facets and transverse nicks and steps, where the stone tool had cut into the bone. One of these pieces, Chaleux 66, was being made bevelled at one end. Another five specimens show various striations on









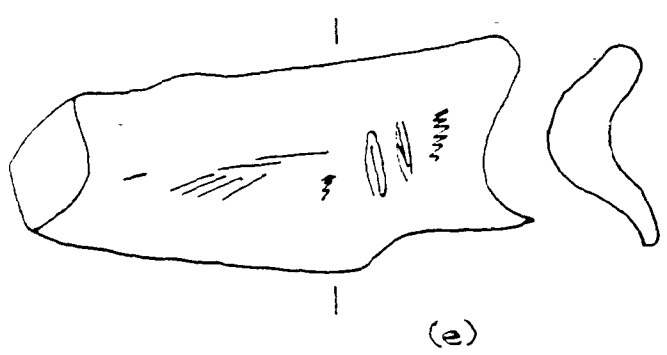


Fig. 6:21 Working Débris: (a) Trou Magrite 51 (b) Spy 108 (c) Spy 5 (d) Paviland 36 (e) Verlaine 34

their surfaces, which are most probably a result of scraping rather than grinding. No traces were preserved on the surfaces of Goyet 141, but their irregularity suggests that they may have been roughly scraped. Magrite 51 bears four short, shallow, oblique incisions on its shaft (fig.6:21).

Variation and Distribution

The geographical distribution of these pieces is limited to Belgian sites, but their chronological distribution is harder to judge, because Goyet and Trou Magrite are multiperiod sites, which were not very well recorded when excavated. The presence of examples from Verlaine and Chaleux proves that some pieces came from the Later Upper Palaeolithic, but this information is not particularly useful, for it is clear from the surviving artifacts that reindeer antler was worked by these methods during both the Earlier and the Later Upper Palaeolithic.

4/ Extracted and Modified Ivory

Eighty-one pieces of ivory have been recognised in these collections, which have been deliberately extracted and then modified (fig.6:20). However, they have not received sufficient modification to turn them into recognisable tool types.

Table 6:16
Number and Distribution of Pieces of Extracted and Modified Ivory

Paviland	1
Chaleux	1
Renard	1
Goyet	1
Magrite	1
Frontal	2
Maisières	13
Spy	61
Total	81

Manufacture

(i) Débitage

All of these pieces appeared to have been extracted by the groove and splinter technique; this was suggested by their regular shapes and by the presence of longitudinal striations and facets on their sides. Five examples showed further traces of débitage at their ends. These included Paviland 16, one end of which has either been cut transversely or else very neatly broken, while the other end has been whittled down by scraping, giving it a stepped appearance (fig.6:20). Spy 83 appeared to have been finished off at one end by chopping, whereas Spy 142 had been sawn and snapped off at one end. The same process seems to have been carried out towards the wider end of Maisières 58, but with less success as part of one surface has not been snapped off.

The roughly triangular shape of Spy 108 suggests that it may have been the core of a mammoth tusk, and the presence of striations and facets on its sides and surfaces may be interpreted as being where a number of blanks have been extracted from it (fig.6:21).

(ii) Modification

Sixty-four specimens showed traces of working such as longitudinal and oblique striations, facets and chattermarks, which were thought to be the result of scraping. Three of these pieces, Spy 106, 139 and 179, showed traces of bevelling at one end; this may have been either a form of reduction or modification.

A further fourteen specimens showed fewer traces of modification, but owing to the very small size of these pieces, it seems more probable that they were worked by scraping than by grinding. The upper surface of one of these pieces, Spy 181, appeared to be polished, which may have been a result of modification, which by chance has been preserved. A further three specimens had no surviving traces of working on their surfaces.

Variation and Distribution

As may be seen from Table 6:16, the vast majority of these pieces inevitably come from the largest ivory-working industry in the region of this study and that has been attributed to an Aurignacian level or series of levels at the Grotte de Spy. The possible significance of the abundance of ivory-working at Spy is discussed in the following chapter.

5/ Modified Bone

Thirty-eight pieces of modified bone were recognised among the collections studied here (see Table 6:17), which show no traces of deliberate extraction, but have been modified (fig.6:21). However, these objects appear to have been rejected before they were turned into recognisable tool types; this may be because they proved to be an unsuitable shape or size.

Table 6:17
Number and Distribution of Pieces of Modified Bone

Paviland	1
MGP*	2
Gough's	2
Chaleux	2
Forêt	1
Coléoptère	1
Verlaine	6
Frontal	1
Maisières	4
Spy	12
Goyet	4
Magrite	1
Nutons	1
Total	38

*MGP = Mother Grundy's Parlour

Manufacture

(i) Débitage

No possible traces of blank extraction were identified, apart from some facetting on Goyet 84, but as this piece has such an irregular shape, it is most probable that these traces were associated with modification.

(ii) Modification

As Table 6:18 shows, various methods of modification appear to have been carried out on these pieces.

Table 6:18
Methods of Modification recognised on Pieces of Modified Bone

Site Name	Scraping	Flaking	Cleft	Impacted	Minimum	Total
Paviland	-	-	-	1	-	1
MGP	1	-	-	-	1	2
Gough's	2	-	-	-	-	2
Chaleux	2	-	-	-	-	2
Forêt	-	-	-	-	1	1
Coléoptère	-	-	-	-	1	1
Verlaine	4	-	-	1	1	6
Frontal	-	-	-	-	1	1
Maisières	1	-	-	-	3	4
Spy	4	-	1	-	6	11
Goyet	1	1	-	-	2	4
Magrite	1	-	-	-	-	1
Nutons	1	-	-	-	-	1
Totals	17	1	1	2	16	37 +1*

*Spy 143 on which no clear traces were recognised, but as it has clearly been made bevelled, there is no doubt that it has been modified.

Seventeen pieces in this category were clearly worked by scraping, resulting in characteristic traces such as irregular, longitudinal striations and chattermarks.

Spy 5 is a segment of rib bone, which has been split at one end by scraping out some cancellous tissue. Unfortunately, the surfaces of this piece are so corroded that no traces of working are preserved (fig.6:21).

As Table 6:18 shows, sixteen specimens exhibit only the minimum of traces of modification in the form of striations or incisions, which appear to have been made with a stone tool.

Paviland 36 and Verlaine 34 each bear what may be an impacted area on one surface (fig.6:21). On Verlaine 34, this takes the form of a damaged area and two deep, oblique grooves, within which some striations are visible, while on Paviland 36, there is an area of grouped, oblique striations with lots of rough cuts into the bone as if from having received a series of blows. Further along the bone, there is one deep, transverse cut and a shorter, slightly oblique cut within which some striations may be seen.

Goyet 104 is a bone splinter with, along one edge, the traces of where six little, semicircular flakes have been struck off (fig.6:22). These look more like traces of deliberate flaking than any other traces of working seen in these collections.

Function

(i) Traces of Use

It is probable that the traces visible on the outer surfaces of Verlaine 34 and Paviland 36 were associated with use. Both Spy 114 and 170 are polished on the narrower part of each piece; this could as easily be a feature of manufacture as of use.

(ii) Use

It is possible that some of these pieces may have been used without any further modification, though their shapes are not suggestive of any particular function. The traces on Verlaine 34 and Paviland 36 suggest that they may have come from bones used as anvils during tool-making. Thus, the incisions may have resulted from the stone tool slipping and cutting into the bone and the impacted area may have come about through percussion of either a direct or an indirect nature.

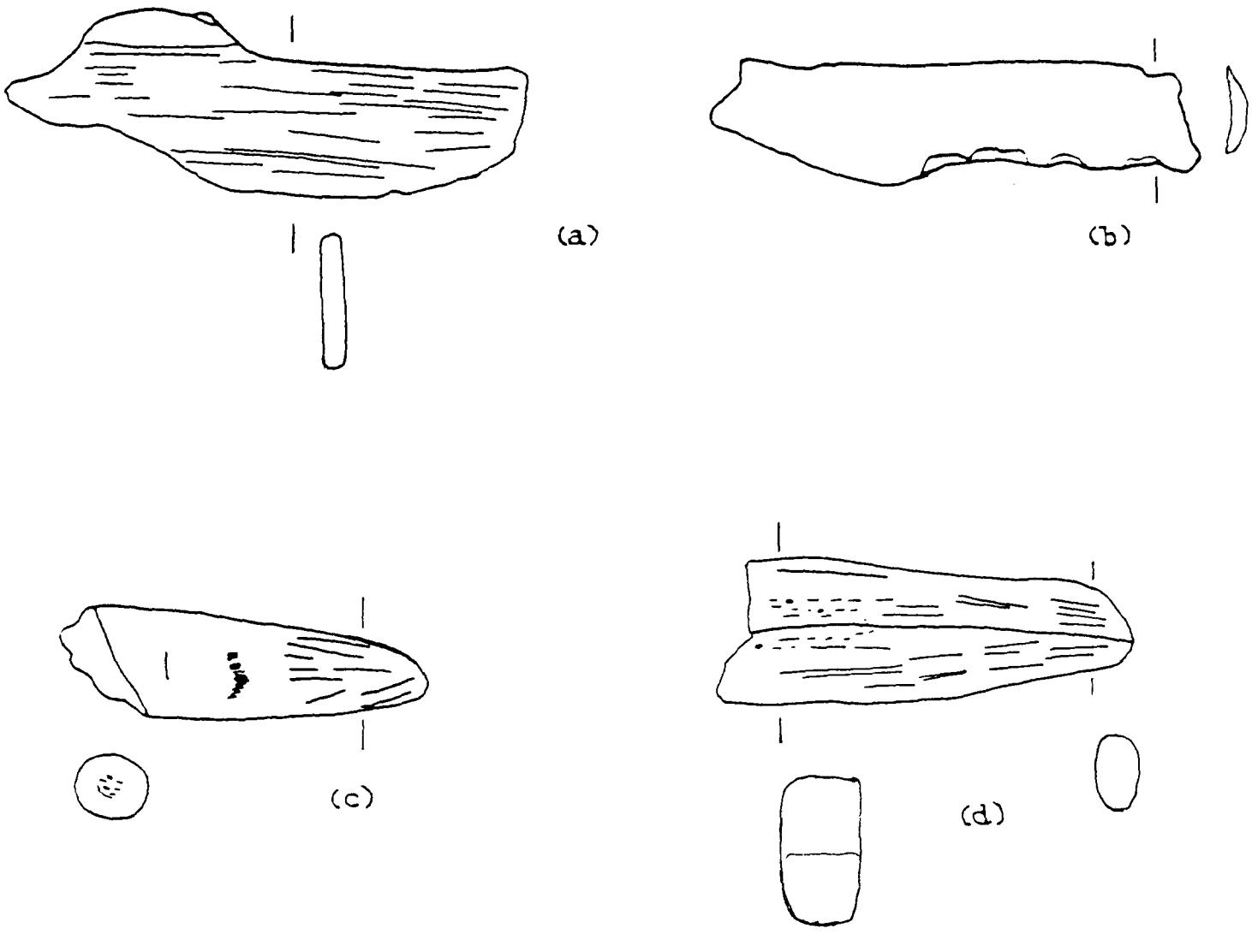


Fig. 6:22 Working Débris: (a) Goyet 83 (b) Goyet 104 (c) Trou Magrite 52 (d) Remouchamps 3 (e) Fond-de-Forêt 9

Variation and Distribution

As may be seen from Table 6:17, these pieces come from a large number of sites whose geographical and chronological distribution is widespread. This was to be expected as these pieces are very simple and non-specialised. The relative number of British to Belgian examples, that is 5:33, is also not surprising, owing to the paucity of working débris recognised in the British collections studied here.

6/ Modified Antler

Four pieces of antler have been identified (see Table 6:19), which appear to be splinters with no recognisable traces of blank extraction, but which have received some modification (fig.6:22). However, they have not been turned into recognisable tool types.

Table 6:19
Number and Distribution of Pieces of Modified Antler

Spy	1
Remouchamps	1
Magrite	1
Maisières	1

Manufacture

(ii) Modification

It is possible that Maisières 35 may have been split by longitudinal sawing, as some longitudinal striations and facets are visible on the edges. However, as it seems that this piece was worked all over, these traces may have been associated with modification rather than débitage. The other three examples show no traces of blank extraction.

Clear traces of scraping are preserved on Remouchamps 3 and Magrite 52 (fig. 6:22); the latter and Maisières 35 are the only worked antler tips to be identified in the collections studied here. These traces consist of irregular longitudinal and oblique striations, facets and chattermarks.

The great variations in the depth of the striations on Remouchamps 3 is a further indication that they have been worked by scraping rather than by grinding. The surfaces of Maisières 35 are corroded, but they are also irregular, as if roughly worked by scraping. Spy 3 is a cylindrical piece of antler with a very regular outline, so it must have been very carefully modified, but no traces are preserved on its surfaces.

Variation and Distribution

These four specimens come from Belgian sites with a wide geographical and chronological distribution. No examples of this type were recognised in Britain, but such pieces could have been very easily overlooked by nineteenth century excavators.

7/ Modified Ivory

Seventeen pieces of ivory have been identified, which appear, in general, to be splinters with no recognisable traces of blank extraction, but which have been modified (fig.6:22). However, they have not been turned into recognisable tool types and may have been abandoned at this stage.

Table 6:20
Methods of Modification recognised on Pieces of Modified Ivory

Site Name	Scraping	Minimum	Totals
Spy	2	3	5
Trou Magrite	-	1	1
Maisières	2	-	2
Forêt	1	-	1
Goyet	2	2	4
Paviland	4	-	4
Totals	11	6	17

One of the specimens from Paviland, number 23, was tinted pink with red ochre, which is a feature of that deposit. Maisières 38 showed brown and reddish patches, which suggested that it may have been burned.

Manufacture

(i) Modification

It is possible that Paviland 34 may have been deliberately extracted, but any traces of that process have been obliterated by later modification. Owing to its roughly triangular shape, Paviland 35 looks like the core of a mammoth tusk, from which blanks may have been removed, but no traces of this survive.

The nature of the traces observed on these pieces is laid out in Table 6:20. Eleven specimens appear to have been worked by scraping, owing to the often irregular nature of the longitudinal and transverse striations on their surfaces. One particularly heavily worked piece is Goyet 83, which has been scored and grooved on one surface. The shape of this piece resembles that of a duck, but is so crude that the resemblance may be fortuitous (fig. 6:22). The objects listed in the second column of Table 6:20 showed only a few traces of modification on their surfaces in the form of little longitudinal and oblique striations.

Variation and Distribution

The distribution of these pieces is widely scattered geographically, but it may be restricted chronologically to the Earlier Upper Palaeolithic. Without direct dating this is difficult to confirm, for Maisières Canal, an Upper Perigordian occupation, is the only single period site to be represented here. An attempt is going to be made to obtain a radiocarbon accelerator date from the Paviland ivory, which might give some indication of whether it does belong to the Earlier Upper Palaeolithic. This apparent distribution is underlined by the absence of any solely Later Upper Palaeolithic sites such as Chaleux or Coléoptère from this list. This may be explained by the probable disappearance of the mammoth from the region of this study just before the Last Glacial Maximum (Campbell 1977:I:148; Stuart 1982,164), although a recently obtained

radiocarbon date on mammoth in Shropshire (Hedges et al. 1988) suggests that it may have survived into the Late Glacial in some places at least.

8/ Pieces with the Minimum of Modification

This group consists of seventeen pieces of rib or limb bone, which show no recognisable traces of extraction but bear minimal traces of modification (see Table 6:21). These usually consist of a small number of incisions or striations on the surface. One example, Forêt 9 (fig.6:22), seems to have traces of impacts on its upper surface, which might have come about through it being used as an anvil during tool manufacture, in the manner described for Verlaine 34 and Paviland 36.

Table 6:21
Number and Distribution of Pieces with Minimal Modification

Forêt	3
Spy	3
Chaleux	2
Maisières	9
Total	17

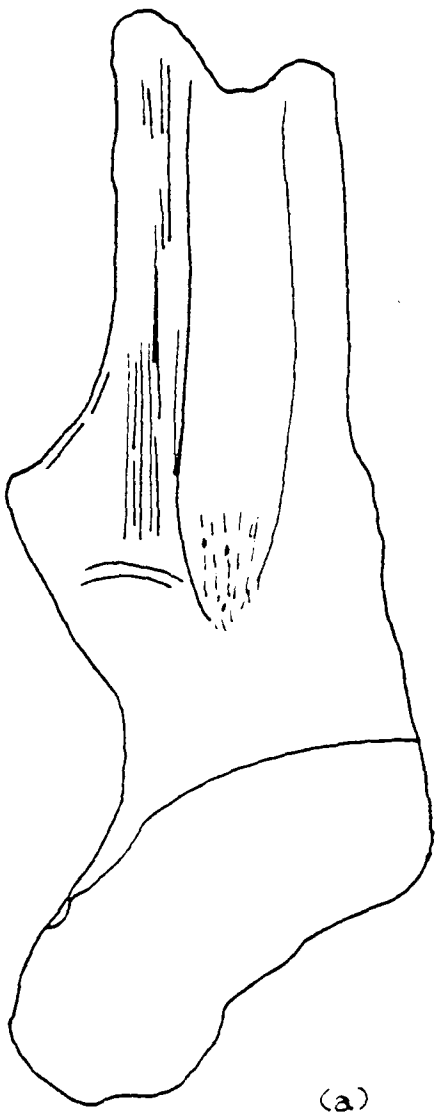
All of these pieces are in a very poor condition; some of the examples from Maisières show traces of what appears to be root etching. Maisières 18 and 19 are also both quite blackened and reddened, which suggests that they may have been burnt.

Variation and Distribution

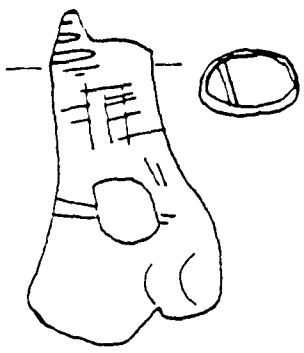
This is not particularly meaningful, because such pieces would be very easily overlooked by excavators, museum curators and researchers.

9/ Pieces with Traces of the Removal of a Blank by Longitudinal Sawing

Five examples of this type have been identified, two are made of bone, Frontal 18 and Coléoptère 19, two are made of antler, Chaleux 118 (fig. 6:23) and Spy 173 and the other is made of ivory, Spy 175. Each piece has



(a)



(b)



(c)

Fig. 6:23 Working Débris: (a) Chaleux 118 (b) Chaleux 87
(c) Pin Hole Cave 18

had a 'blank' removed by longitudinal sawing, or in the case of Spy 175 this process was being carried out when this piece was abandoned. On the two better preserved examples, Coléoptère 19 and Chaleux 118, traces of this process could be seen on the edges in the form of regular, longitudinal striations. Spy 173 is a tine fragment which had itself been sawn off before a blank was removed from one side, leaving some longitudinal facetting. This piece may have been extracted prior to the removal of the blank in order to make it easier to work.

Variation and Distribution

The distribution of this particular type of working débris is restricted to Belgium. Within this area, these pieces show a widely dispersed chronological and geographical distribution.

10/ Sawn off Articular Ends

Three examples of this type were recognised; they were Frontal 20, Chaleux 87 and Pin Hole 18. They all have been removed by sawing and snapping transversely, so as to leave the bone shaft free to be modified into whatever tool was required (fig. 6:23). The other articular end could have either been kept or removed.

