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A Study of the Lithic Collections from Paviland Cave, and the Site in its Wider Context

by

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Contents:

Chapter 5: Interpretation:

Figures:

Tables:

Appendices:

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Terms and Abbreviations Used in Text.

Acc. No.	Accession Number
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BM	British Museum
BP	(Years) before present
ka BP	Thousands of years before present
EUP	Early Upper Palaeolithic
LUP	Later Upper Palaeolithic
NMGW	National Museums and Galleries of Wales, Cardiff
O.D.	Ordnance datum
OIS	Oxygen Isotope
O.S.	Ordnance Survey
OUM	Oxford University Museum
TL	Thermoluminescence (dating technique)
UWCN	University of Wales College, Newport

Chapter 1.

The Site and its Setting.

1.1: Location and Solid Geology

The site of Paviland Cave (more correctly Goat's Hole Cave, Paviland) is located on the south coast of the Gower peninsula; (Ordnance Survey map reference SS 437858). The Gower presents for the most part a gently rolling surface varying from 15-36m above sea-level, and bounded on its north, west and south sides by cliffs. The cave itself commands an imposing view over the Bristol Channel, Exmoor and Lundy Island often being visible. It is adjacent to a rocky ravine named 'Fox Slade', leading to the cliff known as 'Yellow Top' which provides the easiest access from the cave to the plateau of the Gower. The cave can be easily located by following a kilometre-long path through farmland. The path is signposted from the main road (B4247) in Pilton Green, leading towards Rhossili. It is approximately two kilometres east of Mewslade Bay, and three kilometres west of Port Eynon.

A central chain of hills rides conspicuously above the general level of this plateau and consists of Old Red Sandstone. To the south of this anticline are two well-marked synclines, introducing the shales of the millstone respectively at Oxwich and Port Eynon. These structural features run north west and are parallel. They fail to reach the west coast of the peninsula, where, through a number of small fault lines, the Old Red Sandstone circles round with a dominant north-south strike.

The altitude of the cave was determined in 1989: a paint cross on the bedrock directly outside the entrance is located at 13.34m OD. The cave entrance (Figs. 2.1-2.2) is pear shaped and inclined to the east, being 10m high and 7m wide, with a passage of approximately 30m length. The passage is above head-height for its whole length; running into the cliff in a south-south-west direction. As Sollas (1913) remarks, the sides of the cave are smooth but undulating, and have many small tributary channels and crevices. There are two large hollows in the floor, and a shaft leading to daylight visible 20m above, close to the east wall. The upper entrance to the shaft forms a pothole penetrating downwards from a ledge, of a horizontal keyhole shape, length 5m, maximum width 3m, and at a height of 32.08m OD.

A reading of Sollas' account seems to imply that both hollows were excavated completely. The outer hollow is almost circular and 3.5m in diameter, with sand and angular stones visible. The inner hollow is larger, being egg-shaped - 6m long and 4m wide, the outward pointed end filled with a little sand, wave-tossed pebbles and angular boulders. Beyond the hollows the floor rises for a distance of 10m and consists of curving solid rock except for a 1m long narrow hollow containing wave-tossed pebbles and water-worn sub-angular pebbles. From traces of breccia remaining attached to the walls it is possible to determine the minimum thickness of deposits removed:

Entrance: 5m

First Hollow: 5.5m

Second Hollow: 3m

Rear: 2m

The above figures are relative to the present floor level, and the sediments removed occupied a width of not more than 5m. There are sufficient remains attached to the walls to determine the composition of the breccia, and it may even contain fragmentary bones of animals suitable for radiocarbon dating. Lumps of detached breccia and stalagmite still litter the cave floor.

Paviland is accessible (without rock-climbing) at low tide only; although it is not itself within the tidal zone. However on 9th March 1989 following a storm and during a high spring tide (10.39m Swansea) the outer hollow became filled with sea water. With a maximum depth of 1m it is possible to calculate the volume as 16 000 litres, which drained away throughout the following month. This scouring by the sea revealed the surface of a possibly in situ breccia deposit (Davies 1993).

Below the cave and slightly to the east at beach level is a large, probably more recent sea cave, 'Black Hole', running in some 30m and accessible at exceptionally low tides. It is visible from the cliff as a boulder strewn chasm, 3m high and 2m wide. The whole length is completely filled at high water and a fresh-water spring was located at the rear. Until recently Paviland farmhouse was supplied with water from this spring.

A further cave, Paviland West or Hound's Hole, can be found about 50m west of Paviland and at the same altitude. It is a narrow rift 6m high by 4m wide and penetrates

30m with daylight reaching the end. The entrance faces south west. About halfway in there is a remnant of a stalagmite floor and a stalagmite bridge can be seen at a height of 3m above the bedrock floor. Presumably deposits filled the cave up to this height, but the sea has removed them. According to Davies (1993) this cave is also of phreatic origin, and is wave modified. It is reputed to have yielded animal bones (Buckland 1823).

It is possible, therefore, to think of 'Paviland' as Paviland Cave (as used in this study); or the area of Paviland as a complex of three caves.

With respect to Paviland there are two different geological questions to be considered. The solid geology of the surrounding area will be described in the following pages, including a basic account of the geomorphology of Gower. Second, the origins of the material which was found in the cave; that is the flint and various types of chert used to make tools, will be addressed. Possible sources of these materials will be expanded upon in section 5.2, but an introduction is provided below.

The Gower peninsula is an area of Special Scientific Interest, and also of great natural beauty. The existence of the caves, both coastal and those inland, for example Cat Hole near Parkmill is due to the fact that the Carboniferous (Dinantian) limestone shale, in which they occur is susceptible to cave formation, being easily eroded. The rock includes bands of black tabular cherts laid down around 360 million years ago, at the same time as the coal for which the area to the north and east has been extensively worked. It would therefore have been possible for the inhabitants of Paviland Cave to have picked up a raw material, albeit of poor quality, from the nearby cliffs. Unfortunately for the archaeologist, these cherts do not preserve any (visible) fossils, being fine grained although laminar; so sourcing cannot be accurate. Towards south-west Wales, the Dinantian limestone thins as sandstone becomes the predominant base.

1.2: The Effect of Glaciations.

The Welsh uplands focused as gathering grounds for ice accumulation on several occasions and its margins were invaded several times by an ice sheet with origins farther north in the Irish Sea. This means that on each successive occasion the combined efforts of valley glaciers, ice caps and ice sheets would have effectively destroyed much of the

evidence for earlier events. In the case of Gower, till was produced which overlies the limestone base.

The ice limits of the last glacial maximum, which took place towards the end of the Devensian cold stage, with limiting dates of 23 000 and 13 000 BP are shown in Fig 1.1. These are of prime interest to the archaeologist studying Paviland, as human occupation is linked to the very variable late Pleistocene climate. Devensian till blanketed most of Wales although south Gower was outside the maximum extent of the Devensian ice. Even so, the periglacial environment would have had a major effect. Quaternary events evident in south Wales are recorded as the edges of Glacial till; or sands, gravels and head deposits, and features such as river terraces and raised beaches. Numerous earlier deposits occur, principally consisting of colluvial (red) beds, limestone scree, and redistributed older (pre-Devensian) glacial deposits, the redistribution being ascribed to the early and middle Devensian.