Manufacture

(i) Débitage

The technique used on all of these pieces is most clearly illustrated on Pin Hole 18. The bone has been transversely sawn all round to produce a circular groove in the cortical tissue, then the bone was snapped across the middle, softer tissue. The traces of this on the end of the piece consist of a smooth, outer circle covered with clear, longitudinal striations and an inner, jagged area.

(ii) Modification

A number of striations may be seen on each piece, which may have resulted from the original cleaning of these bones. Some deep incisions are also visible on each example; these probably represent trial cuts or marking out, though one example on Chaleux 87 is particularly wide and deep and its location so close to the articular end might suggest a different function. Unfortunately, it is now perforated with what is probably a natural hole.

Variation and Distribution

Working débris of this nature was recovered from both Britain and Belgian occupation sites: the Belgian examples are of Magdalenian age, whereas the age of the specimen from the multiperiod site of Pin Hole cannot unfortunately be determined as the precise context of this piece is unknown.

11/ Sawn off Segments of Antler Rods

These are the proximal parts of antler rods including the double bevelled area, which have been deliberately removed from the rest of the piece after it appears to have been fully modified. Three examples have been recognised within the collections studied here; they are Goyet 19 and 46, and Chaleux 84. They are described in detail in the section on antler rods (Chapter 4: Antler Rods).

This concludes the third and last of the chapters in which the artifacts and the working débris associated with their manufacture are described. The following chapter constitutes a review of the chronological and the geographical distribution of the artifacts and their implications, as well as a discussion of the probable Upper Palaeolithic activities represented by the osseous industries considered here.

Chapter 7

Chronological and Geographical Variation in Artifact Types

Introduction

The aims of this thesis, as set out in Chapter 1, not only concerned deriving as much technological information as possible from the osseous industries of the Upper Palaeolithic in Britain and Belgium, but also I intended to look for chronological and regional patterning in tool types, raw materials and methods of manufacture within and between both assemblages. Such variation could provide evidence for relationships between the various human groups who lived in this area during the Upper Palaeolithic. Another aim of this study involved seeking evidence for the various activities carried out during this period, which may not be so clearly witnessed by the stone tools. In this, the last chapter, a review of the chronological and geographical distribution of the artifacts studied here is set out and its implications discussed. It is followed by a summary of the probable Upper Palaeolithic activities represented by these artifacts. However, to begin with, it is worth briefly looking at how these conclusions were reached.

As we have seen (Chapter 1), the methods used in the analysis of the artifacts and of the traces of manufacture and, infrequently, use observed on them included making a microscopic study of selected pieces either under a light microscope, or in a scanning electron microscope. The latter process necessitated making silicone rubber casts of the areas of interest, so that they could be sputter-coated with gold, and fitted into a small viewing chamber. Ethnographic sources also provided much useful information about how osseous artifacts might be manufactured and used. No statistical analysis was carried out, as it would have been inappropriate

owing to the inadequacy of the material as a reliable statistical sample. Another particularly important method of analysis was the experimental replication and documenting of traces of manufacture commonly found on Upper Palaeolithic osseous artifacts (see Chapter 2). This proved invaluable when attempting to recognise and interpret traces of manufacture on archaeological specimens. A limited number of experiments were carried out in an attempt to reproduce traces of use on selected artifacts. These proved to be valuable, but, as was discussed in detail in Chapter 2, such studies are less likely to reveal useful information than those concerned with manufacture, because traces of use are not preserved on the same regular basis as traces of manufacture. Various effects caused by natural modification of osseous materials were also considered.

The third chapter dealt with the nature of the archaeological evidence, including one important point which is worth considering again at this stage. It concerned the paucity of osseous artifacts and of working débris recovered from British Upper Palaeolithic sites compared with the abundance found in Belgium. Certain variables are known to have affected the preservation of these assemblages such as the fact that most of the Belgian material is held in two major museums, whereas in Britain it is scattered throughout the country to regional museums and sometimes private collections. However, it was concluded that these did not provide the real reason for this phenomenon, but that the variation in the distribution of finds of osseous artifacts was probably a true reflection of the Upper Palaeolithic distribution. Thus, in the present state of knowledge, it seems likely that only small-scale, temporary occupations of Britain took place from more regular bases on the Continent.

In Chapters 4, 5 and 6, each tool type was described in detail, including a discussion of the raw materials used, the traces of manufacture and their interpretation, and the traces of use, and their

interpretation. Their chronological and geographical distributions were recorded and this, the final chapter, contains an analysis of those chronological and regional distributions, and an interpretation of the variations that have emerged. My original aims for such an analysis when I began the research for this thesis which are outlined above had to be substantially modified as it became clear to me that the necessary contextual and chronological information for these artifacts in most cases just did not exist. However, these aims should not be forgotten, because it seems to me to be important continually to bear in mind what could be achieved with more scrupulously excavated, recorded and dated material. It should also be underlined here that this difficulty in no way invalidates the results of the detailed technological study of this material made by me and described in Chapters 4, 5 and 6. However, when the approaches to solve this problem which are suggested below have been put into common practice, the new chronological evidence that will result will add a further dimension to the information given in the aforementioned chapters. After these somewhat gloomy remarks, we shall see that in spite of the problems some interesting conclusions about the chronological and geographical variation of these artifacts were reached.

When I began the research for this thesis, one of my aims was to reconstruct the bone tool inventory for each major stage of the Upper Palaeolithic, in order to see whether any important changes through time could be observed. Such changes could be explained by new activities being carried out, or by differing areas of contact and influence. Another related aim was to compare the tool kits of Britain and Belgium at each stage, in an attempt to determine the nature and extent of contact between the two areas, and to see if this might have varied through time. I also wanted to look for chronological and regional variation within particular tool categories, which could perhaps be explained by the

development or refinement of an artifact type through time, or by varying local styles in the expression of a well-known idea. I hoped that such a study might also shed light on the nature and duration of settlement in Britain in particular.

The major problem that I encountered when I attempted to undertake such an analysis concerned the general absence of reliable stratigraphic and chronological information. For this reason, it is often impossible to attribute particular artifacts to particular stages of the Upper Palaeolithic on any secure basis. To make such attributions on typological grounds alone would be a risky undertaking, as may be illustrated by the opinion, expressed by Breuil, that in the Magdalenian uniserial barbed points preceded the typologically more advanced biserial barbed points in time, when this is clearly not exclusively the case (Julien 1982,14). Because it is frequently impossible even to tell to what particular stage of the Upper Palaeolithic these pieces belong, it would for example be wrong to attempt a detailed chronological analysis of this material by comparing the assemblages which are merely estimated to belong to various named 'periods', such as 'the Magdalenian' and 'the Aurignacian'. As a result of careful consideration, I have been able to grade each of the tool types studied here into one of three categories depending upon the nature of the associated chronological evidence and the amount of information about chronological and spatial relationships they are likely to yield. The first category consists of artifacts which can yield little information of this nature, because they are types which are found wherever osseous materials are worked. The second category consists of pieces with a clearly more restricted chronological distribution, though its nature is doubtful, owing to the absence of reliable contextual information. The third and smallest category consists of those few tool

types which provide the best evidence for chronological and geographical variation.

Before that, some ways in which this problem of chronology could be solved will be discussed. The essential work which should be carried out in order to provide the desperately needed chronological evidence for the Upper Palaeolithic osseous industries (and indeed such research would no doubt be equally beneficial to lithic studies) may be placed under three headings.

(i) The first approach would involve carrying out a major programme of radiocarbon accelerator dating of a large number of bone, antler and ivory artifacts, where possible from documented, stratified deposits in order to provide most information. It should be stressed that it is actual artifacts which must be dated, and not unmodified pieces of animal bone from the same layer. This has been done successfully without destroying the specimen, for example on the decorated horse mandible from Kendrick's Cave (Gillespie et al. 1985,238).

(ii) The second approach would involve the re-excavation of already known Upper Palaeolithic sites where undisturbed deposits survive, in order that modern stratigraphic observations may be made. Such work has already been successfully carried out in the area of this study; a few examples include, in Belgium, the excavations by Dewez at Remouchamps and Coléoptère, and those of Téheux at Chaleux, and in Britain, those of Campbell at Creswell Crags, McBurney at Cat Hole, and Green at Little Hoyle. Further examples of such useful research may be found in the inventory which forms part of this thesis.

(iii) The third approach is clearly the one that would involve the greatest expense of time and money with a risk of finding no new information: new sites should be looked for, not only in caves, but also in the open. It should be considered how the discoveries of the open-air

sites of High Furlong and Maisières Canal in the last couple of decades have dramatically changed our picture of the Upper Palaeolithic in these regions, not least by turning the minds of archaeologists to the possibility of the continued survival of open sites with preservation of bone from this period. Of course both sites had other unique features for example, the unusual nature of the lithic assemblage from Maisières Canal has led to the identification of a local version of the Upper Perigordian (Campbell 1986,20).

A further problem associated with making comparisons between the bone tool assemblages of different areas and periods is that one cannot be certain that a representative sample of the artifacts has been retrieved or preserved. Of the approaches suggested above, numbers (ii) and (iii) might both help to remedy this situation.

In spite of the problems detailed above, I have made an attempt to salvage some information about the chronological and geographical distribution of these artifacts where hard evidence exists. The site by site distribution of the artifacts studied here is given in Tables 7:1 and 7:2, which may be consulted in conjunction with the distribution maps in Chapter 3 (pages 52 and 53). The artifacts have been placed in three categories, as described above, depending upon the nature of the chronological evidence available for them. In each case, where such evidence is presented it is in the form of a summary of that given in the 'variation and distribution' section for each artifact.

The Chronological and Geographical Distribution of the Artifacts

Category 1: This category consists of types of artifact, which appear wherever bone is regularly modified. Within the region of this study, such tool types seem to be both geographically widespread, and the little

Table 7:1
Geographical Distribution of Osseous Artifacts in Britain

Tool Type / Site No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Group 1 Points				Y*					Y	Y						Y	Y
Group 2 Points								Y	Y				Y				
Group 3 Points													Y			Y	
Group 4 Points	Y		Y					+									Y
Group 4 (i)																	
Group 4 (ii)																	
Group 4 (iii)																	
Group 4 (iv)																	
Antler Rods								Y			Y	Y					
Ivory Rods	Y								Y							Y	
Barbed Points							Y							Y		Y	
Needles	Y	Y						Y								Y	
Pins																Y	
Bone segments with polish																	
Wedge-shaped Segments	Y																
Perforated Bâtons													Y				
"Whistles"																	
Spatulae	Y																
Beads	Y																
Pendants	Y					Y			Y								
Perforated Ivory Discs																	
Ivory Rings	Y																
Perforated Teeth	Y				Y											Y	
Perforated Shells																	
Incised Pieces	Y								Y	Y		Y				Y	
Representational Art										Y	Y						

* 'Y' is 'yes'
\+ is Creswell 1

Sites: 1 = Paviland Cave
2 = Cat Hole
3 = Little Hoyle
4 = Ogof Garreg Hir
5 = Kendrick's Cave
6 = Ffynnon Beuno
7 = High Furlong
8 = Church Hole
9 = Pin Hole Cave
10 = Robin Hood's Cave
11 = Mother Grundy's Parlour
12 = Fox Hole
13 = Gough's Cave
14 = Aveline's Hole
15 = Hyaena Den
16 = Kent's Cavern
17 = Torbryan Caves

Table 7:2
Geographical Distribution of Osseous Artifacts in Belgium

Tool Type / Site No.	1	2	3	4	5	6	7	8	9	10	11	12	13
Group 1 Points		Y*			Y	Y	Y	Y		Y			
Group 2 Points													
Group 3 Points	Y		Y	Y	Y	Y		Y	Y	Y		Y	Y
Group 4 Points	Y			Y	Y	Y	Y	Y				Y	
Group 4 (i)					Y	Y		Y					
Group 4 (ii)					Y			Y					Y
Group 4 (iii)					Y	Y		Y					Y
Group 4 (iv)								Y					
Antler Rods	Y	Y		Y	Y	Y		Y	Y			Y	
Ivory Rods				Y	Y	Y		Y				Y	Y
Barbed Points								Y	Y	Y			
Needles	Y			Y	Y	Y		Y	Y	Y			
Pins									Y				Y
Bone segments with polish								Y					
Wedge-shaped Segments				Y				Y		Y			
Perforated Bâtons								Y					
"Whistles"				Y				Y	Y				Y
Spatulae													
Beads					Y	Y			Y				
Pendants							Y		Y	Y		Y	
Perforated Ivory Discs				Y									
Ivory Rings					Y		Y						
Perforated Teeth						Y		Y		Y			
Perforated Shells									Y	Y			
Incised Pieces	Y		Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Representational Art		Y			Y								

* 'Y' is 'yes'

Sites: 1 = Trou du Frontal
2 = Trou des Nutons
3 = Trou du Renard
4 = Trou de Chaleux
5 = Trou Magrite
6 = Grotte de Spy
7 = Grotte de la Princesse, Marche-les-Dames
8 = Grotte de Goyet
9 = Verlaine
10 = Grotte de Coléoptère
11 = Grotte de Remouchamps
12 = Grotte de Fond-de-Forêt
13 = Maisières Canal

chronological information available to me suggested that they varied widely in age as well. For these reasons, the artifacts listed here should not be used as indicators of chronological or regional relationships. These tool types are:

Group 1 Points

Group 3 Points

Group 4 Points

Pins

"Whistles"

Perforated Teeth

Perforated Shells

Pieces with incised decoration excluding the lozenge pattern

Pendants

Representational Art

The attribution of perforated shells to this category is perhaps not wholly appropriate, because unlike all the other pieces discussed here, the production of perforated shells generally involves the long distance procurement of the shells themselves. Thus, the clear probability of contact between groups in different areas arises, and furthermore, variation in the source of the shells between certain industries has been observed in Belgium (Dewez 1986) (see Chapter 6: Perforated Shells).

Category 2: This category consists of tool types which clearly have a more restricted distribution, though the nature of their distribution is doubtful, owing to the lack of reliable chronological information. Thus, unlike Category 1, they may have some value for reconstructing Upper Palaeolithic relationships when the necessary dating evidence becomes available. These tool types are:

Split-based Points

Spindle-shaped Points

Whittled-based Points

Lozenge-shaped Points

Antler Rods

Ivory Rods

Beads

Ivory Rings

Spatulae

Wedge-shaped Segments

Bone segments with polish

Perforated Bâtons

Pieces with incised decoration - lozenge pattern

The split-based, spindle-shaped, whittled-based, and lozenge-shaped points are all found in small numbers in Belgium, and the little contextual evidence available allied with comparisons with the much better dated assemblages in South West France suggests that they may be attributed to the Earlier Upper Palaeolithic in general (see Chapter 4: Group 4 Points (i,ii,iii and iv)). These pieces have not been found in Britain, and as we have seen, their numbers in Belgium are very limited. This is particularly interesting, because they have been interpreted here as projectile points, with the possible exception of the spindle-shaped points, and in that case, we might expect them to be a frequently occurring type. This appears to be not so, bearing in mind the probability that examples of these types, particularly those which have been broken may not have been recognised. It is therefore likely that stone-tipped 'spears' were also used for hunting in both Britain and Belgium during this period, but that sadly the (wooden?) shafts have not survived, and the stone projectile tips have not been recognised as such. The nature of

other, perishable, devices which may have been used for hunting and fishing, and which are documented in the ethnographic record are discussed below.

Antler rods have been placed in this category, because they seem to have had a chronologically restricted distribution, although this has yet to be proved by direct dating of selected examples. A large proportion of the rods considered here, that is almost two thirds, come from sites which have yielded only Later Upper Palaeolithic material; the other third come from multiperiod sites, where there is insufficient stratigraphic evidence to confirm this date. Similar pieces do appear to date from the Upper Magdalenian in the Dordogne (de Sonneville-Bordes 1960,335). There is also one possible earlier French parallel for one of the Belgian rods (Goyet 105) (see Chapter 4: Antler Rods), since this specimen is very similar in appearance to the 'sagaies d'Isturitz' identified by de Sonneville-Bordes (1971), among others, as being a type fossil of the Upper Perigordian with Noailles burins. Unfortunately, there is again insufficient contextual information recorded for this piece for one to be certain that it actually belonged to the same period in Belgium, which is very poorly represented. The present situation is clearly most unsatisfactory, and the only safe conclusion in advance of a programme of radiocarbon accelerator dating is that antler rods existed in both Britain and Belgium during the Later Upper Palaeolithic: they may also have existed at least in Belgium before then, but this is not proven.

In Britain, the similarity between the antler rods from Fox Hole and Church Hole is very striking, and strongly suggests that there was some contact between the two sites. The rod from a third British site, Mother Grundy's Parlour, may also have been similar, but unfortunately only a shaft fragment survives. It is also perhaps worth noting that all the recognised British examples studied here are cylindrical, and thus belong

to Type (b), which is also represented in the Belgian collections but in much smaller numbers than for Type (a). The significance of this is uncertain, and may just be a matter of local preference.

It is interesting to note, given that antler rods are interpreted here (see Chapter 4: Antler Rods) as hunting devices, that at Coléoptère six barbed points were found but no antler rods, which may signify that each tool type represents a different method of hunting, or conceivably different prey. However, both barbed points and antler rods have been recovered at Verlaine and Goyet, but as it is not known if the two tool types were contemporary, it is impossible to tell whether they represent complementary methods of hunting or not. I was able to suggest as a result of my experimental work, that the choice between the production of an antler rod or a barbed point may reflect the degree of skill of the tool maker, for it would require a lot less skill to produce an antler rod, and then make grooves in it to contain armatures, than it would to produce a barbed point.

In the present lamentable state of the chronological evidence, it would appear that certain projectile points such as whittled-based points existed in the Earlier Upper Palaeolithic in Belgium, which have not been found in Britain. In the Later Upper Palaeolithic, antler rods and barbed points (see below) existed in both Britain and Belgium. Is this just an effect of the all too imperfect archaeological record, or were other locally preferred designs of projectile point used in Britain during the period prior to the Last Glacial Maximum? Or were closer links established between the two areas in the Later Upper Palaeolithic?

The ivory rods are a particularly interesting tool type owing to the tantalising hints that they give about relationships between sites during the Upper Palaeolithic. Most examples of this artifact type come from the caves of Spy and Paviland, which, owing to the relatively large volume of

worked ivory in their deposits and the apparent presence of stockpiled tusks (see Buckland 1823; Rucquoy 1886-1887), appear to have been workshops. I also think that owing to the concentrations of worked ivory on these sites and the relatively small amount on other sites where examples of this type are found, that Spy and Paviland are likely to have supplied either finished artifacts or roughouts to other sites.

Beyond the simple identification of these two workshops, it seems worth observing that there might have been an important difference between the two. At Spy there is a vast amount of ivory at all stages of working, and it is suggested here that this site functioned over a long period of time as a place where mammoth ivory was collected, worked and exported. In contrast, a much smaller surviving body of material was recovered from Paviland, and it is possible that it was only a short term workshop based upon the exploitation of one mammoth which happened to die or was killed in the vicinity (see Buckland 1823,84). An attempt could be made to test this hypothesis by radiometric dating, but until that time, it must remain only a theory.