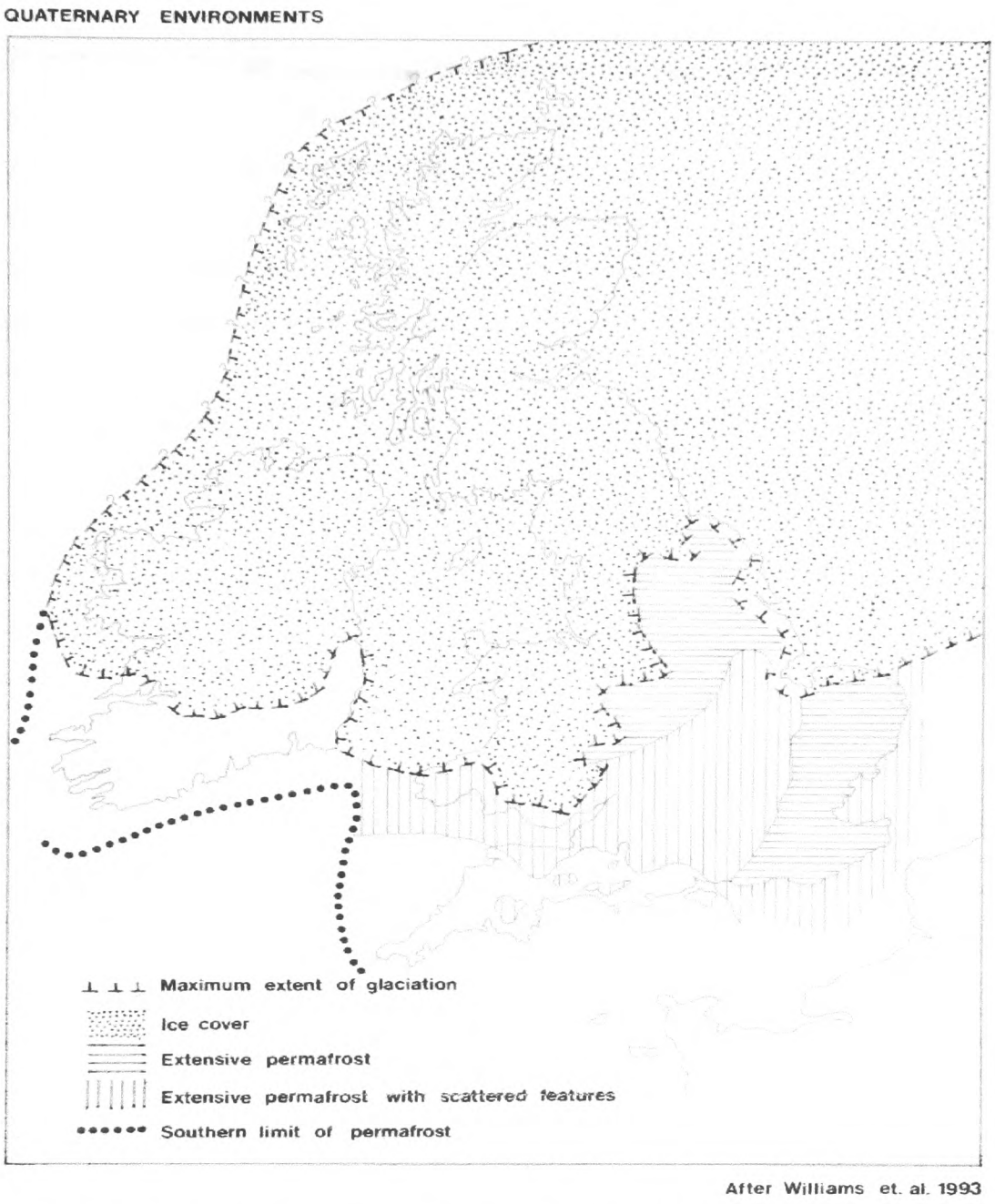


Fig. 1.1: Ice Limits at the Devensian Maximum (c. 18 000 BP).

After initial deforestation at the end of the previous interglacial, soil erosion, sheet wash erosion and colluviation occurred, followed by the shattering effect of a frost climate on exposed bedrock slopes. The British Geological Survey in the 1920s and 1930s demonstrated that glaciers originated from two sources: the Irish Sea on the west

and from Central and South Wales to the east and north. This was clearly indicated by the different suites of erratic rocks (relatively large rock fragments lithologically distinct from the underlying bedrock, either free or as part of a sediment) found in the tills, the sources of which can be identified. The tills became referred to as the Irish Sea Drift and the Welsh Drift and, where they meet, there is a mixed assortment of erratics within them (Wessex Archaeology and CADW report 1996). South of this limit, older drift glacial deposits are widespread on the south and particularly the western margin of the peninsula.

The direction in which the drift travelled can be approximately ascertained: it had a southerly element as seen in the distribution of Old Red Sandstone boulders from Cefn-y-Bryn. The stones are plentiful on the south side of the hill, but are absent on the ridge's north side. Fragments of radiolarian chert occur in numbers in drift on the coast south of Overton; they can only have come from Port Eynon, half a mile to the north (George 1933).

The nearby cave of Bacon Hole contains the only potentially complete and demonstrable lithostratigraphic, biostratigraphic and geochronological record of early Devensian time in Britain (Stringer et al. 1986). Uranium-thorium age determinations on the stalagmite sequence show that a major part of the last interglacial or Ipswichian (OIS 5e) is represented at this site.

Raised beaches record changes in sea level and can be found on the peninsula. It may be inferred that when the raised beaches were in process of formation some Gower caves were filled by the sea; and consistent with this, in Bacon Hole and Minchin Hole a fossil beach has been found, containing marine littoral shells, which lies immediately upon the rocky floor, and is itself covered with other deposits. This may be of OIS 7 or 9. There are also *Patella* and *Neritodes* beaches (named from the shells they contain) which are considered to be of Ipswichian age.

1.3: The 1997 Excavation: the Current Research Project Field Assessment.

Aims of the Field Assessment.

Paviland, Hound's Hole and Foxhole Slade Cave were investigated during the field season from June 21st to July 12th 1997, under the direction of Dr. Stephen Aldhouse-Green, University of Wales College, Newport. Information gained added to the descriptive data available for the Paviland caves. There were three prime aims of the field assessment (Aldhouse-Green 1997,3):

1. To produce a definitive survey of the caves, and record surviving areas of deposit.
2. To excavate half of Hollow B. Hollow B is the outer of two sediment-filled hollows in the bedrock floor of the cave.
3. To collect naturally detached specimens of cemented breccia and stalagmite which litter the modern floor of the cave, for analysis and preservation in the National Museums and Galleries of Wales.

Paviland.