The Spy ivory industry has been attributed to the Aurignacian on the basis of an apparent association with stone tools of that period (De Puydt and Lohest 1886,17; Otte 1979,311-312; Dewez 1981,30), but this has never been proved; there is no radiocarbon date for the ivory industry. The Paviland worked ivory has generally been assumed to be Aurignacian (Jacobi 1980,31), because of its similarity to the Spy material, which as we have seen is of unproven age, so the argument becomes somewhat circular. Proceedings are underway to date a piece of worked ivory from Paviland as well as a piece of tusk, from which it is believed that ivory was extracted for working, by radiocarbon accelerator dating. However, as has been stated above (Chapter 4: Ivory Rods), ivory need not be fresh

when it is worked, and so such a date would only provide a terminus post quem, but that should at least help narrow the field.

The specimen from the Magdalenian site of Chaleux and those from the Gravettian site of Maisières Canal clearly give some indication of their ages. Apart from these few specimens, all the ivory rods come from multiperiod sites, and until a reasonable sample of these pieces can undergo radiometric dating, it is impossible to know whether or not these pieces were contemporary, and if so to which period they belonged. If this information were available, it would be possible to attempt to pinpoint those sites to which ivory rods were exported from Spy and Paviland. It would also be possible to consider whether the rods varied in appearance through time, or even in function. For in my study of these pieces (see Chapter 4: Ivory Rods), certain examples were identified as probable projectile points and others as bead blanks, but unfortunately this analysis cannot be taken any further, owing to the absence of essential chronological information.

The vast majority of the beads identified here come from Spy and are part of the ivory workshop assemblage, which has been attributed to the Aurignacian (see above). In the case of the beads, the attribution gains a certain amount of support from the fact that very similar bead industries have been found at the Aurignacian sites of Abri Castanet and Abri Blanchard in the Dordogne. A fragment of an ivory bead was found at Paviland, but its precise age is of course unknown. Likewise, a much smaller number of beads of a very similar shape to those from Spy were recovered from Goyet. Given the vast amount of ivory working at Spy, it is entirely possible that such beads were exported from Spy to Goyet. However, without accurate absolute dating, the chronological relationship between the ivory beads of Spy and Goyet is most uncertain.

Ivory rings are certainly restricted in number, but still have a wide geographical distribution, in that they are found in sites in both Britain and Belgium. One example comes from an Aurignacian site, whereas the other two have been attributed to the same period on typological grounds (see among others Saccasyn della Santa 1946,40; Otte 1979,302), which is clearly not satisfactory.

Spatulae have a particularly restricted distribution, in that the three examples of this type were all found on the same site, and they are so similar to one another that it is probable that they were all made at the same time. In the absence of stratigraphic details, a sample has been taken from one specimen for radiocarbon accelerator dating in the hope of either confirming the Upper Palaeolithic age of this tool type, and showing to which particular stage it belonged, or else it may provide sufficiently definitive evidence to remove a wrongly attributed later type from the Upper Palaeolithic record.

Wedge-shaped segments appear to have been a restricted type in that they are few in number, but dating evidence is needed to define the limits of this type. The three Belgian specimens made from antler are very similar to a type which is current in the Magdalenian of South West France. One of these specimens comes from a Magdalenian site, one from an Ahrensburgian level, and the other piece is undated as it comes from a multiperiod site. Typological thinking would attribute the latter specimen to the Later Upper Palaeolithic, but as we have already seen, we should be wary of such attributions. A further two wedge-shaped segments which were made from other raw materials are probably of Upper Palaeolithic age, but nothing further is known of their age.

Bone segments with polish were found on only one site in two locations. These pieces conceivably come from the same layer, but there is no recorded, reliable stratigraphic information to confirm this. What is

required once again is direct radiocarbon accelerator dating of these pieces to show whether they can reasonably be considered as contemporary or not.

Five perforated bâtons have been recognised in the region of this study. Two examples come from the Later Upper Palaeolithic site of Gough's Cave; the other three came from multiperiod sites so their attribution is much more difficult, given that perforated bâtons certainly figured both in the Aurignacian and the Magdalenian in South West France. One bâton from the multiperiod site of Goyet shows elaborate incised decoration which might suggest that it belonged to the Magdalenian on the basis of comparison with South West France, where decorated, perforated bâtons tend to be a feature of that period. Even if this were the case, this would not help date the other (undecorated) bâton from the same site (Goyet) and also the other example which comes from the Grotte de Spy. It is entirely probable that this was a restricted type in age, but until these pieces are radiocarbon dated this cannot be confirmed.

The lozenge pattern of incised decoration clearly has a restricted distribution within the region of this study, being unique to the site of Maisières Canal. Parallels for this decoration (see Chapter 6: Pieces with a Lozenge Pattern) were identified by me in the Aurignacian of Czechoslovakia and in the Upper Palaeolithic of the Ukraine.

Category 3: This category consists of tool types, which furnish the best evidence for chronological and geographical variation. These tool types are:

Needles

Group 2 Points

Perforated Ivory Discs

Barbed Points

On present evidence we would have to say that needles were a Late Solutrean invention in the Vézère Valley (Dordogne) (see Chapter 5: Needles), which became generally current in the Magdalenian, and only spread to much of Europe outside France in the Upper Magdalenian. Most of the Belgian needles come from exclusively Magdalenian sites; the rest were found at complex, multiperiod sites, where their chronological and stratigraphic contexts are, to say the least, uncertain. Two of the British needles come from Later Upper Palaeolithic sites, while the other two came from multiperiod sites, though one of these, Kent's 6, was found in what appears to have been a Later Upper Palaeolithic context (Pengelly 1869,191). There is certainly no evidence to suggest that needles were independently invented in, or spread to, these areas prior to the Upper Magdalenian, and in the absence of any relevant chronological information on the multiperiod sites, it is thought here that they were a Later Upper Palaeolithic invention, associated with a new method of sewing (see Chapter 5: Needles). It would have been most interesting to look for implements used for sewing prior to the invention of the needle. The use among certain peoples of awls for sewing has been noted here (see Chapter 5: Needles), and I would have liked to have been able to check whether certain types of point were more commonly found before the invention of the needle and then declined in use afterwards. However, the necessary chronological information was not available.

In contrast to the Groups 1,3 and 4 Points (see Category 1), the Group 2 Points are a highly specialised tool type. One sort of Group 2 Point is made from fox and hare ulnae, and appears to be restricted in its distribution to Pin Hole Cave, and possibly Gough's Cave; the age of these pieces is not known. The other type in this group is made from hare tibiae, and has been found at two sites studied here. Both of these sites have been dated to the Later Upper Palaeolithic. They are such distinctive

artifacts that they must surely be witness to some form of contact between the two sites. I could not identify any pieces of this nature among the Belgian collections, although the necessary raw materials were certainly available in abundance at the Magdalenian site of Chaleux for example, where a large number of rabbit bones were identified by Otte and Téheux (1986,67) among the faunal remains excavated by them.

The two perforated ivory discs studied by me both came from a Magdalenian site, which is a reasonably secure context. What appears to be a fragment of a third example has been recognised among the great abundance of material at Spy. Owing to its similarity to the specimens from Chaleux, this piece is thought to be Magdalenian (Otte 1979,310; Dewez 1981a,68). This is probable, but of course not certain.

Barbed points are certainly a feature of the later stages of Magdalenian in the south west of France (de Sonneville-Bordes 1960,335). Many of the British and Belgian examples come from four recognised Later Upper Palaeolithic sites (see Chapter 4: Barbed Points); there are also four barbed points from two multiperiod sites. It is improbable that any British and Belgian barbed points predated those in South West France. Thus, it seems likely that barbed points were indeed a Later Upper Palaeolithic invention, that is a post-Glacial Maximum invention, which may have been somehow an adaptation to changing environmental conditions, or prey, or else a new fashion in hunting. As remarked in the text (see Chapter 4: Barbed Points), there is a striking similarity in appearance between the examples from Goyet and Aveline's, which strongly suggests that there was some contact between the two areas.

Unfinished pieces were identified at Coléoptère and Verlaine, which suggests that they were manufactured on-site. Such débris has not been identified at Kent's Cavern where three barbed points were found, but as no modern, properly controlled excavations have ever taken place there, we

have no way of knowing if this was indeed the case. It is, however, worth noting that barbed points are quite complex artifacts, which would require a not inconsiderble investment of time and effort, so would not be casually abandoned, but rather, carefully repaired (for example Goyet 109 and Kent's 2) and kept, and perhaps in many cases actually carried out of the region of this study by their owners.

Review of Activities Suggested by the Osseous Artifacts

Having described the technological aspects of my sample of osseous artifacts, and discussed the nature of their relationships through time and from region to region, this now seems to me to be a suitable point at which to reflect on the activities to which these osseous implements may be said to bear witness. One important consideration concerns how this evidence differs from that which may be obtained from a similar stone tool assemblage. Examples of this include the direct evidence for sewing provided by the discovery of bone and antler needles, for the manufacture of decorative objects and indirect evidence from burials for the trimming of garments with such objects including beads and perforated teeth. The recognition of possible whistles and apparently decorative engravings on bone and antler provides evidence for certain artistic or at least non mundane activities, which is not present to the same degree in the corresponding lithic assemblages.

Direct evidence for the hunting of animals in the region of this study is furnished by the High Furlong deposit, where two uniserial barbed points were found so closely associated with an elk skeleton, that they must have once been embedded in the body of the animal. There is also evidence from outside the time and region of this study that some Mesolithic barbed points were used for fishing (Clark 1975,143-144) (see

Chapter 4: Barbed Points). Artistic representations from the period under consideration in South West France seem to show the use of barbed points against both fish and mammals. On the basis of the similarity of such pieces to Eskimo and North American Indian examples, it seems that they may have been used either as fixed or detachable projectile heads. Their technology appeared to confirm that both types may have been in use and this is discussed in some detail in the text. The method by which they may have been projected is described below. It is probable that the various subgroups of the Group 4 points, such as whittled-based points, and certain Group 4 points, antler rods and ivory rods were also used as projectiles for hunting, and conceivably fishing as well. Fish remains were identified at a number of sites including Trou Magrite and Trou du Frontal (Dupont 1872,89,200). Two fish-shaped pendants in the collections, from Fond-de-Forêt and Verlaine, could be interpreted as fish-lures, in the manner suggested by de Saint-Périer (1928) for certain French artifacts of this period. No fish hooks were recognised among the collections studied here; the spindle-shaped points could be interpreted as connecting elements from composite projectiles or as fish gorges. It was also remarked in the text (Chapter 4: Group 4) that Hoyle 1 and Goyet 65 resembled very large needles illustrated by de Saint-Périer (1928), which were used for attaching fish to a line, so that they could be conveniently carried.

The ethnographic evidence suggests (Birket-Smith 1959; Kluckhohn et al. 1971) that other hunting devices which will have left no traces may have been used. They may have included pits, traps and snares. Similarly, fishing equipment may have included wooden spears which were used to stab the fish. Fish nets and traps may also have been constructed, out of sinew or vegetable fibre; however, no such evidence survives from this period,

so that this is mere speculation though it is at least informed by surviving Mesolithic examples a few millennia younger (Clark 1948,55).

With regard to the hypothetical osseous point-tipped spearhead, it is not clear how it was projected. Certainly no spear-throwers of the type identified in the Magdalenian in Europe (Garrod 1955) have been recognised in the region of this study, nor is there any evidence for the use of the bow in this region during this period. Therefore, in the present state of evidence, we can only assume that these projectiles were propelled by the human arm alone.

There is evidence among the faunal remains for selective hunting in this region, for at Chaleux the predominance of horse among the animal bones was noted by van Beneden et al. (1865,56), with little representation of reindeer, except in the form of a small number of antlers. This pattern was again observed by Otte and Téheux as a result of their excavations, and who suggested (1986,67) that some form of specialised hunting might have been practised, which they compared to that indicated at the Magdalenian site of Petersfels in Southern Germany (see Bosinski 1981,58). There is evidence for such specialised hunting of either horse or reindeer elsewhere in Europe during the Magdalenian (Phillips 1980,94-95). This interesting topic is clearly peripheral to this thesis, and I found from the brief review that I made of the relevant published faunal lists that what is really needed is for a palaeontologist to make a detailed study of the actual faunal remains, for the lists rarely give the necessary information. In this way, it might be possible to show whether different Magdalenian groups in this area practised selective hunting.

The pursuit of mammals would result in the obtaining of meat for food, the hide or fur for clothes, tent-coverings, or possibly as blankets, rugs and wall-hangings to make caves rather more hospitable places. The bones

would have been collected in order to extract the nourishing marrow; they could also have been used for tool-making, along with antlers and tusks. Another use that they could have been put to would be to keep the fire going when wood was in short supply (Soffer 1985,255). Mammoth bones were also used in the Ukraine for the construction of shelters (Phillips 1980,Plate 3); the most commonly used elements appear to have been mandibles, scapulae and femurs. Animal sinew could have been used for sewing.

The osseous tool kit provides excellent evidence for sewing in the Upper Palaeolithic, in the form of needles in the later part of the period, as well as pins and awls. Thread may have been made from sinew or vegetable fibre, for which there is no archaeological evidence in the region of this study.

The animal hides must have been cleaned and cured, and then could have been used to make clothes, footwear and containers. The hide-working process may have been carried out using bone segments with polish, and other stone and bone artifacts, which are generally as yet unrecognised, as they received little modification, for example Chaleux 103 (see Chapter 5: Miscellaneous:3). Perforated bâtons may have been used in the manner described by Semenov (1964,191) for softening and stretching leather thongs for manufacture into clothes and footwear. The frequent presence of red ochre on these sites is surely significant, as it may have been used in hide working for its preservative and vermin-repellant qualities (Sollas 1915,233; Davies 1925,107).

Containers for carrying liquids, nuts and berries etc. could have been made from skins or animal stomachs in the manner of the !Kung bushmen (Fagan and Van Noten 1966,Plate XVI), but none have survived. The production of birch-bark baskets and coiled basketry from vegetable fibres has been documented ethnographically, though no remains of such artifacts

are known in the region of this study. However, some of the many hand-held points identified here may have been used in basketry. The digging by the Eskimo of pits into the frozen ground in order to provide efficient cold storage for meat is recorded by Giddings (1967,28), and this may have been a technique used in this region during the Upper Palaeolithic, but evidence for this is lacking.

Evidence for artistic expression may be identified among the implements described here; such pieces include beads, pendants and mobiliary art. The perforated ivory discs and the beads may also have been functional, used as buttons, or possibly in the case of the Type j beads as toggles. Perforated shells and beads may have been worn as beads or charms, or even used to trim garments, as is suggested by certain burial remains (see Chapter 6: Perforated Teeth). No parietal art has been identified in the region of this study.

It is possible, as was suggested by Dewez (1974) that games were played at this time, and that the osseous artifacts may include pieces from such pastimes. Music may have been played for entertainment on the perforated bones which have been interpreted as whistles, although other possible uses such as in healing the sick, and in hunting have been documented ethnographically (Kluckhohn et al.1971,361).

Wedge-shaped segments could be put forward as evidence for tool-making, that is for wedging open antler or wood, for example. No soft hammers for flint knapping were recognised. The various pieces of limb bone such as Verlaine 34 which bore apparent traces of impact on their surfaces may have been used to rest a piece of stone on, while it was being worked (see Chapter 6: Working débris). A piece of limb bone from Maisières Canal (Number 43) was labelled 'percuteur', but it showed no signs of having been used as such. If perforated bâtons were genuinely used for straightening antler rods or wooden shafts, then they too provide

evidence for tool making as another activity carried out with osseous implements.

From this brief and sometimes speculative review of the activities which may have been carried out with osseous implements during the Upper Palaeolithic, it is clear to me that osseous implements could have formed a central part of the whole tool-kit, rather than having been used for a small number of peripheral activities. The examination of recent Eskimo assemblages certainly suggests as much. For this reason, and because of the wealth of the technological information which can be derived from them, they should be given a more prominent place when the archaeological remains from a site are considered.

Bibliography

Abbreviations

BSPF = Bulletin de la Société Préhistorique Française
BSRBAP = Bulletin de la Société Royale Belge d'Anthropologie et de Préhistoire
PPS = Proceedings of the Prehistoric Society
QJGS = Quaterly Journal of the Geological Society
UBSS = Proceedings of the University of Bristol Spelaeological Society

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Appendix 1

Inventory

This section contains a list of all the British and Belgian Upper Palaeolithic sites considered here, and of the osseous artifacts found on these sites which I have examined. The inventory of British sites is based on that published by Campbell in 1977, although this study contains full detailed lists of the osseous implements, as well as the name of the museum in which each artifact is held and any further information which might help later researchers to identify them more easily. For in the preparation of this thesis, the finding and identification of artifacts proved to be a time-consuming process, and I would have been greatly helped if a list such as I have now produced had been in existence.

Each artifact which was examined by me in detail and discussed in the text has been given a site serial number, which may be found to the left of each entry in the inventory. This serial number is referred to in the text in conjunction with the site name, as for example Paviland 10 or Church Hole 1; every object thus has its own serial number, and any quoted serial number relates to a single object only. The museum number, where it is known, is listed to the right of each entry. In those cases where any stratigraphic information was recorded on an accompanying label, or on an actual artifact, it too is listed to the right of each entry. Within certain collections, numerous unfinished artifacts or pieces of working débris were identified by me, but owing to constraints on time and money, it was not possible for me to examine all those pieces in the same detail as those artifacts with serial numbers. For this reason, pieces of this nature are listed after the numbered artifacts under the heading "Working Débris".

The abbreviations used for names of museums in the inventory are listed below:-

BM - British Museum
BM(NH) - British Museum (Natural History)
CCM - Cheddar Caves Museum
MM - Manchester Museum
NMW - National Museum of Wales
OUM - Oxford University Museum
RISW - Royal Institution of South Wales, Swansea
TNHS - Torquay Natural History Society Museum

IRSNB - Institut Royal des Sciences Naturelles de Belgique
MRAH - Musées Royaux d'Art et d'Histoire, *Parc du Cinquantenaire

* This museum is also sometimes referred to as the Cinquantenaire Museum in the text

British Upper Palaeolithic Sites

Site Number 1
Paviland Cave, Rhosili, Gower Peninsula, West Glamorgan
SS 437 859 (Campbell 1977:II:102)
Excavations:- Davies, Dillwyn and Talbot 1823
Buckland 1823
Wood c1869
Vivian 1909
Chambers and Morgan 1911
Sollas 1912
Rutter 1943
Publications:- Buckland 1823
Sollas 1913
Garrod 1926
Rutter and Allen 1948
Campbell 1977,1986
Jacobi 1980

Description:-All the major British Upper Palaeolithic stone tool industries appear to be represented at this site; for the Earlier Upper Palaeolithic, there is a 'Lincombian' or early leaf point assemblage, as well as Aurignacian and Upper Perigordian or 'Maisierian' industries. The Later Upper Palaeolithic is represented by a Creswellian or Federmesser assemblage (Campbell 1980,1986; Jacobi 1980). It is not known which of these assemblages is associated with the burial in the cave of the 'Red Lady' skeleton, found as long ago as 1823, which has been radiocarbon dated to 18 460 ± 340 years BP (BM-374) (Campbell 1977:II:19). A

radiocarbon accelerator date of 7190 ± 80 years BP (OxA-681) has been obtained from the human humerus (Paviland 2) found by Sollas (Gowlett et al. 1986,216). Two radiocarbon accelerator dates have also been obtained from charred animal bone found in the cave; these are 29 600 ± 1900 years BP (OxA-365) and 28 000 ± 1700 years BP (OxA-366) (Gowlett et al. 1986,119). The associations of the osseous artifacts are also uncertain; however, the ivory component is generally thought to have been associated with the Aurignacian, on the basis of comparison with the ivory industry found at the Grotte de Spy. The relatively large number of ivory artifacts found on this site, including apparently unfinished examples, suggests that an ivory workshop of short duration, compared with that witnessed at Spy, was located here. Most of the artifacts from Paviland considered here were recovered during the excavations of Buckland in 1823 and Sollas in 1912.