An *in situ* deposit was revealed in Hollow B (Aldhouse-Green 1997,5) composed of small, angular limestone clasts in a sediment matrix. This deposit probably formed part of a talus cone, now completely eroded, of colluvial origin (Aldhouse-Green 1997), the accumulation of which probably spanned the entire Devensian. There were a series of layers of very fine definition within this colluvium (Layers 3,6,7,8). No such stratigraphy was recorded by Sollas (1913) in the archaeological layers. However an overall stratigraphy can be reconstructed (reproduced below from Aldhouse-Green 1997).

Table 1.1: Stratigraphy of Paviland Cave.

Layer	Interpretation	Finds	Climate	Age (OIS)	Source
A - Stalagmite	Porous stalagmite and marine shells	_	warm	1	Aldhouse-Green (1997)
B - Upper Scree 1	Small angular scree and rounded clasts	artefact and fauna rich	cold	2-3	Sollas (1913)
C - Ochreous Clay	Not clear – reworked ochre	artefact and fauna rich	cold	2-3	Sollas (1913)
D - Upper Scree 2	Small angular scree and rounded clasts	artefact and fauna rich	cold	2-3	Sollas (1913)
E - Grey-white Band	Weathering of underlying deposit	none	?warm	?5e	Sollas (1913)
F - Pebbles and Sand	Beach deposit	none	?warm	5e	Sollas (1913) & Aldhouse-Green (1997)
G - Lower Scree	Small angular scree and rounded clasts	fauna rare	cold	6	Aldhouse-Green (1997)
H - Bedrock	_	_	_	_	_

The Devensian cave sediments were capped by a stalagmitic floor, probably of Holocene age. Fragments of this floor containing modern seashells are preserved cemented to the cave wall at a height of 5m or more from the bedrock floor. The external face of the talus cone would have been eroded by rising sea levels at the beginning of the Flandrian, leading to a collapse and slumping of the deposit, and possibly a reduction in the accessibility of the cave. This may be part of the explanation for the few post-Mesolithic finds from the site.

The artefact-bearing levels are B, C and D, which also produced a cold climate, Coygan-type fauna (Currant & Jacobi 1997) typical of OIS 3. The grey-white band E was interpreted by Sollas as a weathering horizon which may indicate a hiatus in scree formation corresponding to a milder climatic phase. On the northern side of the cave it is coextensive with a beach deposit, a layer of sand and rounded pebbles; Layer F. It is thought (Aldhouse-Green 1997) that Layer F could be of Ipswichian (OIS 5e) age as, during this interglacial the sea level would have been sufficiently high as to wash into the cave, as noted for Minchin Hole Outer Beach, and raised beaches at a similar height to Paviland in South Wales (Bowen 1970). The fact that Sollas reports the layer of beach pebbles as thickening toward the wall of the cave, where they "descended in a vertical sheet" (1913, 336) lends support to the interpretation that Layer F may be Ipswichian. Some cave deposits undergo "shrinkage" away from the cave walls, leaving spaces down which overlying - younger - sediments may move (Aldhouse-Green 1997).

The emplacement of the beach would have occurred together with removal of previous sediments, and reshaping of the cave entrance. Denekamp Interstadial (30,000 BP) high sea level stands during OIS 3 may also have been of sufficient height (Milliman & Emery 1968, 1123) but the resulting deposits, if any, have been lost through modern erosion and excavation.

Layer G underlies the beach deposit. No artefacts were recovered from this Lower Scree, although a cold climate fauna, heavily mineralised and splintered, was recovered. This fauna is not chronologically diagnostic but, if Layer F is of 5e age, the Lower Scree would belong to OIS 6 (Wolstonian glacial). A date on the Lower Scree was produced by

TL: 169 +23/ -46 ka BP (QTLS-PVG 11). There is a 68% probability that the layer F sediment was deposited between 290 ka - 124 ka BP. At 2 standard deviations, giving 95% confidence, the age of the sediment is >102 ka BP, with an infinite upper limit. Comment by Debenham (in Aldhouse-Green 1997) states that the sample was most likely last exposed to light before OIS 5. It is likely to be of OIS 6 age.

Hound's Hole.

In 1997 a trench was opened up at right angles to the line of the cave, in proximity to the breccia on the west wall. A sequence of cemented breccias and stalagmite, as well as uncemented deposits, was revealed. A sparse fauna was recovered from layer 3, which although not as heavily mineralised, appears to be similar to that from Layer F in Paviland. One TL date from the base of a broken stalagmite pillar gives 130 ± 16 ka BP (QTLS-PVH 11), an Ipswichian age. The underlying deposit, a breccia which is probably the oldest encountered in Hound's Hole (layer 6) may therefore be of OIS 6 age, contemporary with the basal deposit in Paviland. A single lithic find came from the cave - a fragment of thick blade possibly made on volcanic tuff. Whilst not a diagnostic find, the selection of a non-flint raw material and its thick-blade technology are suggestive of an Early Upper Palaeolithic age. The find came from the base of the modern storm beach and so was not securely stratified (Aldhouse-Green et al. 1997,8).

Foxhole Slade Cave.

A trench was excavated to a depth of 0.85m, revealing a sequence evidently much disturbed by animal activity. There are two main layers, a Humic Scree (Layer 2) overlying a soliflucted Scree (Layer 3). Both layers produced artefacts of Early Mesolithic date, as well as modern material which had been introduced through animal burrows. Also present was a flint blade fragment with steep retouch, potentially of Late Upper Palaeolithic age. Layer 3 produced a Pleistocene fauna including reindeer and collared lemming. Foxhole Slade Cave can be identified as only the third Early Mesolithic site known in Gower - along with Burry Holms (Green & Stanton 1984,) and Cat Hole (McBurney 1959; Campbell 1977, 55). Foxhole Slade Cave is only a few miles

from Rhossili where Worm's Head cave yielded a human ulna dated to 8,800 ± 80 BP (OxA-4024). It is close to Paviland where later Mesolithic human remains have been dated to 7,190 ± 80 BP (OxA-681). Underlying sediments at Foxhole Slade Cave may well preserve undisturbed evidence of Upper Palaeolithic occupation (Aldhouse-Green 1997).

Chapter 2.

The History of Research.

2.1: Introduction

The site of Paviland Cave has long been known to archaeologists, and has undergone a series of interpretations, repeatedly being used to reinforce the thinking of the age. The history of Paviland, therefore, is closely linked with the history of thought in Palaeolithic archaeology and can be used as an excellent example to illustrate the changes in excavation and research technique.

During the early to mid nineteenth century, when a great deal of the deposits at Paviland were removed, archaeological work was carried out mainly through the activities of amateurs and unofficial organisations. Paviland is mentioned in all Upper Palaeolithic textbooks today, but its history of research is mainly a story of antiquarianism and amateur interests. However these have not been without insight, and it is possible to say that the problems posed by Paviland have added to the evolution of Palaeolithic archaeology.

It is possible to trace the documentation of the majority of the existing finds to their donors and hence in some cases the excavators. Most of the lithic finds fortunately survive, but the same cannot be said for the faunal evidence. Sollas (1913) mentions sending 'about 300 lb' (136 kg) weight of bone consisting of hundreds of fragments to the Oxford University Museum, but this has not been retained. There is no record at all as to the quantity of fauna Buckland and his co-workers recovered (A. Turner, unpublished MS). The surviving fauna amounts to 200 pieces housed in the NMGW, and less than 50 pieces in the Swansea Museum collection.