Collections:-

1	bone spataula	NMW 15.277/7
2	bone spatula	RISW 836.1.34
3	bone spatula	RISW 836.1.35
4	ivory rod Type (c)	BM(NH) M/416
5	ivory rod Type (c)	BM(NH) M/16
6	ivory rod Type (c)	OUM S.5092/12
7	ivory rod Type (c)	OUM S.5092/7
8	ivory rod Type (b)	OUM S.5092/8
9	ivory rod Type (c)	OUM S.5092/10
10	ivory rod Type (c)	OUM S.5092/15
11	ivory rod Type (c)	OUM S.5092/9
12	ivory rod Type (a)	OUM S.5092/13
13	ivory rod Type (b)	OUM S.5092/11
14	extracted and modified bone	OUM S.5099
15	ivory bead Type a	OUM S.5097
16	extracted and modified ivory	OUM S.5098
17	oval,ivory pendant	OUM Q3
18	modified piece of Elephas tusk	OUM S.5076
19	ivory with curvilinear incisions	OUM S.5091
20	ivory rod Type (a)	OUM S.5093/1
21	ivory rod Type (c)	OUM S.5093/2
22	ivory rod Type (c)	OUM S.5093/3
23	modified ivory	OUM S.6090
24	ivory rod Type (c)	OUM S.5080
25	ivory rod Type (c)	OUM -----
26	ivory rod Type (b)	OUM S.5084
27	ivory rod Type (c)	OUM S.5081
28	ivory rod Type (c)	OUM S.5082

29 ivory rod Type (c)	OUM S.5083
30 ivory rod Type (c)	OUM ------
31 ivory rod Type (c)	OUM ------
32 ivory rod Type (c)	OUM S.5092/13 & S.5084
33 ivory wedge-shaped segment	OUM ------
34 modified ivory	OUM S.5079
35 modified ivory	OUM S.5078
36 modified bone	OUM S.5094
37 extracted and modified bone	OUM S.5085
38 bone needle shaft	OUM S.5086
39 ivory needle blank	OUM S.5087
40 Group 4 bone point	OUM S.5088
41 Group 4 bone point	OUM S.5089
42 6 desiccated ivory rods Types (b) & (c)	OUM S.5089
43 (6 segments of an) ivory ring	OUM S.5075a & b
44 4 modified fragments of bone and ivory	Ashmolean 1968.1745
45 perforated fox canine	RISW ------
46 perforated fox canine	RISW ------
47 perforated fox canine	RISW ------
48 perforated deer canine	OUM S.5095
49 perforated deer canine	OUM S.5096
5 ochre encrusted shells	OUM Q.1582-Q.1586
Littorina littorea	

Site Number 2
Cat Hole, Parkmill, Gower Peninsula, West Glamorgan
SS 538 900 (Campbell 1977:II:118)
Excavations:- Wood 1860s
McBurney 1958-59
Campbell 1968
Publications:- Garrod 1926
McBurney 1959
Campbell 1977

Description:- On the basis of stone tool typology, occupation of this site has been attributed to the Later Upper Palaeolithic. The only bone artifacts found in this cave were recovered during McBurney's excavations.

Collection:-
1 bone needle shaft NMW

Site Number 3
Little Hoyle Cave, Penally, Dyfed
also known as Longbury Bank
SS 112 999 (Campbell 1977:II:104)
Excavations:- Rev. Winwood 1866
Rev. Smith 1870
Laws and Power 1876
Pitt-Rivers and Rollestone 1877-78
McBurney 1958
Green 1984-86
Publications:- Laws 1878
Rollestone et al. 1878
McBurney 1959

Campbell 1977
Green 1986

Description:- There certainly appears to have been an Upper Palaeolithic occupation of this site, but it is not certain whether the bone point found by Laws and Power may be dated to this period, although it appears to have "come from the surface of a probably Pleistocene deposit" (Green 1986,101).

Collection:-
1 perforated Group 4 bone point Tenby Museum 1983 2389

Site Number 4
Ogof Garreg Hir, Bosherton, Dyfed
SR c950 940 (Campbell 1977:II:121)
Excavations:- Davies and Kennedy 1972
Publications:- Davies 1977
Campbell 1977

Description:- The two stone tools found at the site have been provisionally attributed to the Later Upper Palaeolithic/Mesolithic. It is therefore not certain that the bone point belongs to the Upper Palaeolithic.

Collection:-
1 Group 1 bone point Melvyn Davies' private collection

Site Number 5
Upper Kendrick's Cave, Llandudno, Gwynedd
SH 780 828 (Campbell 1977:II:123)
Excavations:- Kendrick 1879-1880
Stone and Davies 1977-1979
Publications:- Sieveking 1971
Campbell 1977
Davies 1983

Description:- The unusual range of finds from this cave (see Sieveking 1971) indicates that it has been occupied at various stages throughout prehistory. The one piece which may reliably be said to belong to the Upper Palaeolithic is the decorated horse mandible, not examined by me, which has been radiocarbon accelerator dated to 10 000 ± 200 years BP

(OxA-111) (Gillespie et al., 1985,238). There is no evidence to prove that the teeth were deposited at the same time as the mandible.

Collections:-

1	perforated and decorated tooth	NMW 80.92.H/8
2	perforated and decorated tooth	NMW 80.92.H/9
3	perforated and decorated tooth	NMW 80.92.H/7
4	perforated and decorated tooth	NMW 80.92.H/1
5	perforated and decorated tooth	NMW 80.92.H/5
6	perforated and decorated tooth	NMW 80.92.H/4
7	perforated and decorated tooth	NMW 80.92.H/6
8	perforated and decorated tooth	NMW 80.92.H/2
9	perforated and decorated tooth	NMW 80.92.H/3
10	perforated and decorated tooth	Melvyn Davies' private collection

Site Number 6
Ffynnon Beuno, Tremeirchion, Clwyd
SJ 086 725 (Campbell 1977:II:105)
Excavations:- Hicks and Luxmore 1885
Publications:- Hicks 1886
Garrod 1926
Campbell 1977

Description:- Campbell attributes the artifacts from this site to the Earlier Upper Palaeolithic. They include a perforated piece of bone, which I class as a pendant, found by Hicks, which is on loan to the National Museum of Wales.

Collection:-

1 bone pendant	BM(NH) E.197 on loan to NMW

Site Number 7
High Furlong, Poulton-le-Fylde, Lancashire
SD 331 387 (Campbell 1977:II:124)
Excavations:- Audus, Hallam and Scholey 1970
Publications:- Barnes, Edwards, Hallam and Stuart 1971
Hallam, Edwards, Barnes and Stuart 1973
Noe-Nygaard 1974, 1975
Stuart 1976
Jacobi et al. 1986

Description:- This is a most unusual assemblage in that it consists of two barbed points in very close association with an elk skeleton. A radiocarbon accelerator date of 12 400 ± 300 years BP (OxA-150) has been obtained from the elk (Jacobi et al. 1986,123).

Collection:-
1 uniserial barbed point Harris Museum and Art Gallery, Preston
2 uniserial barbed point Harris Museum and Art Gallery, Preston
The elk skeleton is also held in the Harris Museum and Art Gallery, Preston.

Sites Number 8-11
Creswell Crags, near Worksop, Derbyshire/Nottinghamshire border
SK 535 742 (Campbell 1977:II:130)
Excavations:- Mello and Boyd Dawkins 1874-1878
Armstrong 1924-1928
McBurney 1959-1960
Campbell 1969
various unrecorded, amateur excavations
Publications:- Boyd Dawkins 1876,1877
Mello 1876,1877
Armstrong 1925,1928-29,1936
Garrod 1926
Kitching 1963
Jackson 1967
Campbell 1977

Description:- The work of the Rev. Magens Mello and Sir William Boyd Dawkins in the nineteenth century resulted in the recognition of a basic stratigraphy for the Creswell 'bone caves', whereby a lower red sand and clay deposit containing a small, crude quartzite industry was overlain by a layer of breccia and cave earth. In this upper level an Upper Palaeolithic flint industry was found, along with a small number of osseous artifacts. Later excavators such as Armstrong (1925) and Campbell (1977) have attempted to produce a finer stratigraphy with some internal divisions within the breccia and cave earth layer.

The osseous artifacts are listed below by site, with the following single exception:

Creswell
1 Group 4 bone point BM unregistered. It is not clear from which of the Creswell caves this artifact comes.

Site Number 8
Church Hole Cave, Holbeck, Nottinghamshire
SK 534 741 (Campbell 1977:II:129)

Description:- The stone tool industry at Church Hole has been attributed to the Later Upper Palaeolithic (Campbell 1977:II:129). This is supported by a radiocarbon accelerator date, obtained from an animal bone in the breccia, of 12 240 ± 150 years BP (OxA-735) (Gowlett et al. 1986,210). The artifacts listed below were found in the cave earth during the excavations of Mello and Boyd Dawkins, and are presumed to be associated.

Collection:-

1 bone needle	BM Christy Collection	+8166
2 notched bone	BM Christy Collection	+8165
3 antler rod Type (b)	BM Christy Collection	+8172
4 antler rod Type (b)	BM Christy Collection	+8171
5 antler rod Type (b)	BM Christy Collection	+8170
6 Group 2 bone point	BM Christy Collection	+8169
7 Group 2 bone point	BM Christy Collection	+8168

Site Number 9
Pin Hole Cave, Creswell, Derbyshire
SK 533 742 (Campbell 1977:II:106,136)

Description:- Both Earlier, that is Lincombian and Maisierian (Campbell 1986,13,19), and Later Upper Palaeolithic stone artifacts were found in this cave during Armstrong's excavations, along with the osseous artifacts listed below. However, it is not certain with which industries the osseous artifacts were linked, though Campbell attributes the worked ivory to the Earlier Upper Palaeolithic and Pin Hole 1 to the Later Upper Palaeolithic (1977:I:148,174). The attribution of particular artifacts is discussed in the text.

Collections:-

1	engraving of a human figure on rib bone	BM Armstrong Coll. 1933.1-9.1
2	ivory rod Type (c) with incised spiral decoration	BM Armstrong Collection 1933.1-9.2
3	ivory rod Type (c) with incised spiral decoration	MM D/47/3'-6"
4	rib fragment with incised chevron decoration	MM 2'-6 79
5	ivory rod Type (c)	MM E/50/3'
6	ivory rod Type (a)	MM F/3'
7	ivory rod Type (c)	MM D/50/5.6"
8	ivory rod Type (a)	MM D/6'/47'
9	ivory pendant	MM D/45/5'-6
10	Group 1 bone point	MM C/40'/5'-6'
11	Group 2 bone point	MM 56'/2'-6"
12	perforated bone	MM 12'p

13 perforated bone	MM ----
14 perforated bone	MM ----
15 incised bone	MM ----
16 incised bone	MM C/3'
17 incised bone	MM E/50/3'-6
18 sawn off articular end	MM B/31/1'-6 (44)
Littorina obtusata shell	MM 35/4'-4"

Site Number 10
Robin Hood's Cave, Creswell Crags, Derbyshire
SK 534 742 (Campbell 1977:II:107,137)

Description:- There appear to be both Earlier and Later Upper Palaeolithic assemblages in this cave. The bone tools that I have managed to find from this site were recovered by Mello and Boyd Dawkins and their attribution is again uncertain, although Campbell has suggested that the engraving may have been part of the Earlier Upper Palaeolithic industry (Campbell, 1977:I:149).

Collection:-

1 Group 1 bone point	BM Christy Collection +8167
2 engraving of a horse's head on bone	BM Christy Collection +8164

Site Number 11
Mother Grundy's Parlour, Creswell Crags, Derbyshire
SK 536 743 (Campbell 1977:II:132)

Description:- The stone artifacts from this site have been attributed to the Later Upper Palaeolithic by Campbell. The osseous artifacts listed below were all found during Armstrong's excavations, and are presumably of the same age as the lithics.

Collection:-

1 bone with curving incisions	BM unregistered
2 incised bone	BM 1937 7-12.10
3 incised bone	BM 1937 7-12.11
4 bone with curving incisions	BM 1937 7-12.12
5 incised bone	BM MGP.B
6 modified bone	BM 1937.7-12.13
7 possible segment of antler rod Type (b)	BM 1937.7-12.15
8 modified bone	BM 1937.7-12.16

Site Number 12
Fox Hole Cave, High Wheeldon, Derbyshire
SK 100 662 (Campbell 1977:II:131)
Excavations:- Bramwell 1961-1975

Publications:- Bramwell 1971
Campbell 1977

Descriptions:- There appears to have been some Later Upper Palaeolithic occupation of this site, witnessed by characteristic types of stone tool, with which the osseous artifacts listed below were probably associated.

Collection:-
1 antler rod Type (b) Buxton Museum
2 antler rod Type (b) Buxton Museum

Site Number 13
Gough's (New) Cave, Cheddar, Somerset
ST 467 539 (Campbell 1977:II:114)
Excavations:- Gough 1892-1903
Parry 1927-1931
Painter 1948-1953
Publications:- Davies 1904
Seligman and Parsons 1914
Garrod 1926
Parry 1928,1930
Clay 1929
Donovan 1955
Beck 1965
Hawkes,Tratman and Powers 1970
Tratman 1950-52,1975,1976
Campbell 1977
Burleigh,Jacobi and Jacobi 1985
Jacobi 1985
Jacobi et al. 1985 and 1986 UBSS

Description:- This is one of the richest Upper Palaeolithic sites in Britain. Over 7000 stone artifacts were found there (Campbell 1977:I:8), as well as a substantial number of osseous artifacts. Unfortunately, most of the stone tools have been lost. This assemblage is attributed to both Later Upper Palaeolithic and Mesolithic occupations. This is confirmed by a series of radiocarbon accelerator dates (Gillespie et al. 1985; Gowlett et al. 1986,1986,1987; Burleigh et al. 1985). The artifacts listed below were recovered during Parry's excavations, and are generally believed to have belonged to the Upper Palaeolithic.

Collection:-
1 Group 2 bone point CCM 1.5/60 16
2 Group 2 bone point CCM 1.5/56 10

3	Group 2 bone point	CCM	1.5/57 14
4	Group 2 bone point	CCM	1.5/45 13
5	Group 2 bone point with grouped incisions	CCM	---------
6	Group 3 bone point	CCM	1.5/42 8
7	bone "tally"	CCM	--------
8	extracted rib	CCM	1.5/23
9	antler perforated bâton	CCM	--------
10	modified bone	CCM	1.5/65 14
11	modified tibia	CCM	M/11856 6

Site Number 14
Aveline's Hole, Burrington, Somerset
ST 476 587 (Campbell 1977:II:112)
Excavations:- Buckland before 1823
Boyd Dawkins 1860,1864
Davies 1921-1925
various other, unrecorded excavations
Publications:- Davies 1920-21,1922,1923,1925
Garrod 1926
Campbell 1977
Tratman 1977

Description:- The stone artifacts found at this site have been attributed to the Later Upper Palaeolithic (Campbell 1977:II:112), and this is supported by their association with a barbed point, which was found during Davies' excavations. A number of dates obtained from the mass of the human remains in the caves suggest that they, however, are of early Mesolithic date (Tratman 1977; Gowlett et al. 1986,1987), although a date obtained from a cut bovine phalange of 12 380 ± 130 years BP (OxA-1121)(Gowlett et al. 1987,290) would be in line with the presence of Later Upper Palaeolithic activity at the site. Most of the finds made at this site have either been lost or were destroyed during the Second World War. Two very inaccurate casts of the barbed point survive, one of which is held in the collections of the University of Bristol Speleological Society and the other in the British Museum (Natural History).

Collection:-
1 biserial barbed point (replica) BM(NH) E.1594

Site Number 15
Hyaena Den, Wookey Hole, Somerset
ST 532 479 (Campbell 1977:II:99)
Excavations:- Boyd Dawkins 1859-74
Balch 1877-80

Publications:- Boyd Dawkins 1862,1863,1874
Garrod 1926
Tratman, Donovan and Campbell 1971
Campbell 1977

Description:- There appears to have been some Earlier Upper Palaeolithic activity at this site to judge from the presence of the Lincombian industry recognised by Campbell (1986,13). The bone object noted below was apparently donated to the museum in 1895 by a Mr F. Brooks. Its context is unknown.

Collection:-
1 bone rod Wells Museum 1484

Site Number 16
Kent's Cavern, Torquay, Devonshire
SX 934 641 (Campbell 1977:II:97,110)
Excavations:- MacEnery 1825-1829
Pengelly 1865-1880
Ogilvie 1926-1940
various other unrecorded, amateur excavations
Publications:- Vivian 1847
Pengelly 1865-1880
Evans 1872
Garrod 1926
Dowie 1928
Campbell and Sampson 1971
Campbell 1977,1986
Jacobi 1980
Jacobi, Jacobi and Burleigh 1986

Description:- All four main industrial traditions of the British Upper Palaeolithic are represented at Kent's Cavern in the form of a 'Lincombian' or early leaf point assemblage, as well as Aurignacian and Upper Perigordian or 'Maisierian' elements and Later Upper Palaeolithic in the form of Creswellian or Federmesser implements (Jacobi 1980; Campbell 1980,1986). There was also a later prehistoric occupation of the site above the granular stalagmite, which seals the Late Glacial occupation. A number of radiocarbon dates have been obtained from pieces of unworked bone, though one example was burnt, from Upper Palaeolithic

contexts (Campbell and Sampson 1971,36; Jacobi et al. 1986,10). A series of dates obtained from humanly modified bone would give a stronger indication of when the cave was occupied by human groups, and it is to be hoped that a dating programme of this kind will be initiated in due course. All the osseous artifacts listed below were found by Pengelly in the Vestibule in 1866 and 1867, where both Earlier and Later Upper Palaeolithic industries are represented. The attributions of particular artifacts are discussed in the text.

Collections:-

1	bone pin	BM(NH) E.86
2	biserial barbed point	BM(NH) E.70
3	uniserial barbed point	TNHS .2206
4	uniserial barbed point (replica)	TNHS .2282 = a cast
5	ivory rod Type (a)	TNHS .1963
6	bone needle	TNHS .408
7	Group 3 bone point	TNHS .1835
10	perforated wolf incisor	BM(NH) E.72

Two other possible Upper Palaeolithic bone artifacts from the cave, which have not been definitely identified as such:-

8	Group 1 bone point	OUM S.4031
9	Group 1 bone point	TNHS .370

Site Number 17

Torbryan Caves, Torbryan, Devonshire
SX 815 675 (Campbell 1977:II:111)
Excavations:- Widger c1865-1890 in all the caves in the Torbryan Valley
Ogilvie c1936-1939 at Tornewton Cave
Sutcliffe and Zeuner 1944-1960 at Tornewton Cave
Publications:- Widger 1880
Sutcliffe and Zeuner 1957/58
Walker and Sutcliffe 1967

Description:- There is a collection of three awls in the BM(NH) labelled from "Broken Cavern" (Higher Cavern) in the Torbryan valley. They were part of Widger's collection and are described as being from under the stalagmite floor. They may well be of Upper Palaeolithic age. The other (stone) artifacts in this collection have been attributed to the Later Upper Palaeolithic by Campbell.

Collection:-

1	Group 1 bone point	BM(NH) E.3830
2	Group 1 bone point	BM(NH) E.3829

3 Group 4 antler point BM(NH) E.239a

Belgian Upper Palaeolithic Sites

Site Number 1
Trou du Frontal, Furfooz, Lesse Valley, Province de Namur
Excavations:- Dupont 1864
Rahir 1900-1902
Publications:- Dupont 1872
Van Den Broeck 1900-1901
Rahir 1914

Description:- This cave contained an Upper Magdalenian occupation, which was directly covered by a Neolithic layer. A radiocarbon date (Lv 1135) 10 720 ± 120 years BP (Gilot 1984,121) has been obtained from cut splinters of bone excavated by Dupont, which might seem a little late for the Magdalenian. All the osseous artifacts listed below are believed to to have belonged to the Magdalenian occupation.

Collection:- MRAH - Rahir:-
1 needle (Rahir 1914, Fig.6,No.10)
2 needle
3 needle blank
4 Group 4 bone point
5 antler working débris associated with needle manufacture
6 Group 3 bone point
7 antler working débris associated with needle manufacture
8 antler working débris associated with needle manufacture
9 Group 4 bone point
10 needle blank (possibly Rahir 1914, Fig.6,No.8)
11 extracted and modified bone
12 Group 4 bone point
13 Group 4 bone point (possibly Rahir 1914. Fig.6,No.9)

Collection:- IRSNB - Dupont:-
14 bone working débris associated with needle manufacture (Dupont 1872, 152)
15 extracted and modified ivory
16 Group 3 bone point
17 Group 3 ivory point
18 bone working débris associated with blank extraction
19 modified bone
20 incised, sawn off articular end
21 extracted and modified ivory
22 antler rod Type (a)
23 needle blank (replica) (2859)
24 needle blank (replica) (2859)
25 needle (2859)
26 needle (2859)

27 needle shaft (2859)
28 needle (2859)
29 needle (2859)
30 antler working débris associated with needle manufacture
31 antler rod Type (b) (2859)
32 bone needle blank

"Working Débris": burnt bone fragments c41
modified bone 25
extracted bone 1

Site Number 2
Trou des Nutons, Furfooz, Lesse Valley, Province de Namur
Excavations:- Dupont 1864
Publications:- Dupont 1872

Description:- This cave contains an Upper Magdalenian occupation below a Neolithic level. The Magdalenian layer has been radiocarbon dated from splinters of cut bone to (Lv 1137) 7 720 ± 110 years BP (Gilot 1984,121), which seems remarkably late and inconsistent with other dating evidence for the Magdalenian in Belgium. The artifacts listed below are believed to have come from the Upper Palaeolithic occupation.

Collection:- IRSNB - Dupont:-
1 antler rod Type (a)
2 pointed antler rod Type (a)
3 pointed antler rod Type (a)
4 antler rod Type (a) (.2718)
5 unfinished antler rod Type (a)
6 unfinished Group 1 bone point (.2718)
7 modified bone (.2718)
8 engraving of a bison on antler

Working Débris: modified bone 67
antler working débris associated with blank extraction 3

Site Number 3
Trou du Renard, Furfooz, Lesse Valley, Province de Namur
Excavations:- Rahir 1900-1902
Publications:- Van Den Broeck 1900-1901
Rahir 1914
Otte 1976,1979

Description:- This cave contained two archaeological levels separated by a few metres of deposit. Rahir (1914) identified the lower layer as an Aurignacian occupation and the assemblage in the upper level as an

atypical Magdalenian industry. However, Otte (1976,1979) attributes the lower level to the Mousterian and the upper level to an evolved Aurignacian, for which a radiocarbon date of (Lv 721) 24 530 ± 470 years BP (Gilot 1984,119) has been obtained from bone splinters associated with the hearths found by Rahir. The bone tools come from the upper level.

Collection:- MRAH - Rahir:-
1 Group 3(i) bone point
2 Group 3 bone point
3 bone incised with chevron pattern
4 Group 3 bone point
5 extracted bone
6 extracted and modified ivory
7 extracted rib bone
8 extracted and modified rib bone
9 extracted rib bone
10 extracted rib bone

Site Number 4
Trou de Chaleux, Hulsonniaux, Lesse Valley, Province de Namur
Excavations:- Dupont 1865-1868
Rahir 1900-1902
Téheux 1985-1987
Publications:- Van Beneden,Hauzer and Dupont 1865
Dupont 1872
Rahir 1914,1920
Dewez 1979
Téheux 1985, 1985a
Otte and Téheux 1986

Description:- This cave contains a very homogeneous Magdalenian industry with only a few traces of the Middle Palaeolithic (Dewez 1979,157). The Magdalenian occupation was sealed by a thick layer of rocks, which in turn was covered with a layer of yellow clay, which formed the floor of the cave in the nineteenth century (1872,134-135). A radiocarbon date of (Lv-1136) 12 710 ± 150 years BP (Gilot 1984,120-121) was obtained from cut bone splinters from Dupont's excavations. Two further dates were recently achieved from bone splinters taken from one stratigraphic unit during the excavations carried out by Téheux; these are (Lv 1568) 12 370 ± 170 years BP and (Lv 1569) 12 990 ± 140 years BP (Otte and Téheux 1986,67).

The Trou de Chaleux is cut out of a rock escarpment on the right bank of the Lesse, one kilometre south-west of Furfooz. It is the most important Magdalenian site in Belgium, because it has yielded a large and varied collection of artifacts from an undisturbed context. The abundance of artifacts is such that in 1865, between 8 and 31 May, Dupont's workmen recovered approximately 20 000 stone artifacts (van Beneden et al. 1865,57). The bone tool collection is also impressive in terms of both numbers of artifacts and in the variety of types. Only a very small number of bone tools were recovered during recent excavations in contrast to the earlier excavations, though a collection of about one thousand struck flints was made. The most exciting recent discovery was of a hearth, which gave Téheux and his team the opportunity to excavate this feature using modern methods. We can feel confident that the artifacts listed here belong to the Magdalenian level, especially since the recent excavations have proved the presence of such pieces in it.

Collection - MRAH - Rahir:-
1 antler rod Type (a) (B.980) (Rahir 1914,33)
2 wedge-shaped segment (Rahir 1914,34)

Collection:- IRSNB - Dupont:-
3 needle
4 needle blank (.2853)
5 bone working débris associated with needle manufacture
6 bone working débris associated with needle manufacture
7 bone working débris associated with needle manufacture
8 bone needle blank
9 bone needle blank (27?52)
10 distal needle (2716?)
11 needle blank (2713)
12 needle
13 distal needle
14 distal needle
15 distal needle
16 distal needle
17 distal needle
18 needle shaft
19 distal needle
20 distal needle
21 needle shaft
22 distal needle
23 needle blank
24 needle shaft

25 needle shaft
26 distal needle
27 distal needle
28 antler rod Type (a) (.2853)
29 antler rod Type (a) (.12853)
30 antler rod Type (a) (.2853)
31 antler rod Type (a) (.2853)
32 antler rod Type (a) (.2765?)
33 antler rod Type (a) (.2713)
34 antler rod Type (a) (.2713?)
35 antler rod Type (a) (.2653)
36 antler rod Type (a) (.2853)
37 antler rod Type (a) (.2853)
38 antler rod Type (a)
39 antler rod Type (a) (.8713)
40 antler rod Type (a)
41 antler rod Type (a) (.2694?)
42 antler rod Type (a) (.2853?)
43 pointed antler rod Type (a) (.2853)
44 pointed antler rod Type (a)
45 antler rod Type (a) (2717?)
46 antler rod Type (a) (.2853)
47 pointed antler rod Type (a) (.2694)
48 antler rod Type (a)
49 antler rod Type (a) (.2853)
50 antler rod Type (a) (.2853)
51 antler rod Type (a) (.2853)
52 pointed antler rod Type (a) (.2853)
53 antler rod Type (a) (.2853)
54 antler rod Type (b) (.2853)
55 2 pieces of antler rod Type (a) (.2694)
56 extracted and modified bone (2146?)
57 perforated antler tine (.2853)
58 bone working débris associated with needle manufacture
59 Group 4 bone point (.2853)
60 pointed antler rod Type (a) (.2853)
61 antler rod Type (b)
62 antler rod Type (b) (.2853)
63 pointed antler rod Type (a) (.2715 or .2713)
64 antler rod Type (b) (.2853)
65 pointed antler rod Type (a) (.2713)
66 extracted and modified antler
67 bone working débris associated with needle manufacture
68 bone working débris associated with needle manufacture
69 bone working débris associated with needle manufacture
70 bone working débris associated with needle manufacture
71 perforated bone
72 bone working débris associated with needle manufacture
73 antler working débris associated with needle manufacture
74 bone working débris associated with needle manufacture
75 antler rod Type (a)
76 Group 4 antler point
77 pointed antler rod Type (a)
78 Group 3 bone point
79 Group 3 bone point
80 Group 4 bone point
81 extracted and modified antler
82 antler working débris associated with needle manufacture (.2853)

83 antler rod Type (b) (.2853?)
84 sawn off segment of antler rod Type (a) (.2752?)
85 incised segment of rib bone (.2853)
86 bone with incised chevron decoration (.2853)
87 sawn off articular end
88 bone working débris associated with needle manufacture (.2691)
89 incised bird bone (.2853)
90 perforated bone "whistle" (.2853)
91 perforated bone
92 extracted bone
93 incised bird metatarsal
94 antler working débris associated with needle manufacture
95 bone working débris associated with needle manufacture
96 extracted and modified antler
97 incised segment of bird bone
98 incised segment of bird bone
99 incised segment of bird bone
100 extracted and modified bone
101 incised bone working débris associated with needle manufacture
102 extracted and modified bone
103 highly polished bone fragment
104 incised phalange
105 incised rib splinter
106 Group 4 bone point
107 modified bone
108 modified bone
109 incised bird bone (.2693)
110 perforated ivory disc
111 perforated ivory disc (.2853) (van Beneden et al.1865,58)
112 extracted and modified ivory
113 pointed ivory rod Type (c)

Collection:- Université de Liège - Téheux
114 extracted antler (CHA 07.94)
115 extracted and modified antler (CHA.R)
116 antler rod Type (a) (CHA.85.07.7)
117 pointed antler rod Type (a) (CHA.06.268)
118 antler working débris associated with blank extraction (CHA N7 10)
119 needle (CHA.R)
120 distal needle (CHA 06 123)
121 bone with minimal modification
122 bone with minimal modification (CHA P6 86)

Collection:- IRSNB - Dupont:-
"Working Débris": extracted pieces with no further modification 98
modified bone 83
modified antler 3
extracted and modified bone 40
extracted and modified antler 5
bones with minimal modification 24
working débris associated with blank extraction 10
burnt fragments, some modified 350

Site Number 5
Trou Magrite, Pont à Lesse, Lesse Valley, Province de Namur
Excavations:- Dupont 1864-1865, 1867
Rahir 1908
Rutot 1913-1914?

Toussaint 1976 "sondage de controle"

Publications:- Dupont 1872
Dewez 1979, 1985
Otte 1979

Description:- No material from this site appears as yet to have been radiocarbon dated. However, Dewez (1985) has recognised the following Upper Palaeolithic industries: Magdalenian at the top of the sequence, preceded by a layer of Maisierian or local Perigordian, a Final Aurignacian and a Typical Aurignacian. This site is particularly notable for the discovery of the first Belgian Upper Palaeolithic art objects during Dupont's excavations; these are a piece of antler with an incised design (Magrite 40) and a human figurine (Magrite 41). The attribution of such collections, made in the last century from multiperiod sites, is clearly very difficult. This is discussed in the relevant sections for each tool type in the text.

Collection:- MRAH - Rahir:-
1 Group 3 bone point, context unknown (B.1513)

Collection:- IRSNB - Rutot-Henrotin (labelled Aurignacien Sup. Niv.1):-
2 Group 4 spindle-shaped point (8409)
3 Group 4 split-based point (Exp. 138 2748)
4 Group 4 point
5 Group 4 bone point
6 Group 4 whittled-based point
7 Group 4 whittled-based point
8 Group 4 bone point
9 Group 3 bone point
10 Group 3 bone point
11 extracted and modified bone
12 pointed antler rod Type (a)

Collection:- IRSNB - Rutot (labelled Aurignacien Sup.):-
13 modified bone

Collection:- IRSNB - From display case- probably Rutot's excavations:-
14 Group 4 point
15 Group 4 point (2746 Exp.147)
16 Group 4 split-based point (2748 Exp.137)
17 Group 4 split-based point
18 Group 4 split-based point (2678 Exp.31)
19 Group 4 whittled-base point
20 Group 4 antler point
21 Group 4 antler point (2748 Exp.146)
22 modified ivory

23 extracted bone (2748 Exp.145)
24 antler rod Type (a) (2678 Exp.32)
25 Group 4 bone point (2678 Exp.39)
26 Group 1 bone point
27 metapodial with grouped incisions (2748 Exp.135)
28 incised antler (2748 Exp.142)
29 Group 1 bone point (8409)
30 Group 3 bone point (8409)
31 Group 1 bone point (2678)
32 needle shaft (2743 Exp.149)
33 Group 3(i) bone point (8409)
34 pointed antler rod Type (a) (2748 Exp.143)
35 Group 3(i) bone point (2678 Exp.35)
36 Group 4 point (PL12?)
37 pointed antler rod Type (b) (2673 Exp.40)
38 Group 1 bone point (PL12)
39 Group 3 bone point (2678 Exp.33)

Collection:- IRSNB - Dupont (labelled Aurignacien):-
40 antler with incised decoration
41 anthropomorphic figurine (2748 Ex1 152)
42 ivory rod Type (c)
43 Group 3 bone point
44 Group 4 antler point
45 extracted and modified ivory
46 Group 4 antler point

Collection:- IRSNB - Dupont(labelled Aurignacien Sup. and Mousterien):
47 Group 3 bone point
48 extracted and modified antler
49 extracted antler
50 extracted antler
51 incised, extracted and modified antler
52 modified antler tip
53 extracted and modified bone
54 Group 4 antler whittled-based point
55 Group 3 bone point
56 Group 3 bone point
57 Group 1 bone point
58 Group 4 point
59 Group 4 split-based point
60 Group 4 antler point
61 Group 4 split-based point
62 Group 4 point
63 ivory rod Type (b)
64 pointed antler rod Type (a)
65 Group 4 antler point
66 Group 4 split-based point
67 extracted and modified antler
68 Group 4 bone point
69 Group 4 point
70 extracted and modified bone
73 extracted bone

Collection:- IRSNB - From display:-
71 part of ivory ring or armlet
72 ivory bead Type k

"Working Débris":	Fouilles: Rutot-Henrotin	Dupont
extracted pieces with no further modification	10	-
modified bone	14	30
extracted and modified bone	7	-
bone with minimal modification	233	-
burnt fragments, some possibly modified	300	-

Site Number 6

Grotte de la Betche-aux-Rotches, Spy, Province de Namur

Excavations:- Rucquoy 1879
De Puydt and Lohest 1886
De Loë and Rahir 1906,1909
Hamal-Nandrin 1927,1933
Twiesselmann 1948-1956
Dewez 1979-80

Publications:- Rucquoy 1886-1887
De Puydt and Lohest 1886
De Loë and Rahir 1911
Chalon and De Puydt 1914
Hamal-Nandrin et al. 1939
Dewez 1960,1980,1981,1981a
Otte 1979

Description:- This is a remarkably complex site with remains of a series of both Middle and Upper Palaeolithic occupations, both within the cave itself and on the terrace outside. It is particularly famous for the discovery in 1886 of two Neanderthal skeletons (De Puydt and Lohest, 1886) and it is now thought that there may also have been an Upper Palaeolithic burial overlooked by these early excavators (Dewez 1981,27). It is unfortunate that these early workers neither appreciated nor had the techniques to deal with the difficulties with which this site presented them. For example, De Puydt and Lohest only identified three occupations, whereas they must have cut through at least twice that number. The most recent assessment of this site has been carried out by Dewez (1980,1981). He has suggested that the topmost level contained Upper Palaeolithic remains of a very mixed nature (1981,37-38), including traces of the Creswello-Tjongerian, the Maisierian and the Gravettian. The Magdalenian, or at least the Later Upper Palaeolithic, is doubtless represented by the eyed needles recovered during Twiesselmann's excavations. The second level

contained material from Aurignacian I and II with perhaps some Lincombian, or Earliest Upper Palaeolithic leaf point industry. The third level is thought to have represented no fewer than three successive Mousterian occupations (Dewez 1981,35). It seems that there must have been a prolonged, perhaps even continuous use of this site throughout the later part of the last glaciation and for this reason it is difficult to attribute the vast range of osseous artifacts to particular occupations with any certainty. One particularly interesting feature of this site is that it at one time contained a very productive ivory workshop, which owing to its apparent association with Aurignacian stone artifacts seems likely to have belonged to that period. A small amount of worked ivory has been recovered from most of the major Belgian sites considered here, but no ivory industry of a comparable size has yet been recognised elsewhere in Belgium. A sample from the second level has been radiocarbon dated to (IRPA 203) 25 300 ± 510 years BP (Gilot 1984,119), but there was a risk of contamination from inorganic carbonates contained in the bone, which were probably derived from the surrounding deposit.