Site plans and site records, if once they existed have also not survived, although an extensive search has been made in the archives of the Oxford University Museum, the NMGW, Cardiff, and in the letters ascribed to J. W. Jackson and William Boyd Dawkins in Buxton Museum. It appears that no mention of Paviland is made in Sollas' surviving notes and letters. This unfortunate state of affairs is true of many British sites, where owing to the zeal of the antiquaries who first explored them, little sediment remains on site, and only limited records in museums.

The most prominent figures involved in research at Paviland are outlined below. The number and quality of finds noted from the cave, and also its imposing size and dramatic situation on the Bristol Channel coast seem to have always attracted the attention not only of local collectors and gentry, but also of the most prominent archaeologists of the time. Unlike the collectors, they possessed much experience and the ability to excavate to a higher standard.

Most of the finds including the 'Red Lady' are currently housed in the Oxford University Museum, since the two main figures in Paviland's history held positions at the University. These were the Rev. William Buckland (1784-1856), Reader in Mineralogy and Geology from 1813, who carried out the first recorded excavation; and Professor W. J. Sollas - who undertook to review some of Buckland's conclusions a little less than a century later.

2.2: 1823 and Before, the Work of William Buckland.

Paviland had been known to the local farmers and inhabitants of Gower long before any archaeological investigation took place. The first reliable records of its examination are noted in Buckland (1823), who states that it was explored in 1822 by the surgeon and curate, Lewis W. Dillwyn and John Traherne, of the nearest village, Port Inon (Eynon), although Trinkhaus and Shipman(1993,35) coalesced them into one 'intrepid' surgeon/ curate. They discovered a fragment of curved tusk and two molar teeth which they attributed to elephant, and reburied them, presumably for protection. The finds remained buried until the December of that year, when Mr. Dillwyn and the landowner's eldest daughter, Miss Jane Talbot of Penrice Castle, removed them, together with a large part of the skull, and 'several baskets' full of other teeth and bones.

These discoveries were reported to Oxford, and the Reverend William Buckland, Professor of Geology came to hear of them. He left Derbyshire, where he was working on a newly discovered cave-site near Wirksworth, and immediately set out to visit Paviland. He viewed Miss Talbot's finds at Penrice Castle, and then undertook excavations for six days during mid January 1823 (Edmonds and Douglas 1976).

Fig. 2.1: Illustration of Paviland from Buckland's *Reliquiæ Diluvianæ* (1823).

A description of Paviland as he found it, and a list of fauna he recovered is given in his treatise, '*Reliquiæ Diluvianæ*,' published in 1823. The sub-title is '*Observations on the Organic Remains contained in Cave, Fissure, and Diluvial Gravel, and on the Other Geological Phenomena, Attesting the Action of a Universal Deluge*'. Buckland was, at first, an ardent supporter of the Great Flood theory prevalent at the time. Thus, all his opinions were coloured by the necessity of linking his observations with the phenomena recorded by the Bible, in a very short chronology. He had himself popularized the idea that Cuvier's 'geologic revolution' was the same event as the Biblical Flood (Trinkaus and Shipman 1993,24). Buckland also held the position of Dean at Westminster Abbey throughout his geological career. He saw evidence of the Flood in 'the immense deposits of gravel that occur occasionally on the summits of hills, and almost universally in valleys over the whole world; in situations to which no torrents or rivers such as are now

in action could ever have drifted them.'(Buckland 1823) The shape and position of geographical features had been modified by 'the action of violent waters' and it was a natural assumption to relate this to the Old Testament account of the Deluge.

In actual fact, Diluvianism proved an elaborate issue, as there were many possible variations in interpretation within the theory. A letter from Buckland to Lady Mary Lucy Talbot dated November 26th, 1821 offers a clue as to the nature of his belief:

> 'I shall be very much obliged if you will have the kindness to ascertain if there be any traces of caverns or fissures still remaining, which may have been connected with that in which the bones were discovered - if there be a fissure, pray examine if its upper part be filled with Stalactites, and also whether there are any rounded pebbles in any part of it.'

The inquiry about stalactites and rounded pebbles was made with a view to discovering how the bones got into the fissure. The presence of rounded pebbles would favour the view that the contents had been washed into a fissure by moving water (i.e. the Flood), but stalactites indicate a different mode of collection, possibly that the animals had either walked or been dragged in, possibly by hyaenas as seen in Kirkdale Cave, Yorkshire. Buckland was encouraging careful observation, hardly advocating blind faith. He even went to the extent of observing a captive hyaena in the Royal Menagerie, to ascertain the method by which it broke bones, and the patterning produced: a good example of experimental archaeology (North 1942).

On the other hand, Buckland was quick to query the conclusions of his contemporaries on archaeological issues, strong in his belief in the late appearance of mankind. He took issue with the Rev. John MacEnery who, during the late 1820s was conducting excavations in the large and complicated site of Kent's Cavern. Buckland argued that ancient Britons, who occupied the cave after the deposition of the stalagmite layer, had dug ovens in the stalagmite and that the artefacts found below the stalagmite layer were introduced though these ovens. MacEnery maintained his opinion that the implements predated the stalagmite layer under which they were sealed, although he did not like to dissent from Buckland's 'high authority'.

In addition to the high esteem in which he was held as a man of learning, Buckland was also regarded as an entertaining, often irreverent character. To his students' amusement, he would give geological lectures on horseback (which certainly allowed a wider view of the landscape), and even those lectures conducted under more formal academic circumstances were often imbued with jokes and popular references. He had a broad and long-lasting influence on geology, having trained many of the greatest of his successors, including Charles Lyell and Roderick Impey Murchison. His excavations were also a source of inspiration for those with an archaeological interest such as MacEnery.

In his later years Buckland recanted the Deluge hypothesis and embraced the conviction, rapidly growing in the scientific world, that a long chronology following Uniformitarian principles was needed; an about-turn in thinking that does him much credit. It was greatly due to the work of Louis Agassiz, a Swiss geologist who, in a comparative geographical study, demonstrated the former existence of ice sheets in presently unglaciated areas. Buckland realised that some of the boulder clay deposits attributed to the Flood were in reality the outcome of ice action. In reporting Buckland's death in 1857 the President of the Geological Society, General J. E. Portlock commented 'the greatest merit is not to be ascribed to men who have never altered their opinions, but rather to those who have frankly endeavored to advocate the truth, however opposed it may have been to their first opinions' (North 1942).

During the excavations at Paviland, Buckland found the left side of a human skeleton which also lacked the cranium and vertebrae. The bones were contained in a mass of iron oxide (ochre), which he described as 'ruddle', and which had dyed them red. They were certainly part of a burial, but it is important to note that the skeleton was under a shallow covering of only about six inches of earth, presumably erosion had reached such an extent that the grave itself was damaged. The skeleton was accompanied by 'two handsfulls' of small shells (*Nerita littoralis*) by the left thigh, and the rib cage was overlain with around forty fragments of small rods and rings carved from ivory. The shells found with the burial were perforated for suspension, and may have formed a necklace. They were in a delicate state, mostly fragmentary and ochre stained.