Collection:- MRAH - De Loë and Rahir:-

1	antler rod Type (b)	labelled Perigordian
2	Group 3 bone point	" "
3	modified antler	" "
4	Group 4 split-based point	" Aurignacian
5	modified bone	" "

Collection:- Université de Liège:-

6	Group 3 bone point (3667)
7	extracted and modified bone (3667)
8	ivory rod Type (c) (6121)
9	ivory rod Type (c) (6121)
10	ivory rod Type (b) (6121)
11	extracted and modified bone (6121)
12	unfinished ivory bead Type d (6124)
13	ivory bead Type d (6122)
14	perforated tooth
15	incised bone (6125) (Dewez 1960,23)
16	ivory bead Type j (6128)
17	ivory bead Type j (6128)
18	extracted and modified ivory (6123)

Collection:- IRSNB - Twiesselmann (Inventaire Dewez):-

19 Group 4 bone point 132 1954 C18 TII +0.70 à +1.70m partie sup.
20 Group 1 bone point 128 1953 25B 0,20 à 0,40m couche 8
21 Group 4 bone point 125 1952 C13 TAE couche inf.
22 ivory bead Type h 29B
23 ivory bead Type h 29C
24 ivory bead Type h 29A
25 ivory bead Type i 412
26 extracted and modified ivory 33
27 Group 4 ivory point 35L
28 ivory bead Type j 31
29 ivory bead Type j 32
30 ivory bead Type h 1952 12A-E couche inf.
31 perforated bone 18 A'B'C' debl.
32 ivory barbed and tanged arrowhead
33 perforated bone
34 bone with minimal modification
35 incised ivory 140 D'-F' 23 à 19 deblais
36 incised ivory 129 1952 12B couche inf.
37 extracted ivory 11E 12E ZJS
38 bone with minimal modification 1953 6F Z-B 1.15 à 1.25
39 Group 1 bone point 1954 23AI TH 0,30-0,50m
40 Group 3 bone point 1953 7F 1,53 à 1,75m
41 incised bone 1953 7F ZJI 1,15 à 1,43m
42 incised ivory 162 13AE couche inf.
43 modified bone
44 ivory rod Type (c) 257
45 ivory rod Type (c) 265
46 ivory rod Type (c) 267? 3 à 8F debl.sup.
47 incised ivory rod Type (c) 254
48 ivory working débris associated with needle manufacture 267
49 extracted and modified ivory 96
50 extracted and modified ivory 37 1953 11A'-C' couche sup.
51 extracted and modified ivory 7 1953 11A'-C' couche sup.
52 ivory rod Type (b) 18 1952 8II-E couche inf.
53 ivory rod Type (b) 10 1953 17A'-C' couche inf.
54 ivory rod Type (b) 13 1952 11C couche inf.
55 ivory rod Type (b) 29 1953 11A'-C' couche sup.
56 ivory rod Type (c) 272 ZJS 15F
57 extracted and modified ivory 247
58 ivory rod Type (c) 147
59 ivory rod Type (c) 263
60 extracted and modified ivory 219 5.6F ZJI
61 extracted and modified ivory 4 1952 7IIE couche inf.
62 ivory rod Type (b) 24 1952 II eblais
63 incised bone 144 8.9F ZJI
64 ivory bead Type j 86 1953 18/A'-C' couche inf.
65 ivory bead Type j 85 1953 1 à 14/II-E couche inf.
66 ivory bead Type j 107 1952 13-A-E couche inf.
67 extracted and modified ivory 2-3F 0,60 à 0,70 ZJS
68 extracted and modified ivory 2 1953 17 A'-C' couche inf.
69 ivory rod Type (b) 119 13F caillloutis 1,35 à 1,50m
70 incised bone 160 1953 17 A'-C' couche sup.
71 modified ivory 204 1954 24C' TH
72 extracted and modified ivory 233 13F 0 à 0,60 ZN
73 incised bird bone 159 1954 3-4-F 1,80 à 2,20m LC
74 extracted ivory 9BC
75 Group 1 bone point 139 1954 II eblais
76 ivory rod Type (c) 243 19 A'B'C'

77 extracted and modified ivory 266 11 D.E. couche inf.
78 extracted ivory 54 1.2F 0,30 à 0,40
79 extracted and modified ivory 228 1953 12F 1,30 à 1,55
80 modified ivory 229
81 Group 3 bone point 73 1953 11A'-C' couche sup.
82 extracted and modified ivory 24 A'TH
83 extracted and modified ivory 91 1952 5II-E couche inf.
84* extracted and modified bone 146 1953 10A'-C' couche sup.
86 extracted and modified ivory 19AB D inf.
87 incised bird bone 156 1952 17. C-E couche inf.
88 ivory bead Type h 1954 17 II' partie sup.
89 ivory bead Type j 87 1952 11C couche inf. (3)
90 incised ivory 24 sp ?14F ZJM
91 ivory bead Type b 115 1953 16 A'-C' TH
92 ivory rod Type (b) 27 1953 11A'-C' couche sup.
93 ivory rod Type (b) 11 1952 12A'-E couche inf.
94 ivory rod Type (b) 13 1952 8IIE couche inf.
95 ivory rod Type (b) 21 1952 7IIe couche inf.
96 ivory rod Type (b) 10 1953 11 A'-C' couche sup.
97 ivory rod Type (b) 22 1953 12A'-C' couche sup.
98 extracted and modified ivory 17 1952 14 A-E couche inf.
99 ivory rod Type (b) with decorative incisions 13F ZJM 0,90 à 1,20m
100 ivory rod Type (b) 3 1952 7IIE couche inf.
101 ivory rod Type (b) 35 1953 II eblais
102 ivory rod Type (b) 30 1952 12A-E couche inf.
103 ivory rod Type (b) 32 1952 9II-E couche inf.
104 ivory rod Type (c) 253
105 extracted ivory 258
106 extracted and modified ivory 92 1953 II eblais
107 Group 4 point
108 extracted and modified ivory 1950 C50 Coupe V ZB ± remanie R.584
109 extracted and modified ivory 117 12C C.nf.
110 ivory rod Type (c) 232 1953 12F TH
111 incised bone 5F ZJI
112 rib with decorative incisions 11B C.inf.
113 modified bone 3 1952 C11 TA couche inf.
114 modified bone 143 1953 C25 TII 0 à 0,20m Couche 8
115 ivory with incisions 24 C.8 TII 0 à 0,40m
116 extracted and modified ivory
117 perforated bone 1952 C12 TA-E couche inf.
118 extracted and modified ivory 108 1952 C15 TA-E couche inf.
119 extracted and modified ivory 23 I 8
120 extracted and modified bone 106 1953 C18 TA'-C' couche inf.
121 modified bone 149 1954 23 II 0 à 0,20m TN
122 Group 1 bone point 71 1953 22 B-C 0,20 à 0,40m
123 Group 4 bone point 72 1953 18 A'-C' couche sup.
124 extracted and modified ivory 15? 1952 A-E couche inf.
125 perforated tooth 15 A.E. C.inf
126 ivory with decorative incisions
127 Group 4 bone point 111 1954 4-5F' 1,05 à 1,30m ZJS
128 extracted and modified ivory 163 1953 12F 0 à 0,20m TH
129 Group 4 bone point 131 1952 16A-E couche inf.
130 ivory with incisions 225 15A-E C.inf
131 Group 4 bone point 110 1953 II eblais
132 bone with minimal modification 1952 10 A'-C' couche sup.
133 Group 4 point 130 1952 C15 TA-E couche inf.
134 Group 4 bone point 127 1952 C11 TA couche inf.
135 ivory rod Type (b) 118 1952 C13 A-E couche inf.

136 ivory rod Type (b) 120 1952 IRA'-E couche inf.
137 extracted and modified ivory 1953 3 à 8F deblais inf or sup?
138 extracted and modified ivory 207 9.10F ZYS
139 extracted and modified ivory 276
140 ivory rod Type (b) 90 S 6DE couche inf.
141 incised bone 23 à 19 D'E'F' deblais
142 extracted and modified ivory 1952 13 A-E couche inf.
143 modified bone 67 1952 Sp. 20C couche inf.
144 extracted and modified ivory 1953 12F 1 à 1,10m Caill.leger
145 extracted and modified ivory 26 D-E 0 à 0,70 TH
146 extracted and modified ivory 13 A'B'C' Ds
147 Group 3 bone point 126 1953 IIeblais
148 Group 4 bone point 70 1952 17E couche inf.
149 ivory rod Type (b) 15F Debl.
150 Group 1 bone point 150 1953 6F
151 extracted and modified ivory 244
152 ivory rod Type (b) 19A'B'C' Debl. inf
153 extracted and modified bone 155 1953 24B-C 0 à 0,25m
154 Group 4 bone point 1953 15 A'E couche inf.
155 Group 3 bone point 69 1952 12A-E couche inf.
156 Group 4 whittled-based point 96 1953 12A'C' couche inf.
157 extracted and modified ivory 24 B-C 0 à 0,25m
158 ivory rod Type (c) 1953 5F ZJI 1,20 à 1,30
159 extracted and modified ivory 188 7.D.E. couche inf.
160 incised bone 136 9II-E couche inf.
161 ivory rod Type (b) 152 1952 15A-E couche inf.
162 ivory rod Type (b) 164 1952 9D-E couche inf.
163 modified bone 1952 12AE couche inf.
164 extracted and modified ivory 214 1953 1 à 14 D-C
165 bone with decorative incisions 1954 8-9-F 1,25 à 1,45m ZJJ
166 extracted and modified ivory 284 1952 8II-E couche inf.
167 extracted and modified bone 283 1952 17A-E couche inf.
168 bone with incised decoration 281 1953 13A'C'
169 ivory bead Type b 5F 1,3 à IJ caill. leger ser avec passees jaunes
170 modified bone 1952 12A-E couche inf.
171 modified bone 1952 C11 TB couche inf.3
172 modified bone 1954 0-1F 0,45-0,55 Gros cailloutis
173 antler working débris associated with blank extraction 1953 6F 1,45 à 1,70m LC
174 perforated bone
175 ivory working débris associated with blank extraction 1954 25D' 0 à 0,60 TH
176 modified bone 15 ABC' debl. sup
177 perforated phalange 1954 25D' 0 à 0,60 TH
178 extracted and modified ivory 25B' TH 0 à 0,7m
179 ivory bead Type b
180 ivory sphere 1953 3-8F 0 à 0,20 deblais sup JHC
181 extracted and modified ivory 25C TH
182 proximal needle 105 1952 9II-E couche inf.
183 distal needle 105 1952 9II-E couche inf.
184 ivory rod Type (b) 25 1953 16A'-C'
185 segment of incised bird bone 158 1953 17A'-C' couche sup.
186 extracted and modified ivory 148 1953 12A'-C' couche inf.
187 ivory bead Type h 204 1952 11B couche inf.5
188 ivory rod Type (c) 248
189 ivory rod Type (c) 270
190 ivory rod Type (c) 261 16 A'B'C' deblais sup.
191 ivory rod Type (b) 16 1953 6II-E couche inf.

192 ivory rod Type (b) 28 1953 17A'-C' couche inf.
193 extracted and modified ivory deblais
194 ivory rod Type (b) 80 1953 10A'-C' couche sup.
195 extracted and modified ivory 230 13F 0,90-1,20 ZJN
196 ivory rod Type (c) 256
197 extracted and modified ivory 268 0.1F
198 extracted and modified ivory 239 12F Lit de G111
199 ivory rod Type (b) 34 1952 11-C couche inf.
200 incised, extracted and modified ivory 226
201 ivory bead Type j 68 1954 23B 0 à 0,50m TN
202 ivory rod Type (b) 38 1952 11B couche inf.
203 ivory rod Type (c) 269
204 ivory bead Type g 1953 18 A'-C' couche sup.
205 ivory bead Type c 200 1952 8IIE couche inf.
206 extracted and modified ivory 216 1954 0,90 à 0,95 Ligne jaune
207 ivory rod Type (b) 23C' 0 à 0,60
208 extracted and modified ivory 271
209 ivory bead Type e 88 1952 12-C couche inf. 3+4
210 ivory bead Type b 63 1953 1 à 1h\II-E couche inf.
211 Group 3 bone point with incised decoration 95 1954 19II' +0,70 à 1,70m partie sup.
212 extracted and modified bone 238 26IIE TH
213 ivory bead Type f 154 1953 14A'-C' couche sup.
214 modified bone 224 15A-E couche inf.
215 ivory bead Type b 62 1953 12 A'-C' couche sup.
216 extracted and and modified ivory 25A 0 à 0,60 TH
217 ivory bead blank Type b 47 1952 8 II-E couche inf.
218 ivory bead Type f 1953 18 B.C. 0,90 à 1m
219 extracted and modified ivory 18A'B'C' deblais inf.
220 ivory rod Type (c) 262 21II
221 ivory rod Type (c) 249 17 ABC'
222 ivory rod Type (c) 260
223 incised bone 1953 18 A'-C' couche inf.
224 ivory bead Type e 1952 C12 TB couche inf. 3
225 ivory bead Type d 11 A'C' couche sup.
226 perforated bone 12A'C' couche sup.
227 extracted and modified ivory 251
228 modified ivory 22 C8III
229 incised bone C25 DE TH 6 à 0,60
230 ivory bead Type b 114 1952 10 II-E couche inf.
231 incised bird bone 157 1952 12 A-E couche inf.
232*extracted and modified ivory 147 II eblais
234 extracted and modified ivory 273 5F ZJM
235 extracted and modified ivory 259 23BC
236 modified ivory 275
237 ivory bead blank Type b 55 1952 12A-E couche inf.
238 ivory bead blank Type b 49 1952 12B couche sup. 2
239 ivory bead Type c 203 1953 17/A'-C' couche sup.
240 ivory bead Type h 199 1952 12A couche inf.
241 ivory bead Type h 198 1954 0-1F 0,55 à 0,65m ZJS
242 extracted and modified ivory 1953 12A'B'C' deblais inf.
243 ivory rod Type (b) 36 1953 16A'-C' couche sup.
244 extracted and modified ivory F 0,55 à 0,65m ZJS
245 perforated bone 16 A'-C' couche sup.
246 bone with grouped incisions 94 1953 11A'-C' couche sup.
247 incised ivory 161 13AE couche inf.
248 ivory bead blank Type b 48 1952 6II-E couche inf.
249 extracted and modified ivory 68

250 ivory bead blank Type b 26 1952 7II-E couche inf.
251 ivory rod Type (c) 252
252 ivory rod Type (c) 19
253 extracted and modified ivory 5 1952 12A-E couche inf.
254 ivory rod Type (b) 20 1953 II eblais
255 extracted and modified ivory 33 1953 14 A'-C' couche inf.
256 ivory rod Type (b) 15 1953 10A'-C' couche sup.
257 modified ivory 165 1952 11C couche inf.
258 extracted and modified 9 1953 17 A'-C' couche sup.
259 ivory bead Type c 201 1953 6II-E couche inf.
260 ivory rod Type (b) 23 1952 10 II-E couche inf.
261 ivory bead Type b 76 1952 12-C couche inf. 3+4
262 ivory working débris associated with needle manufacture 255
263 tooth with start of perforation 8 D.E couche inf.
264 tooth with start of perforation 227 1952 9II-E couche inf.
265 extracted and modified ivory 12 18 A'-C' couche sup.
266 extracted and modified ivory 274
267 ivory bead Type b 79 1953 18/A'-C' couche inf.
268 ivory bead Type b 81 1953 10 A'-C' couche sup.
269 ivory sphere 18 1953 18 A'-C' couche inf.
270 ivory sphere 1952 6 IIE couche inf.
271 ivory sphere 1953 11/A'-C' couche sup.
272 ivory sphere 1952 10IIE couche inf.
273 ivory sphere 1953 17A'-C' couche inf.
274 ivory bead blank Type b 45 10 II-E couche inf.
275 ivory bead blank Type b 42 1954 IIE couche inf.
276 ivory bead blank Type b 41 1952 12A'-E'
277 ivory bead blank Type b 231
278 ivory bead blank Type b 74 1953 11/A'-C' couche inf.
279 ivory bead blank Type b 57 1954 10-11-F 1 à 10m caill. légèr roulé
280 ivory bead blank Type b 50 1952 7IIE couche inf.
281 ivory bead blank Type b 39 1952 6IIE couche inf.
282 ivory bead blank Type b 46 1953 16A'-C' couche sup.
283 ivory bead blank Type b 54 1953 11/A'-C' couche sup.
284 ivory bead blank Type b 116 1953 17/A'-C' couche sup.
285 ivory bead blank Type b 53 1952 10IIE couche inf.
286 ivory bead blank Type b 52 1952 8IIE couche inf.
287 ivory bead blank Type b 43 1954 - 1 à-2F' 0,30 à 0,40m
288 ivory bead blank Type b 40 1953 18/A'-C' couche sup.
289 ivory bead blank Type b 44 1953 23B-C 0,40 à 0,50m
290 ivory bead blank Type b 80 1952 8IIE couche inf.
291 ivory bead Type b 82 1953 23C' 0 à 0,60m
292 ivory bead Type b 56 1952 10 II-E couche inf.
*Numbers 85 and 233 were removed from the list, as they did not show sufficient traces of modification, and so were added to working débris

"Working Débris": MRAH: modified antler 1
: Université de Liège: modified bone 3
: IRSNB: extracted pieces with no further modification 15
modified bone 50
modified antler 5
modified ivory 89
extracted and modified bone 5
extracted and modified ivory 52
burnt osseous fragments, some possibly worked 137

Site Number 7
Grotte de la Princesse, Marche-les-Dames, Province de Namur
Excavations:- Rahir 1920
Colette 1923-1931
Angelroth 1929 excavations in old spoilheap
Otte 1976
Publications:- De Loë 1922
Rahir 1931
Angelroth 1933
de Sonneville-Bordes 1961
Otte 1974a, 1979

Description:- This site contained one archaeological level (see De Loë, Rahir), which has generally been attributed to the Aurignacian (de Sonneville-Bordes 1961,429), although Otte (1974a,212) has identified minor traces of the Upper Perigordian. It is probable that the artifacts listed below come from the Aurignacian occupation. Two very inconsistent radiocarbon dates have been obtained from animal bone splinters from the site. The first date of (IRPA-201) 23 460 ± 500 years BP (Gilot 1984,119) was from a sample of bone from Rahir's excavations, which contained inorganic carbonates, probably derived from the surrounding deposit, and thus there was risk of contamination. The second date (Lv-1238) 11 840 ± 100 years BP was derived from collagen in a bone sample recovered by Otte during his excavations. Gilot's assessment is that the difference between the two dates is too great to be explained by a possible contamination and that the two samples do not belong to the same epoch.

It appears that the Colette collection in the Institute of Natural Sciences may not be entirely reliable, but I think that it is worth including in this study owing to the close resemblance of two of the artifacts in particular (Numbers 3 and 5) to other Belgian Upper Palaeolithic bone artifacts. There is also a collection of twenty-eight worked fragments, mainly of ivory, from this site in the Musées Royaux d'Art et d'Histoire: this latter material is in a very poor condition, so it is not listed here.

Collection:- IRSNB - Colette:-
1 Group 1 bone point
2 Group 4 bone point
3 incised bone pendant
4 Group 4 bone point
5 incised ivory ring

"Working Débris": modified bone 3
modified ivory 1

Site Number 8
Grottes de Goyet, commune Mozet, Province de Namur
Excavations:- Dupont 1868-1869
Tihon 1891, sondages on the terrace
Cinquantenaire 1907,1909
Hamal-Nandrin 1914
Le Grand Metz 1914-1920
caves visited by Angelroth, Beaulieu, Colette, Eloi and various amateurs 1920-1935
Kayser 1936
IRSNB 1937-1938
Publications:- Dupont 1869,1872
Tihon 1895-1896
Angelroth 1937,1938,1955
Debaille 1944-1945
Cuvelier 1947
Dierick 1958
Otte 1979

Description:- These caves are part of a network of caves and galleries on the right bank of the Samson, 10km south-east of Namur. One cave in particular is of great interest, as it has yielded a very rich collection of Upper Palaeolithic artifacts, including a biserial barbed point and two perforated bâtons. This cave was designated No.3 by Dupont, but has rather confusingly been referred to as Cave No.4 by some later writers (see Angelroth 1937,8). In this cave, Dupont identified five archaeological and palaeontological levels with sterile layers in between. The lower two levels showed no human remains and probably date from when the cave was an animal den. However, the upper three levels contained some Middle and abundant Upper Palaeolithic material, which unfortunately has become mixed. The artifacts indicate the presence of Mousterian, Aurignacian, Upper Perigordian and Magdalenian occupations within the three levels

identified by Dupont. In the absence of absolute dates and of reliable stratigraphic observations, the stone and bone artifacts have to be attributed to the various cultures on the basis of typology alone, which is not very satisfactory, and in any case leaves areas of overlap.

Collection:- MRAH - Hamal-Nandrin:-

1 perforated tooth (No.4268) }
2 ivory bead Type a (No.4269) } Found in old spoilheaps in 1914
3 Group 4 point (No.4271) } (Dierick 1958,80)
4 Group 1 bone point (No.4272) }
5 extracted antler (No.4273) }
6 rib with incised decoration (No.15065) Found in 1934 in old spoilheaps (Dierick 1958,80)

Collection:- MRAH - museum excavations:-

7 Group 4 spindle-shaped point labelled Magdalenian
8 needle blank " "
9 extracted and modified bone " Aurignacian
10 Group 3 bone point " "
11 modified bone " "
12 extracted and modified bone " Perigordian
13 Group 4 spindle-shaped point " "
14 extracted and modified bone (No.15066)
15 bone with decorative, curvilinear incisions
16 incised antler (No.1424)
17 wedge-shaped segment
18 antler rod Type (a)
19 sawn-off segment of antler rod Type (a)

Collection:-Université de Liège:- Hamal-Nandrin's collection?:-

20 pointed ivory rod Type (b) with incised decoration (.1258)
21 Group 4 point (.1249) (897)
22 pointed ivory rod Type (b)
23 modified bone (.1250)
24 wedge-shaped segment (.1262?)
25 incised bird bone (.6126)

Collection:- IRSNB - Achat Kayser (Industrie Aurignacien)

26 Group 3 bone point (.11425)

Collection:- IRSNB - museum excataions - Mousterien,Aurignacien

27 extracted and modified antler (.11426) Gall Annexe Niv.2
28 extracted and modified antler (.11426)
29 bone segment with polish 2751 17 3eCav 2eNiv
30 modified ivory 2752.7 3eCav 2eNiv
31 modified ivory 2752.11 3eCav 2eNiv
32 modified ivory 2752.9 3eCav 2eNiv
33 Group 4 lozenge shaped point
34 antler bead Type 1 G1 .11735
35 bone segment with polish .11735

Collection:- IRSNB - Aurignacien Sup 3eCav 2eNiv

36 Group 1 bone point .2751.2849.34
37 Group 1 bone point .2849.4

38 antler rod Type (a) .2849.1
39 pointed antler rod Type (a) .2751.46
40 pointed antler rod Type (a) .2849.6
41 antler rod Type (a) .2849.5
42 antler rod Type (b) .2751?47
43 antler rod Type (a) .2751.41
44 Group 1 bone point .2751.22
45 antler rod Type (a) .2751.48
46 sawn off segment of antler rod Type (a) .2849
47 antler rod Type (a) .2751.5
48 Group 3 bone point .2751.24
49 extracted and modified bone .2752? 3
50 pointed antler rod Type (a) .2751.51
51 pointed antler rod Type (a) .2751.50
52 antler rod Type (b) .2751.6
53 Group 4 point .2751.10
54 bone segment with polish .2751.2638.1
55 Group 1 bone point .2751.27
56 antler working débris associated with needle manufacture .2751.2
57 modified bone .2849.7
58 extracted and modified antler .2751.4
59 bone segment with polish .2751.15
60 bone segment with polish .2751.14
61 bone segment with polish .2751.18
62 bone segment with polish .2698.2
63 bone segment with polish .2751.20
64 bone segment with polish ?19
65 incised and perforated Group 4 bone point .9898.1404
66 Group 3(i) bone point .2751.37
67 Group 4 bone point .2751.38
68 Group 1 bone point .2751.35
69 Group 3 bone point .2751.28
70 Group 3 bone point .2751.49
71 Group 4 bone point .2751.33
72 pointed antler rod Type (a) .2751.2849 8A
73 Group 3 bone point .2751.36
74 Group 1 bone point .2751.32
75 Group 1 bone point .2750.1
76 Group 3 bone point .2849.3
77 Group 3(i) bone point .2752.3?
78 Group 1 bone point .2751.26
79 Group 4 point .2751.30
80 Group 4 bone point .2751.29
81 Group 4 bone point .2849 4A
82 Group 1 bone point .2751 4696.39
83 modified ivory .2751.8
84 modified bone

Collection:- IRSNB - Fouilles du Musée Aurignacien Salle du Mouton:-
85 bone segment with polish .11735
86 extracted and modified bone
87 extracted and modified antler
88 Group 4 lozenge shaped point
89 extracted and modified ivory 11735
90 modified bone
91 extracted bone
92 extracted and modified bone
93 Group 1 bone point

94 Group 1 bone point IG 11426
95 Group 3(i) bone point IG M11735
96 perforated tooth Canis vulpes
97 perforated tooth Canis vulpes
98 perforated tooth Canis vulpes
99 bone segment with polish
100 bone segment with polish
101 bone segment with polish
102 extracted antler
103 extracted and modified antler
104 modified bone
105 pointed antler rod Type (a) .2749.77
106 Group 4 split-based point 11735
107 bone segment with polish
108 Group 4 bone point
fossil shell with no traces of perforation

Collection:- IRSNB - Dupont:-
109 biserial barbed point
110 perforated antler bâton .2751.141
111 decorated, perforated antler bâton Niv2

Collection:- IRSNB - From display:-
112 ivory bead Type b 2eNiv.2751
113 ivory bead Type b
114 ivory bead Type b
115 ivory bead Type b
116 ivory bead Type b
117 ivory bead Type b
118 fragment of ivory bead Type b
119 ivory bead Type j
120 ivory bead Type h 2eNiv
121 perforated tooth 2eNiv .2751
122 ivory bead blank 2eNiv .2751.57
123 pointed antler rod Type (a) 1eNiv .2751.127
124 bird bone with grouped incisions .2751.114
125 rib with incised decoration .2751.116
126 perforated, longitudinally-split phalange IN 2751 122?
127 double perforated phalange "whistle" 1eNiv 2751 119
128 bone bead Type a 1eNiv 2751 118
129 ivory bead Type a 122
130 ivory bead Type a 2751 121
131 bone with grouped incisions 1eNiv 2751 115
132 bone "whistle" 2e Niv 2750 4 (Dupont 1872,115)
133 Group 4 point 1eNiv 2751 132
134 Group 4 point 1eNiv 2751 135
135 bone segment with polish 1eNiv 2698 17
136 pointed antler rod Type (a) 1eNiv 2698 7
137 pointed antler rod Type (a) 1eNiv 2751 129
138 Group 4 antler point 2eNiv 2751 134
139 extracted and modified antler 1eNiv 2751 137
140 Group 4 whittled-based point 1eNiv 2698
141 extracted and modified antler 2749 75
142 Group 4 point 1eNiv 2698.10
143 Group 4 antler point 1eNiv 2696.5
144 unfinished Group 4 antler point 3eniv 2749.69
145 Group 4 antler point 1eniv 2698.8
146 antler rod Type (a) 1eniv 2698.5

147 bone segment with polish 1eniv 2751 145A
148 Group 4 point 1eniv ?2751
149 extracted and modified bone 1eniv 2698 8?
150 bone segment with polish 1eniv 2698 15
151 Group 4 antler point 1eniv 2751 158?
152 bone segment with polish 1eniv 2751 146
153 bone segment with polish 1eniv 2698 16
154 incised bone segment with polish 1eniv? 2751 145
155 antler rod Type (a) 1eniv 2698.6
156 ivory working débris associated with needle manufacture 3eniv 2749 70
157 ivory rod Type (c) 1eniv 2697 13
158 ivory rod Type (b) 1eniv 2751 140
159 pointed ivory rod Type (b) 1eniv 2751 139
160 antler rod Type (a) 2751 44
161 pointed ivory rod Type (b) 2751 138
162 Group 1 bone point 2eniv 2751.186
163 antler rod Type (a) 1eniv 2693.9
164 extracted antler 1eniv 2751 130
165 bone working débris associated with needle manufacture 1eniv 2751 147
166 bone working débris associated with needle manufacture 2751 148?
167 antler rod Type (b) 2eniv 2750 5
168 bone working débris associated with needle manufacture 1eniv 2751 143
169 Group 3 bone point 2696
170 bone needle
171 needle blank 2751
172 needle blank 2696
173 needle blank 2896
174 needle blank 2696
175 needle blank
176 proximal needle 2696
177 needle blank 2696
178 needle 2696
179 distal needle
180 distal needle 2696
181 distal needle
182 distal needle 2696
183 proximal needle 2696
184 needle blank 2696
185 needle blank 2696
186 needle blank 296
187 needle blank
188 needle blank

"Working Débris": Université de Liège: modified bone 1
:IRSNB - mainly from museum excavations:
extracted pieces with no further modification 103
modified bone 227
modified antler 3
modified ivory 1
extracted and modified bone 23
extracted and modified antler 2
extracted and modified ivory 18
bone with minimal modification 63
working débris associated with blank extraction 3
burnt osseous fragments, some possibly worked 60

Site Number 9
Trou des Nutons, Verlaine, Commune de Tohogne, Province de Luxembourg
Excavations:- Destinez and Moreels 1887-1888
Lequeux C20
Dewez 1970's
Publications:- Destinez and Moreels 1887-1888,1887-1888a,1888
Doize 1958,1960

Description:- This cave contained one Upper Magdalenian level, which was sealed by a stalagmite layer, above which Gallo-Roman remains were found. The Magdalenian occupation has been radiocarbon dated to (Lv 690) 13 780 ± 220 years BP from bone splinters collected by the original excavators of the site (Gilot 1984,120). This cave has yielded some bone artifacts which are typical of the Belgian Magdalenian, such as needles and barbed points, as well as some quite unusual items; so far as we are aware, all come from the same level, but it is most regrettable that the information about this cave is so unsatisfactory. No full account was ever published by Destinez and Moreels, only three very brief, preliminary reports, which contain neither plans, nor sections. It also seems that the collection made by Lequeux, which is held in the Cinquantenaire, is likely to be fairly unreliable (Doize 1960,31). Furthermore, the Trou des Nutons, which is situated on the left bank of the Ourthe, has frequently been confused with the Grotte de Sy, which is on the other side of the river and which has also yielded archaeological remains, though it is not clear of what age. In this study, this site is called Verlaine, while that named Trou des Nutons is Site Number 2 at Furfooz.

Collection:- MRAH - Lequeux:-
1 unfinished, biserial barbed point
2 needle
3 needle
4 Group 4 point
5 Group 3 point
6 needle shaft
7 needle shaft
8 modified bone
9 modified bone
10 incised bone

11 incised bone
12 incised bone
13 incised "whistle"
14 incised bone
15 incised bone
16 incised bone
17 incised bone
18 incised bone
19 incised bone
20 incised bone
21 incised bone
22 incised bone
23 incised bone
24 incised bone
25 incised bone
26 incised ivory
27 incised bone
28 incised bone
29 bone with decorative, curvilinear incisions
30 incised bird bone
31 incised bone
32 incised bone
33 incised bone
34 modified bone
35 incised bone
36 incised bone
3 perforated shells

Collection:- Université de Liège - Destinez and Moreels:-
37 antler rod Type (a) 1518 (1104?)
38 pointed antler rod Type (a) 1514 (11050)
39 antler rod Type (a) 1517 (11048)
40 antler rod Type (a) 1320 (11051)
41 incised bone 1539
42 Group 3 bone point 1542
43 Group 3 bone point 1551?
44 modified bone 1555
45 antler rod Type (a) TH58
46 modified bone
47 modified bone 5502
48 extracted and modified antler 1556
49 fish pendant 535
50 bone pin with human head 1535
51 extracted antler
52 extracted and modified bone

"Working Débris": modified bone 1
modified antler 2

Site Number 10
La Grotte du Coléoptère, Bomal-sur-Ourthe, Province de Luxembourg
Excavations:- Hamal-Nandrin and Servais 1923-1924
Dewez 1972-1978
Publications:- Hamal-Nandrin and Servais 1925
Dewez 1975
Marien 1981

Description:- There is an Upper Magdalenian layer attributed to the Dryas II stage and radiocarbon dated to (Lv 717) 12 400 ± 110 years BP and (Lv 686) 12 150 ± 150 years BP (Gilot 1984,120), the samples being taken from a reindeer bone and an indeterminate bone splinter respectively. Above this, Dewez has identified an Ahrensburgian assemblage belonging to Dryas III. This cave is situated 190m from the Aisne, which is a tributary of the Ourthe. The site has yielded a very interesting assemblage of Magdalenian artifacts, including the 'coléoptère' itself (Number 14), as well as five finished barbed points and one unfinished example. This exceeds the total number of barbed points from all the other Belgian Upper Palaeolithic sites. In the following list, the attributions of individual pieces are indicated where known.

Collection:- MRAH - Hamal-Nandrin and Servais:-
From Layer B, thus Magdalenian
1 needle (1925,6)
2 needle (1925.6)
3 needle (1925,6)
4 distal needle presumed to be from Layer B
5 needle shaft presumed to be from Layer B
6 needle shaft presumed to be from Layer B
7 distal needle (No.13012) presumed to be from Layer B
8 uniserial barbed point (1925,6)
9 uniserial barbed point (1925,6)
10 uniserial barbed point (1925,6)
11 uniserial barbed point (1925,6)
12 unfinished, uniserial barbed point presumed to be from Layer B
13 extracted and modified bone (1925,6)
14 ivory pendant shaped like a beetle (1925,6)
15 double perforated object (1925,6)
5 perforated fossil shells (1925,7)
From Layer A', thus Ahrensburgian
16 wedge-shaped segment (No.12875) (1925,5)
28 perforated tooth Canis vulpes lagopus (1925,5)
Artifacts presumed to be from Layer B (thus Magdalenian)
17 bone pendant (No.30-10-53 48)
18 bone working débris associated with needle manufacture
19 bone working débris associated with blank extraction
20 modified bone
21 Group 1 bone point with grouped incisions
22 Group 3 bone point
23 incised bone
24 incised bone
25 bone working débris associated with needle manufacture

Collection:- Université de Liège - Dewez:-

Magdalenian
26 uniserial barbed point (1975,129-132)
27 needle

"Working Débris": extracted pieces with no further modification >300
modified bone >150
modified antler 1
extracted and modified bone 1
working débris associated with blank extraction 21

Site Number 11
La Grotte de Remouchamps, commune Sougne-Remouchamps, near Spa, Province de Liège
Excavations:- Schmerling c1830-1833 trial trench
Van Breda c1832
Van Den Broeck 1898 trial trench
Rahir 1902
Dewez 1969-1970
Publications:- Van Den Broeck 1898-1899
Rahir 1920
Dewez 1973-74,1974

Description:- Only one occupation level has been found on this site and it has been attributed to the Ahrensburgian. A radiocarbon date of (Lv 535) 10 380 ± 170 years BP (Gilot 1984,121) has been obtained from a bone fragment found during the excavations carried out by Dewez. This cave site, which is situated c50 metres from the right bank of the Amblève has yielded a small, but most interesting bone industry, and we can feel confident that the items belong together as part of the Ahrensburgian industry.

Collection:- MRAH - Rahir:-
1 bone decorated with a quincunx pattern (Rahir 1920,47-50)
2 incised bone
3 modified antler
4 Group 4 bone point (Rahir 1920,47.No.2)
40 perforated shells, interpreted as a necklace (Rahir 1920,51/52)
Collection:- Université de Liège - Dewez:-
5 bone decorated with grouped incisions (Dewez 1973-74,82-92;1974)

Site Number 12
Grottes de Fond-de-Forêt or Bay-Bonnet, commune de Forêt, Province de Liège
Excavations:- Schmerling c1830, mainly in the second cave
Tihon 1895
Hamal-Nandrin 1905-1914
Exsteens 1907
Rutot 1907
Lequeux 1916

Hamal-Nandrin, Servais and Louis 1931-1933

Publications:- Exsteens 1907
Hamal-Nandrin 1908
Rutot 1910
Hamal-Nandrin, Servais and Louis 1934
Danthine 1952?
de Sonneville-Bordes 1961
Dewez 1979a
Otte 1979

Description:- There is some variation in the spelling of the name of this site in that it also sometimes appears as Fonds de Forêt or Fonds-de-Forêt, I have adopted the form Fond-de-Forêt, as it appears to be the one most commonly used. These two caves are situated approximately 8m from each other on the left bank of the Soumagne, which is a tributary of the Vesdre. The first cave has proved to be the more productive and I believe that all the artifacts listed here come from that cave. Its stratigraphy is very confusing, but a study of the literature suggests that there was a Mousterian layer and then an Aurignacian level, with some Upper Perigordian also present (Otte 1979,518). It is generally agreed that two phases of the Later Upper Palaeolithic were also represented at the site, one of which was the Ahrensburgian. However, Otte (1979,518) and de Sonneville-Bordes (1961,429) among others, attribute the other Later Upper Palaeolithic occupation to the Magdalenian, whereas, Dewez (1986,120) believes that the non-Ahrensburgian remains belong instead to the Creswello-Tjongerian. It is to this last occupation that Dewez (1979a,121-122) suggests the large ivory rod and the antler rod found by Schmerling belong, although it seems fair to observe that such antler rods are very much a feature of the Belgian Magdalenian (see Chaleux). The attribution of the other finds from this site is uncertain, and is discussed in the text.

Collection:- MRAH - Hamal-Nandrin:-
1 large bone pendant found in an upper layer in 1905
2 pointed antler rod Type (a)
3 antler rod Type (a) (No.5177)

4 Group 4 antler point
5 Group 4 point
6 Group 4 point (No.5181)
7 Group 3 bone point
8 sawn off antler (No.4313)
9 bone with minimal modification (No.5175)
10 Group 3 bone point
11 modified bone (No.4312)
12 incised bone
13 modified ivory (5174)
14 bone with minimal modification
15 bone with minimal modification

Collection:- Université de Liège - Schmerling:-
16 large ivory rod Type (a)

Site Number 13
Maisières Canal, Maisières, Province de Hainaut
Excavations:- Bois d'Enghien 1966
de Heinzelin 1966
de Heinzelin and Haesaerts 1967-1973
Publications:- de Heinzelin 1971,1973,1973a
Haesaerts and de Heinzelin 1979
Otte 1979
Campbell 1980,1986

Description:- A single, homogeneous, lithic industry was found on this site which includes Perigordian artifacts, as well as a wide range of tanged points and unifacial leaf points. These unusual characteristics have led de Heinzelin (1971,74) to name this industry the "Perigordien hennuyer", while Campbell has recognised it as the type assemblage for a particular Earlier Upper Palaeolithic leaf point and tanged point tradition, which he has recognised in Northern Europe, the "Maisierian". Similar tanged points have been found at Spy, Goyet and Trou Magrite. Unfortunately, the radiocarbon dates obtained for this site by Gilot (1984,120) are inconsistent and as such should be rejected. Dewez (1985,121) has suggested that the Maisièrien may instead be dated by the radiocarbon date obtained for the open site of Station de l'Hermitage, Huccorgne, of (GrN 9234) 23 170 ± 160 years BP, where a similar industry was found.

The Maisières Canal site differs from the other Belgian sites considered here, in that it was discovered relatively recently and was excavated by the Institute of Natural Sciences using modern, scientific techniques. Furthermore, it is an open site "originally situated on the northern bank of the pleistocene river, on the spur of a small tributary" (Haesaerts and de Heinzelin 1979,91), but was found lying no fewer than six metres underneath the alluvial flood-plain of the river Haine. The osseous industry is remarkably well preserved and includes an interesting range of bone, antler and in particular ivory artifacts, for which the closest comparisons seem to lie in Eastern Europe (de Heinzelin 1971,1973; Haesaerts and de Heinzelin 1979).