Surviving today, there are 31 fragments of ivory rods, cylindrical and semi-circular in cross section which can be reduced to 23 sections after repair (Jacobi 1980). The longest of these sections is 97 mm. Their diameters range from 8-14 mm; there are no pointed pieces and no traces of any bevel, hence they are usually ascribed to ritual use, or as blanks for bead making, rather than functional tools. In the NMGW reconstruction (Green & Walker 1991) they have been interpreted as wands, the implication being that they were used for dramatic ritual rather than body adornment.

Although, in the literature much attention has been paid to hunter-gatherer art, in the form of parietal cave art and portable artefacts, little attention has been given to body adornment in any form. The term 'body adornment' as given by Simpson (1996) encapsulates many means of expression, including ornamentation, clothing, tattooing and body painting. The Paviland burial, along with similar but more fragmentary human remains in Pin Hole Cave, Creswell Crags, and Kendrick's Cave, offers a small British sample. Granted, the direct evidence for adornment is rather limited, but comment must be made on the objects found, since ethnographic research (for example Marshall 1976) has illustrated that, where body adornment is used, it is crucial to the social persona of that group.

The materials used for adornment - in this case small shells, teeth and mammoth ivory - may have been acquired on ideological grounds and used to convey certain messages. It is unfortunate that the British burial data does not give us many clues as to how and exactly where on the body certain ornaments were worn.

The burial was almost immediately nicknamed the Red Lady or Witch of Paviland, but in a private letter Buckland mentions that the skeleton was first thought to be male. In this he was correct, but for the wrong reasons - he thought it was the remains of an exciseman, who was perhaps overpowered by smugglers. Buckland gave a special lecture to announce the discovery, at the Ashmolean Museum, on 15th February 1823. In an illustration from *Reliquiæ Diluvianæ* the skeleton is represented as complete, and lying lower in the deposits than the text describes. Buckland assigned the skeleton to the Roman era, contemporaneous with an Iron Age camp, or hill fort still visible on the top of the cliff above. There were implications that 'Red Lady' was an appropriately dual

title, that she had been a woman 'no better than she should be', the camp offering a 'motive for residence, as well as a means of subsistence.'

In addition to the 'antediluvian fauna', other finds noted by Buckland included more recent remains, such as 'a portion of the scapula apparently of sheep,' and fragments of Roman pottery. A complete samian ware bowl was recovered, now in Swansea Museum (formerly the Royal Institution of South Wales, Swansea); as are two coins of circa A.D. 300, dating to the time of Carausius (A.D. 287-293) and Constantine the Great (A.D. 274-306).

Buckland assumed these, and the recent fauna, to be contemporary with the burial, and suggested that the witch may have practiced scapulamancy, a method of divination using shoulder-blade bones. On the other hand he could not discount the ivory artefacts in direct association, and ingeniously suggested that they were carved from Diluvial material washed into the cave, which although long buried, was still workable. Buckland identifies them as fragments of armlets, and gaming pieces.

A tongue-shaped ivory plaque (87 mm in length, 40 mm width) and three spatulae were also found, but not with the burial, and it is not clear whether they were associated finds. A 'skewer' made from the metacarpal bone of a wolf was also noted. Buckland groups all finds with the Red Lady, producing an assumption to the effect that the cave was occupied at one time, by one person only, and all finds were associated with 'her' life.

Buckland wrote that 'no metallic instruments were discovered' and noted fragments of charcoal, and one flint, 'the edges of which had been chipped off, as if by striking a light.' This artefact cannot be identified amongst the collections today, but in the British Museum (Quaternary Section) three flint blades and a rhyolite flake are preserved which are attributed to the 1823 excavation. They were donated by H. Buckland, his grandson. Apparently Buckland, or other members of his team, observed more flints than were recognised in his publication: in a private letter to Lady Mary, dated December 3rd 1823, he tentatively notes: 'most curious are some slices of flint with sharp edges, which were apparently used as knives and may possibly have been employed to cut the ivory rods.'

Spoil from the excavation was thrown into the sea, so effectively lost. Finds from Hound's Hole are now likely to be lost or inseparable; Buckland collected 'two baskets full' of teeth and bones from this cave, in which ox, horse, deer and bear are noted.

In *Reliquiæ Diluvianæ*, Paviland is compared with a number of German caves, for example those at Muggendorf and Peckaw, with which the author was familiar. He believed firstly that they had been formed in the same way, being the 'truncated extremities' of larger pre-Diluvial systems damaged by the Flood. A similar explanation had been given for the numerous Cheddar Gorge caves. Around this time, many discoveries were being reported, and much cave hunting was taking place across Europe. Buckland wrote: 'If I don't get my book out soon I shall be overwhelmed with the multitude of them all telling the same story.'

2.3: The Excavations of Prof. W. J. Sollas.

Buckland's view as to the age and identity of the Red Lady remained unchallenged until 1911, when M. Cartailhac, an authority on the caves of France examined the material at Oxford and came to the conclusion that the bones belonged to a much earlier period than was originally supposed (Lartet & Christy 1875, 93). He assigned them to the Palaeolithic, within the Aurignacian, a subdivision which had only been recently recognised by Gabriel de Mortillet (Mortillet 1872). The view was confirmed by other French authorities, notably Lartet and Christy whose work, *Reliquiæ Aquitanicæ*, published in 1875, was much respected.

Small excavations and forays by flint collectors at Paviland continued throughout this time. A member of a distinguished Swansea family, the Hon. Odo R. Vivian presented his collection to Swansea Museum in 1909. George Grant Francis (1814-1882), an enthusiastic antiquary, with his friend John Gwyn Jeffreys (1809-1885), a conchologist, donated their collection to Swansea in 1836. It is possible that some of their finds had been retrieved during Buckland's excavations. Chambres, the headmaster of Wigan Grammar School, and Morgan undertook their own excavations in 1911. Eight flints from Paviland, originally in Sir John Lubbock's collection, were donated to the British Museum by Lord Avebury in 1869.

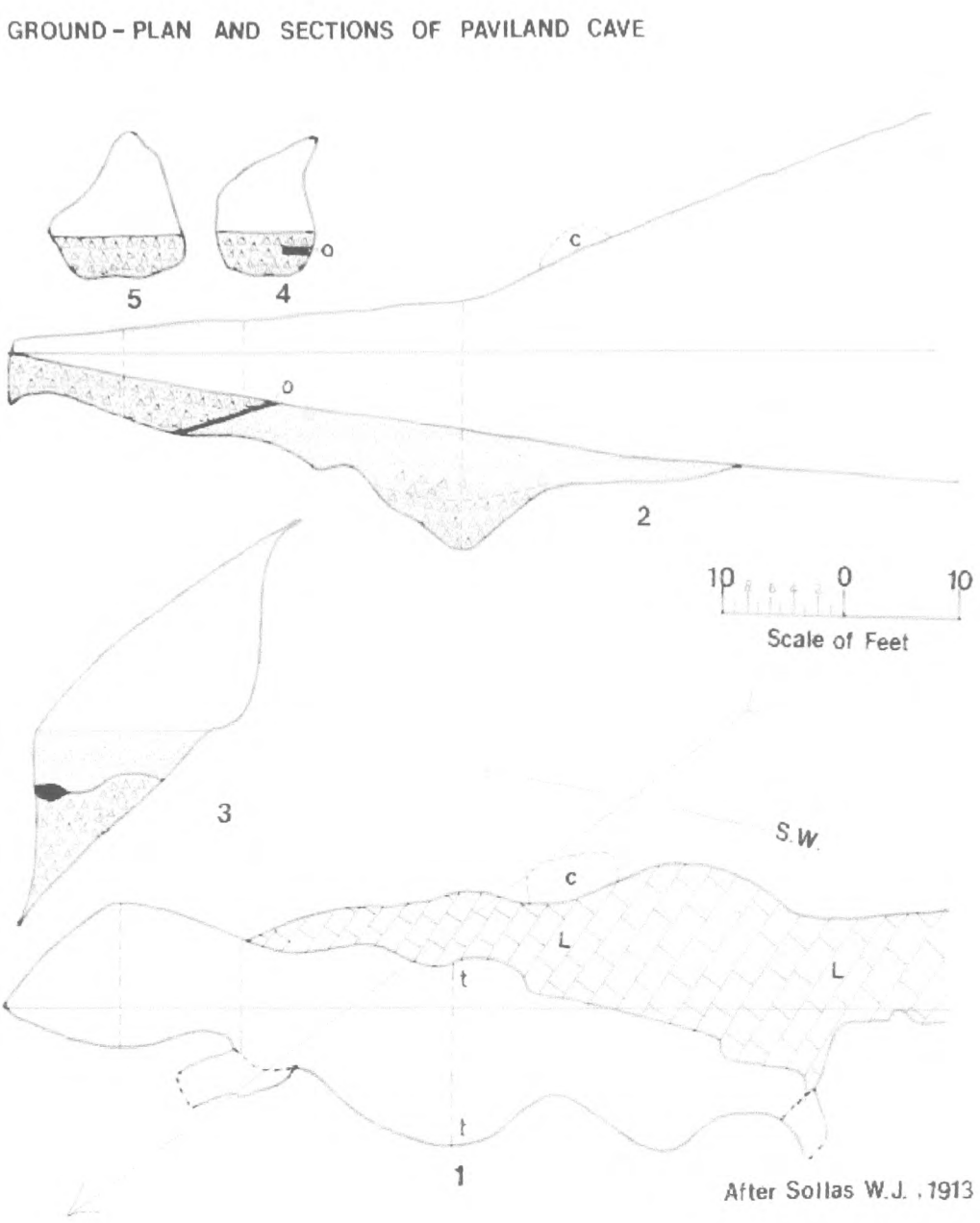
The Swansea Museum pieces attributed to Mr. Johns, and dated 1910 were reported to have been found not in Paviland itself, but in the sea cave below, after a storm. A 'considerable number' (Morgan 1910) of flints were found in a subsequent exploration, but the approach was so slippery that the investigators, W. L. L. Morgan and Mr. Glascodine had to give up an attempt to reach the end. The finds are of small size (3 cm length), obviously rolled and water-worn. Morgan surmised 'some connection between this cave and the one above... the flints have been washed down.' It is probable that these flints originated in Paviland and were moved into the sea cave during the storm, or over a longer period of time. They may even have come from Buckland's spoil which was tipped into the sea somewhere near this point.

All the successful efforts of collectors served to draw attention to Paviland as a site continuing to yield rich finds. In 1912, Buckland's successor in the Chair at Oxford, Professor William J. Sollas, decided that the time was ripe for a further investigation. By now, much more was known about comparative sites in France, and a Palaeolithic sequence had been confirmed. Sollas spent several weeks of the summer digging at Paviland in the company of the Abbé Henri Prosper Breuil. Cardiff Museum was represented by Mr. Arthur Loveridge. Dr. Marett, Mr. C. J. Bayzand and Mr. Henry Balfour accompanied Sollas from Oxford, whilst Mr. Ward, Harry Long and Jack Gibbs were part of the team.

Sollas' monograph on the site (1913) was the text of the Huxley Memorial Lecture of December 1913: 'Paviland Cave, an Aurignacian Station in Wales'. He gave a full description of the cave, together with a plan which has been reproduced below, and noted that it had been 'much disturbed'. He gave a full description of the cave, together with a plan which has been reproduced below (Fig. 2.2), and noted that it had been 'much disturbed'. Sollas' intention was to determine whether any industrial layers existed, and he reports that there was no definite stratigraphy (1913, 336) apart from a broad division of reddish-brown implement-bearing deposit (5 feet maximum) and underlying barren cave earth (14 feet maximum). Finds were dealt with by collection without provenance or any measurement (apart from the date), and subsequent typological analysis by Sollas and Breuil. This strategy accounts for the rapidity of his work, an advantage being that it

produced the largest, most homogenous collection from the site. That sieving was employed to some extent is known as one end-scraper[1] has 'screening Sunday, upper end of cave' written on it. Very small fragments were retrieved in Sollas' excavation (<50 mm).

[1]NMW Acc. No. 24.94/164B



1. PLAN OF THE FLOOR: b b Limestone Boulders, s Supposed Position of the Skeleton t t Line of Transverse Trench, L L - Limestone Not Covered with Cave-earth, c Projected Position of the Chimney

2. LONGITUDINAL SECTION: o - Band of Ochreous Clay

3., 4., 5. TRANSVERSE SECTIONS taken at positions bearing corresponding numbers in 2

Fig. 2.2: Plan of Paviland from 'Paviland Cave, an Aurignacian Station in Wales'. (Sollas 1913).

Professor Sollas was able to collect over 4 500 flint and chert pieces, which are now distributed between the NMGW in Cardiff, and the Oxford University Museum. Of these some 600 were tools. His excavations failed to reveal the existence of any stratigraphy meaningful in terms of artefactual sequence, and consequently the Abbé Breuil classified the implements solely on their characteristic morphological characters, grouping them into five possible classes, as described below. In Sollas' book *Ancient Hunters* (1911), the Aurignacian culture is compared with that of Eskimos, and by a stretch of ethnography, cave art and bushman art are contrasted.

Breuil's classifications were taken to represent the various occupations of the cave, although Sollas is quick to qualify this: 'It will be understood therefore that an implement which is assigned say to the Mousterian class is not necessarily of Mousterian age. Indeed it may be added as an independent statement that implements of Mousterian workmanship are well known to occur in Lower Aurignacian deposits' (Sollas 1913).