Collection:- IRSNB - Bois d'Enghien

1	rib bone with minimal modification	
2	Group 4 ivory whittled-based point	(BDE-0-6)
3	extracted and modified ivory	(BDE-0-7)
4	incised, oval-headed ivory pin	(BDE-0-1)
5	extracted and modified ivory	
6	Group 3 ivory point	
7	worked ivory (container?)	(BDE-0-2)
8	ivory with incised lozenge pattern	(BDE-0-5)
9	incised, sawn bone tube	(BDE-0-3)
10	modified ivory	
11	half-cylinder of incised bird bone	(BDE-0-4)

Collection:- IRSNB:-

12	large rib segment with minimal modification	(IR-0-43)
13	rib segment with minimal modification	(IR-0-46)
14	incised rib segment	(IR-0-45)
15	modified rib segment	(IR-0-47)
16	rib segment with minimal modification	(IR-0-42)
17	thick bone splinter with minimal modification	(IR-0-39)
18	burnt bone fragment with minimal modification	(IR-0-40)
19	burnt rib fragment with minimal modification	(IR-0-41)
20	modified rib	(IR-0-44)
21	large rib segment with minimal modification	(IR-0-48)
22	ivory with incised lozenge pattern	(IR-0-49)
23	ivory with incised lozenge pattern	(IR-0-51)
24	ivory with incised lozenge pattern	(IR-0-50)
25	ivory working débris associated with 'needle' manufacture	(IR-0-55)
26	notched antler	(IR-0-35)
27	incised bone	(IR-0-34)
28	bone with decorative, curvilinear incisions	(IR-0-36)
29	incised bone	(IR-0-37)
30	modified bone	(IR-0-16)
31	worked ivory (container?)	(IR-0-14)
32	Group 4 spindle-shaped point	(IR-0-13)

33	Group 4 ivory whittled-based point	(IR-0-15)
34	unmodified antler tip	(IR-0-32)
35	modified antler tip	(IR-0-31)
36	unmodified antler tip	(IR-0-33)
37	ivory with incised lozenge pattern	(IR-0-57)
38	modified ivory	(IR-0-18)
39	extracted ivory	(IR-0-52)
40	extracted and modified ivory	(IR-0-52)
41	extracted and modified ivory	(IR-0-53)
42	extracted and modified ivory	(IR-0-59)
43	large lump of bone (labelled "percuteur")	(IR-0-38)
44	perforated phalange "whistle"	(IR-0-11)
45	broken phalange "whistle"	(IR-0-12)
46	incised ivory	(IR-0-60)
47	extracted and modified ivory	(IR-0-62)
48	extracted and modified ivory	(IR-0-61)
49	extracted and modified ivory	(IR-0-22)
50	extracted ivory	(IR-0-24)
51	extracted and modified ivory	(IR-0-23)
52	extracted and modified ivory	(IR-0-19)
53	extracted and modified ivory	(IR-0-21)
54	extracted and modified bone	(IR-0-20)
55	extracted antler	(IR-0-28)
56	bone with minimal modification	(IR-0-29)
57	modified bone	(IR-0-30)
58	extracted and modified ivory	(IR-0-17)
59	extracted and modified ivory	(IR-0-54)
60	ivory rod Type (c)	(IR-0-58)
61	ivory rod Type (a)	(IR-0-27)
62	unmodified antler tip	(IR-0-25)
63	extracted and modified bone	(IR-0-26)
64	incised bird bone	(IR-0-56)

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Appendix 2

Tool Types and Definitions

Group 1 Points:- artifacts made from bones which have been split longitudinally by sawing, and worked to a point at one end after the removal of that articular end. The remaining articular end provides a convenient handle (see fig.4:1).

Group 2 Points:- artifacts made from bones which have been either broken or sawn across the shaft, and then worked to a point. The remaining articular end provides a convenient handle (see fig.4:3).

Group 3 Points:- artifacts made from splinters of bone, antler or ivory which have been worked to a point at one end. Either no débitage was involved, or else it was restricted to the production of the tip (Subgroup 3(i)) (see fig.4:4).

Group 4 Points:- bone, antler or ivory artifacts which have been deliberately extracted and then further modified to produce a distal point (see fig.4:5). They include the following subgroups:-

(i) Split-based Points:- bone or antler artifacts which are pointed at one end and split perpendicular to the long axis at the other end. One example is lozenge-shaped, while the rest are roughly triangular. They are either oval or plano-convex in section (see fig.4:6).

(ii) Spindle-shaped Points:- bone, antler or ivory artifacts which are either oval or circular in section; they are thickest in the middle and taper to both ends, though they are not necessarily pointed at both ends (see fig.4:8).

(iii) Whittled-based Points:- bone, antler or ivory artifacts with a distal point and a whittled base (see fig.4:10).

(iv) Lozenge-shaped Points:- large, roughly lozenge-shaped points made of antler, which are curved in section (see fig.4:11).

Antler Rods:- artifacts made from narrow, worked reindeer antler shafts, which may be pointed at one end and double-bevelled at the other, although in many cases neither feature survives. These pieces are either circular or subrectangular in section (see figs. 4:12 and 4:14).

Ivory Rods:- artifacts made from narrow, worked ivory shafts, which may be pointed at one end and double-bevelled at the other, although in most cases neither feature survives. These pieces may be square, circular or semi-circular in section (see fig.4:18).

Barbed Points:- bone or antler artifacts, worked to a distal point, with a series of barbs on one (uniserial) or both (biserial) edges (see figs. 4:21 and 4:22).

Needles:- bone, antler or ivory artifacts shaped like modern, metal needles, with a pointed distal end and a perforated proximal end (see fig.5:1).

Pins:- bone, antler or ivory artifacts with a narrow, roughly cylindrical shaft, which are worked to a point at the distal end, with a swelling at the proximal end (see fig.5:3).

Bone Segments with Polish:- polished pieces of rib bone with rounded or square ends, which are generally curved in profile (see fig.5:4).

Wedge-shaped Segments:- artifacts made of bone, antler or ivory, though more usually antler, which are tongue-shaped in outline and semi-circular in section. The narrower distal end is either single or double bevelled (see fig.5:5).

Perforated Bâtons:- objects made from the beam of an antler, that is the main shaft, with a large perforation at the wider end, where at least one tine joins the beam. These artifacts have often received some form of incised decoration (see fig.5:7).

"Whistles":- perforated pieces of bone, which may have been designed to be used as whistles (see fig.5:8).

Spatulae:- bone artifacts of a dagger-like shape, with a broad proximal end, which could serve as a handle and a narrow, sometimes bevelled distal end with a number of regular protuberances on each side of the shaft (see fig.5:9).

Beads:- small, deliberately shaped and perforated pieces of bone, antler and particularly ivory, which are believed to have been decorative and designed to be worn. Twelve different types of beads have been identified:-

a oval, b double-bevelled, c circular, d oblong, e double-perforated, f pear-shaped, g scalloped, h irregular-shaped, i tooth-shaped, j 'figure of 8-shaped', k 'B-shaped', l antler bead (see figs. 6:1 to 6:3).

Pendants:- large, deliberately shaped and perforated pieces of bone or ivory, which were probably worn as ornaments (see fig.6:4).

Perforated Ivory Discs:- subcircular, very thin pieces of worked ivory, which have a roughly central perforation (see fig.6:7).

Ivory Rings :- large rings made of ivory, which vary in section. One example has received some incised decoration (see fig.6:8).

Perforated Teeth:- teeth which have been perforated through the root either for suspension or for trimming garments. Some examples bear decorative incisions (see fig.6:9).

Perforated Shells:- shells which have been perforated either for suspension or for trimming garments (see Plate 6:3).

Incised Pieces:- artifacts and naturally produced splinters of bone, antler or ivory with incised decoration, which ranges from carefully patterned incisions, which could have some numerical significance to deliberate, but not organised incisions (see figs. 6:10 to 6:17).

Representational Art:- pieces of bone, antler or ivory, which have either been engraved with or sculpted into the representation of an animal or a human figure (see figs. 6:18 and 6:19).

Appendix 3

Lists of Implements

Group 1 Bone Points:	Ogof Garreg Hir 1
	Robin Hood's 1
	Kent's 8,9
	Torbryan 1,2
	Pin Hole 10
	Goyet 4,36,37,44,55,68,74,75,78,82,93,94,162
	Magrite 26,29,31,38,57
	Spy 20,39,75,122,150
	Grotte de la Princesse 1
	Nutons 6
	Coléoptère 21
Group 2 Bone Points:	Gough's 1,2,3,4,5
	Church 6,7
	Pin Hole 11
Group 3(i) Points:	Goyet 66,77,95
	Renard 1
	Magrite 33,35
Group 3 Points:	Kent's 7
	Gough's 6
	Magrite 1,9,10,30,39,43,47,55,56
	Verlaine 5,42,43
	Goyet 10,26,48,69,70,73,76,169
	Maisières 6
	Frontal 6,16,17
	Spy 2,6,40,81,147,155,211
	Chaleux 78,79
	Renard 2,4
	Coléoptère 22
	Forêt 7,10
Group 4 Points:	Paviland 40,41
	Creswell 1
	Little Hoyle 1
	Torbryan 3
	Frontal 4,9,12,13
	Grotte de la Princesse 2,4
	Chaleux 59,76,80,106
	Spy 19,21,27,107,123,127,129,131,133,134,148,154
	Trou Magrite 4,5,8,14,15,20,21,25,36,44,46,58,60, 62,65,68,69
	Forêt 4,5,6
	Goyet 3,21,53,65,67,71,79,80,81,108,133,134,138, 142,143,144,145,148,151
	Remouchamps 4
	Verlaine 4
Split-based Points:	Goyet 106
	Spy 4

Magrite 3,16,17,18,59,61,66

Spindle-shaped Points: Magrite 2
Maisières 32
Goyet 7,13

Whittled-based Points: Goyet 140
Maisières 2,33
Magrite 6,7,19,54
Spy 156

Lozenge-shaped Points: Goyet 33,88

Miscellaneous:1: Spy 32

Antler Rods: (a) Forêt 2,3
Nutons 1,2,3,4,5
Frontal 22
Goyet 18,19,38,39,40,41,43,45,46,47,50,51,72,105,
123,136,137,146,155,160,163
Chaleux 1,28,29,30,31,32,33,34,35,36,37,38,39,40,
41,42,43,44,45,46,47,48,49,50,51,52,53,55,
60,63,65,75,77,84,116,117
Magrite 12,24,34,64
Verlaine 37,38,39,40,45

Antler Rods: (b) Church Hole 3,4,5
Mother Grundy's Parlour 7
Fox Hole 1,2
Chaleux 54,61,62,64,83
Frontal 31
Magrite 37
Spy 1
Goyet 42,52,167

Miscellaneous:2: Hyaena Den 1

Ivory Rods: (a) Pin Hole 6,8
Kent's 5
Paviland 12,20
Forêt 16
Maisières 61

Ivory Rods: (b) Paviland 8,13,26
Goyet 20,22,158,159,161
Magrite 63
Spy 10,52,53,54,55,62,69,92,93,94,95,96,97,99,100,
101,102,103,135,136,140,149,152,161,162,184,
191,192,194,199,202,207,243,254,256,260

Ivory Rods: (c) Pin Hole 2,3,5,7
Paviland 4,5,6,7,9,10,11,21,22,24,25,27,28,29,30,
31,32
Goyet 157
Spy 8,9,44,45,46,47,56,58,59,76,104,110,158,188
189,190,196,203,220,221,222,251,252
Magrite 42
Chaleux 113
Maisières 60

Barbed Points: Uniserial: Kent's 3,4,
High Furlong 1,2
Coléoptère 8,9,10,11,12,26
Biserial: Kent's 2
Aveline's 1
Goyet 109
Verlaine 1

Needles: Distal Pieces: Goyet 179,180,181,182
Coléoptère 4,7
Chaleux 10,13,14,15,16,17,19,20,22,26,27,120
Spy 183
Proximal Pieces: Goyet 176,183
Spy 182
Needles: Kent's 6
Church Hole 1
Goyet 170,178
Verlaine 2,3
Coléoptère: 1,2,3,27
Frontal: 1,2,25,26,28,29
Chaleux 3,12,119
Needle shafts: Paviland 38
Cat Hole 1
Coléoptère 5,6
Verlaine 6,7
Chaleux 18,21,24,25
Magrite 32
Frontal 27
Needle blanks: Paviland 39
Frontal 3,10,23,24,32
Chaleux 4,8,9,11,23
Goyet 8,171,172,173,174,175,177,184,185,186,187,188
Working débris associated with needle manufacture: Frontal 5,7,8,14,30
Coléoptère 18,25
Chaleux 5,6,7,58,67
68,69,70,72,
73,74,82,88
94,95,101
Spy 48,262
Goyet 56,156,165,166,
168
*Maisières 25

*In spite of its resemblance to the other artifacts in this group, it is unlikely, owing to its age, that an actual needle blank was extracted from Maisières 25, but rather some form of narrow point.

Pins: Kent's 1
Verlaine 50
Maisières 4

Bone segments with polish: Goyet 29,35,54,59,60,61,62,63,64,85,99,100,
101,107,135,147,150,152,153,154

Miscellaneous:3: Chaleux 103

Wedge-shaped segments: Paviland 33
Goyet 17,24
Coléoptère 16

Miscellaneous: 3: Chaleux 103

Perforated Bâtons: Gough's 9
Goyet 110, 111

Whistles: Goyet 127, 132
Maisières 44, 45
Chaleux 90
Verlaine 13

Spatulae: Paviland 1, 2, 3

Miscellaneous: 4: Maisières 7, 31

Beads: Type a: Goyet 2, 128, 129, 130
Paviland 15
Type b: Goyet 112, 113, 114, 115, 116, 117, 118
Spy 91, 169, 179, 210, 215, 230, 261, 267, 268, 291, 292
Type b blanks: Spy 217, 237, 238, 248, 250, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290
Type c: Spy 205, 239, 259
Type d: Spy 12, 13, 225
Type e: Spy 209, 224
Type f: Spy 213, ?218
Type g: Spy 204
Type h: Goyet 120
Spy 22, 23, 24, 30, 88, 187, 240, 241
Type i: Spy 25
Type j: Goyet 119
Spy 16, 17, 28, 29, 64, 65, 66, 89, 201
Type k: Magrite 72
Type l: Goyet 34

Ivory spheres: Spy 180, 269, 270, 271, 272, 273

Miscellaneous: 5: Goyet 122

Pendants: Paviland 17
Pin Hole 9
Ffynnon Beuno 1
Coléoptère 14, 17
Verlaine 49
Forêt 1
Grotte de la Princesse 3

Perforated Fragments: Pin Hole 12, 13, 14
Chaleux 57, 71, 91
Spy 31, 33, 117, 174, 177, , 226, 245
Goyet 126

Miscellaneous: 6: Coléoptère 15

Perforated Ivory Discs: Chaleux 110, 111

Ivory Rings: Paviland 43
Magrite 71

Grotte de la Princesse 5

Perforated Teeth: Kendrick's 1,2,3,4,5,6,7,8,9,10
Paviland 45,46,47,48,49
Kent's 10
Goyet 1,96,97,98,121
Coléoptère 28
Spy 14, 125,263,264

Perforated Shells: Coléoptère - 5 examples
Verlaine - 3 examples

Pieces with Incised Chevrons: Pin Hole 4
Renard 3
Chaleux 86

Pieces with Notched Edges: Church Hole 2
Maisières 26

Pieces with Curvilinear Incisions: Paviland 19
Mother Grundy's Parlour 1,4
Maisières 28
Goyet 15
Verlaine 29
Remouchamps 2

Pieces with a Lozenge Pattern: Maisières 8,22,23,24,37

Pieces with Simple Incisions: Mother Grundy's Parlour 2,5
Pin Hole 16,17
Chaleux 85,105
Verlaine 10,14,16,17,19,21,22,24,26,32,
33,35,41
Spy 47,130,141,160,185,229,247
Maisières 14,27

Pieces with Patterned Incisions: Pin Hole 15
Mother Grundy's Parlour 3
Verlaine 11,12,13,15,18,20,23,25,27,28
30,31,36
Goyet 6,16,20,25,65,124,125,131,154
Maisières 11,29,46,64
Chaleux 89,93,97,98,99,101,104,109
Spy 15,35,36,41,42,63,70,73,87,90,99,
111,112,115,126,165,168,200,211,
223,231,246
Coléoptère 21,23,24
Forêt 12
Frontal 20
Grotte de la Princesse 3,5
Magrite 25

Pieces with Elaborately Grouped Incisions: Gough's 5,7
Magrite 27,28,40
Remouchamps 1,5
Maisières 8

"Working Débris"

Extracted Pieces with No Further Modification: Gough's 8
Chaleux 92,114
Magrite 23,49,50,73
Spy 37,74,78,105
Renard 5,7,9,10
Forêt 8
Goyet 5,91,102,164
Verlaine 51
Maisières 39,50,55

Extracted and Modified Bone: Paviland 14,37
Spy 7,11,84,120,153,167,212
Renard 8
Verlaine 52
Frontal 11
Magrite 11,53,70
Chaleux 56,100,102
Coléoptère 13
Goyet 9,12,14,49,86,92,149
Maisières 54,63

Extracted and Modified Antler: Magrite 48,51,67
Verlaine 48
Chaleux 66,81,115
Goyet 27,28,58,87,103,139,141

Extracted and Modified Ivory: Paviland 16
Chaleux 112
Maisières 3,5,40,41,42,47,48,49,51,52,53
58,59
Renard 6
Goyet 89
Magrite 45
Frontal 15,21
Spy 18,26,49,50,51,57,60,61,67,68,72,77,
79,82,83,86,98,,106,108,109,116,118,
119,124,128,137,138,139,142,144,145,
146,151,157,159,164,166,178,181,186
193,195,197,198,200,206,208,216,219
227,232,234,235,242,244,249,253,255
258,265,266,

Modified Bone: Paviland 36
Gough's 10,11
Mother Grundy's Parlour 6,8
Nutons 7
Magrite 13
Spy 5,43,113,114,121,143,163,170,171,172,176,214
Goyet 57,84,90,104
Maisières 15,20,30,57
Frontal 19
Verlaine 8,9,34,44,46,47
Coléoptère 20
Forêt 11
Chaleux 107,108

Modified Antler: Spy 3
Remouchamps 3
Magrite 52
Maisières 35

Modified Ivory: Spy 71,80,228,236,257
Magrite 22
Maisières 10,38
Forêt 13
Goyet 30,31,32,83
Paviland 18,23,34,35

Bones with Minimal Modification: Forêt 9,14,15
Spy 34,38,132
Chaleux 121,122
Maisières 1,12,13,16,17,18,19,21,56

Pieces with traces of the removal of a blank by longitudinal sawing:
Spy 173,175
Frontal 18
Coléoptère 19
Chaleux 118

Sawn-off articular ends: Frontal 20
Chaleux 87
Pin Hole 18

Sawn-off segments of antler rods: Goyet 19,46
Chaleux 84

Appendix 4

Museums and Institutions visited in the Preparation of this Thesis

England and Wales

Ashmolean Museum, Oxford: A. Sherratt

British Museum: J. Cook, P. Robinson

British Museum (Natural History): C. Stringer, R. Kruszynski

Bolton Museum and Art Gallery: A. Thomas

Buxton Museum: M. Bishop

Cambridge University Museum of Archaeology and Anthropology: P. Carter

Harris Museum and Art Gallery, Preston: F. Carpenter

Manchester Museum: R.M.C. Eager

National Museum of Wales, Cardiff: S. Green

Oxford University Museum: P. Powell

Pitt Rivers Museum, Oxford: L. Cheetham

Royal Institution of South Wales, Swansea: M. Isaac

Tenby Museum: J. Tipton

Torquay Natural History Society Museum: B. Cooper

Trust for Wessex Archaeology, Salisbury: A. Lawson, J. Cross

Wells Museum: the Honorary Curator

Woodspring Museum, Weston-super-Mare: J. Evans

Belgium

Institut Royal des Sciences Naturelles, Brussels: A. Leguebe

Musées Royaux d'Art et d'Histoire, Brussels: M. Balty, J. Lefranq

University of Liège: M. Otte