The Abbé Breuil (1877-1961) was known primarily for his skill as a draughtsman, demonstrated by his many recordings of Upper Palaeolithic art mainly in France and Spain. Breuil was therefore the ideal authority to assist Sollas at Paviland during 1911 and 1912. Being a man of great energy while in England he also explored Bacon Hole, noticing the 'ochreous bands', which he thought were possibly parietal art, although this is now discredited as ochre occurs naturally in the limestone. Breuil worked on the Red Crag collection from Norwich (Moir 1926,23), and offered his opinion on many other finds. He was wrong, however, in the case of Piltdown skull, discovered in November of 1913, which he took to be 'of the same age as the Crag material.' It seems that Breuil must have travelled repeatedly to and from England while undertaking this work, since he found time to give a paper in Spain, at La Pileta, during 1912; on 'The Subdivisions of the Upper Palaeolithic and their Significance'.

Brodrick (1963) writes: 'It was a joy to see him settle down to a table spread with cailloux, or 'pebbles' as he called them, and with extraordinary rapidity sort them out, discarding some (by just tossing them over his shoulder very often!) and arranging the others according to type; to a casual onlooker, one caillou might seem much like another.' It is tempting to imagine the Abbé dealing with the Paviland material in a

similar fashion. However, very few have since found cause materially to doubt his judgement.

Breuil noted a Mousterian, and a pseudo-Mousterian industry, at Paviland. These were differentiated primarily on the basis of their similar orange/yellow staining, but included 'disciform bodies... sometimes spoken of as sling stones' which may be disc cores, and some types of 'grattoirs' which are probably simply edge damaged flakes. Breuil referred 'pseudo-Mousterian' to the Aurignacian Age, although it was said to resemble the Mousterian. The Aurignacian proper he split into three, Lower, Middle and Upper; and concluded the sequence with the 'proto-Solutrean'.

By contrast, today, leaf points diagnostic of the proto-Solutrean would be recognised as potentially contemporary with the earliest Aurignacian, and come first in the sequence. Breuil's 'Upper Aurignacian' is a late glacial industry and should probably be termed Creswellian in Britain. Breuil's experience had been on French sites, and possibly he saw Paviland as a marginal site in which the classic types were degraded or yet to evolve.

It must be noted that all the implements and debitage which Breuil classified, retain the original labelling. In the NMGW this is due to the endeavours of W. F. Grimes who in 1939 published a full catalogue of the Museum's collections, illustrated and with an account of the history and prehistory of Wales. In 1951 a new edition was produced, edited by H. N. Savory, then Keeper of the Museum's Department of Archaeology. Many of the Oxford pieces are recognisably illustrated in Sollas' monograph and their original categorisation can therefore be deduced.

The artefacts of bone and ivory should be mentioned, being 'turned up by the spade in great numbers' (Sollas 1913,35), but most broke up through drying out too quickly when removed from their sedimentary context. Some which did survive excavation have subsequently been lost, and so only a limited amount of bone and ivory is available to study today.

An egg-shaped ivory pendant was found, the surface of which was naturally smooth, and slightly stained with iron oxide, and which had been pared away and a hole bored from one side at the pared end (Garrod 1926). This proved to be a naturally

produced growth, formed in response to a wound or blow to the pulp cavity of a mammoth tusk, for in Buckland's collection a tusk fragment was found bearing the cavity from which the lump had been taken. This demonstrates that ivory working had taken place on site, since the objects can be refitted over twenty thousand years later.

No human remains were recovered by Sollas, but he does indicate the approximate position of the Red Lady in his diagram (Sollas 1913), in Fig. 2.2. The skeleton was by this time agreed to be that of a man, a little over twenty-five years of age and about 1.70m height. Thorough measurements and descriptions are given in his monograph, in which proportions were compared with those of other early modern human remains from the sites of Crô-Magnon and Cavillon. Sollas concludes: 'The man of Paviland represents the most westerly outpost of a race which is known to have extended to the east as far as Lautsch and Predmost in Moravia and from Belgium in the north through the Dordogne in France to the margin of the Mediterranean at Mentone.' (1913,47). The Red Lady is now preserved in Oxford, at the University Museum, as is the pendant, the bulk of the ivory and bone artefacts, and 3 600 lithic finds.

Sollas realised that he was digging in disturbed deposits, and that the site had indeed changed much since Buckland's day. The detrimental effects - to the deposit - of Paviland's fame are noted in a letter dated 26th October 1934, from Mrs Cunnington to Grimes: 'A party of school boys from Clifton School [Bristol] who spent a good many summer holidays at Rhossili did a good deal of digging in the cave... Years later, quite by chance we happened to be at Rhossili at the time when Professor Sollas was digging there. I think unknowingly he must have dug through a lot of the debris left by the boys... I think their exploits must have been in the early 1890s.' Grimes made enquiries as to finds which may have been taken to the school museum. R. C. Punnet, from the school and later Professor at Cambridge was contacted but the finds, if any, have never been located. I have been in contact with the current archivist at Clifton College, but a search for any reference to the exploration, or any surviving finds has not been fruitful.

Other people connected with Paviland include Mr. B. H. Cunnington who appears to have held a long standing interest in the cave. It was he who donated a large greensand chert flake to Cardiff Museum during 1898. Grimes wrote to the family for more

information about the artefact but little is known. T. C. Lethbridge, of Shelford, Cambridgeshire also had some involvement in compiling a collection 'found in spoil heaps from excavation and in unexplored corners' (1934). His assemblage numbers about a hundred flints and is now in the NMGW.

2.4: Investigations Since Sollas.

There have not been excavations on any scale since Sollas; the endeavours of collectors lessened with the reduced level of sediment and numbers of flints left in the cave. Paviland had been effectively mined out, and the excitement of discovery moved elsewhere. Excavations took place at a number of other sites which served to detail and revise a chronology relevant to Paviland. Dorothy Garrod, archaeologist and first female Professor at Cambridge, worked extensively both in Gibraltar and in Israel, at the Mount Carmel Caves. She published a book in 1926 which reviewed the British Upper Palaeolithic, and introduced the term Creswellian, albeit as a footnote on the last page (Garrod 1926,194).

Familiar with the French sequence, Garrod sought to associate the British finds, and in spite of 'scanty material' provided an overview of the main sites, and surface finds which is still useful today. However she retained the 'proto-Solutrean' for leaf points which she notes are 'atypical', and suggested that it substituted the true Solutrean industry in England and Wales. Garrod noted material from Kent's Cavern as being similar to that of Paviland, particularly scrapers with fluted, fan shaped retouch, and those in which retouch forms a concave excavation of the terminal edge.

L. Armstrong and G. A. Garfitt continued to dig at Creswell Crags (1924-1926), William Pengelly and E. Vivian at Kent's Cavern (1864-1880) and Sir William Boyd Dawkins at Wookey Hole (1859-1863). Gough's Cave, also part of Cheddar Gorge, was described in 1914 by Dr. Seligman and Professor Parsons.

Closer to Paviland, excavations at Hoyle's Mouth, Dyfed were being carried out by a number of people, including Boyd Dawkins, E. L. Jones and more recently in 1968 by Dr. H. N. Savory. For the most part, the industry is characteristically Upper Palaeolithic (Green and Walker 1991), but an Aurignacian busqué burin is known,

identified among the Tenby Museum collection by Andrew David (1990). Unfortunately there is no context for this implement, as it was picked up in one of the Victorian excavations.

The only other definite Aurignacian sites in Wales are that of Cae Gwyn, and Ffynnon Beuno (McBurney 1959). These two sites lie in very close proximity, and have traditionally been considered together. They are in North Wales, on the eastern side of the vale of Clwyd. The Aurignacian at Ffynnon Beuno is represented by a busqué burin and a leaf point; a dihedral burin was also found. Cae Gwyn produced an end-scraper only. The sites have a similar cold climate fauna (horse, rhinoceros, bear), and judging by the frequency of hyaena bones and the gnawed condition of other bones the faunal accumulation is the result of hyaena activity. The original excavators concluded that the sediments had been affected by water action; it is probable that deposits, and therefore finds were emplaced by some form of debris flow (Collcutt 1984).

In 1960, Denise de Sonneville-Bordes published her book *Le Paléolithique Supérieur en Périgord.* Its fourth chapter, following François Bordes and M. Bourgon, describes a standard statistical method to be used in the study of Upper Palaeolithic assemblages; including a list of 92 tool types and a method of comparison involving cumulative graphs. Type-fossils (*fossils-directeurs*) were also incorporated into the scheme; these are tool types which have a short and well-defined chronological existence within the wider development of a culture, and so can be used to date assemblages. For the French Upper Palaeolithic, de Sonneville-Bordes recognised the following artefacts as type fossils: Aurignacian bone and antler points, Noailles burins, Font Robert tanged points, shouldered and pressure-flaked Solutrean leaf points, stemmed points of the late Magdalenian, and Azilian antler harpoons.

Although there will always be an element of individual choice in assigning the standard nomenclature to a piece, de Sonneville-Bordes' typology has remained virtually unchanged. It is not used with every assemblage, again this being open to personal preference, but is widely approved; for example Henri Delporte used it in his monograph on the Upper Palaeolithic tools from the site of La Ferrassie (1984). The list has been

translated into English (M. Newcomer, unpublished) with only slight variations, and will be explained further in chapter 3 with reference to the Paviland collection.

Chapter 3.

Approaches to the Artefact Study

3.1: The State of Documentation.

To date, Paviland Cave has yielded a total of 4599 known pieces of stone tools and debitage, which are divided between the museum collections as shown in the table below.

Table 3.1: Paviland Collections.

	Number of Retouched Tools	Number of unretouched Pieces (debitage)	Number of Pieces on Display	Number of Pieces in Storage	Total
National Museums and Galleries of Wales, Cardiff	501	308	4	805	809
Swansea Museum	14	113	5	122	127
Oxford University Museum	67	3550	79	3538	3617
Ashmolean Museum	16	14	_	30	30
British Museum	3	9	_	12	12
The Manchester Museum	1	3	_	4	4
Total:	602	3997	88	4511	4599

By far the greatest number of retouched tools on display are in Oxford University Museum. There are red ochre stains on them, but there are also natural deposits of iron oxide in the cave wall limestone which, as at the nearby site of Bacon Hole, can be seen as red streams down the cave wall. In the circumstances, ochre from the 'Red Lady' burial cannot be regarded as the only reason for the staining.

Literary documentation of the site appears in two forms. First, there are many examples of amateur spelæological and geological investigations of the caves of Gower (Rutter & Allen 1948; Davies 1993). Secondly, there are major texts illustrating the pieces and attempting to construct a theoretical basis for the site in geographical and chronological context. The two most outstanding examples of these are Garrod's *The Upper Palaeolithic Age in Britain* (1926), and Campbell's work and gazetteer published in 1977. Grimes also, as mentioned above, took Paviland into consideration in his *The Prehistory of Wales* (1951).

3.2: Methodology.

There are three stages to this study, involving formulation of the attribute list and recording of the lithics, secondly tabulation and production of the catalogue, and finally statistical measurements concerning percentages of raw materials and retouched pieces. A comparison of the Paviland lithics with other finds from British sites will be given in Chapter 5.

During the first two months the site itself was visited twice, in addition to surrounding sites (Long Hole, Cat Hole). Archives in the Oxford University Museum, and Buxton Museum, connected with Sollas and William Boyd Dawkins were carefully searched for references to the main excavations at Paviland. If notes were taken at the time, these have not survived; and references to the site in private letters are minimal. There is some tantalising evidence of Sollas' excavations, for example on unattached labels giving the depths of groups of finds. Also the date at which a piece was found has been written on many pieces. Unfortunately these cannot be used to build up other than a very rough idea of archaeological succession, since as Sollas himself noted, (1913,339) the sediments were disturbed, and greatly mixed at the time of his exploration.

A list of attributes was drawn up which would permit flexible and efficient measurement of the tools, debitage, and 'lithological samples' (raw material blocks) from the cave, in all collections. These attributes, given below, were chosen with reference to standard types, in order to produce a list which would be comparative. The

information gained was used to compile a catalogue for the NMGW, and for the reference of other museums with Paviland collections.

Explanation of Attributes Used in Recording Variables.

1. Accession Number (Acc. No.): As on piece.

2. Previous Classification (Prev. Class.): As on piece, or finds bag.

3. Raw Material:
1= Flint
2= Chert
3= Rhyolite
4= Quartzite
5= Other

4. Abrasion:
0= No abrasion (i.e. fresh)
1= Slightly rolled
2= Extensive abrasion
3= Very worn

5. Patination:
0= No patination
1= Slight clouding (with flint) or pitting (with chert)
2= Deep patination
3= Burnt

6. Patina Class:
0= No patination
1= Mottled (with chert and rhyolite)
2= White Patina (on flint)
3= Beige Patina (on flint)
4= Other

7. Blank Type:

0= Indeterminate	
1= Struck flake	
2= Levallois flake	Following Bordes' criteria (1961 and 1980)
3= Blade	
4= Natural flake	Flake which appears to be removed by natural mechanical/ thermal fracture.

8. Blank/ Tool Shape: 0= Indeterminate

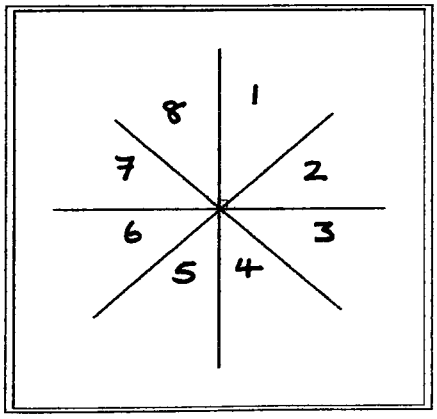
1= Convergent	(Maximum breadth at proximal end)
2= Intermediate	(Maximum breadth in middle third of the length)
3= Divergent	(Maximum breadth at distal end)
4= Parallel Sided	(<20° variation in edge direction along length of edge)
5= Waisted	(Minimum breadth in middle third of length)

9. Completeness: 0= Complete
1= Proximal end absent/ damaged
2= Distal end absent/ damaged
3= Proximal and distal ends absent/ damaged
4= Longitudinal break
5= Other (such as thermal removals or recent damage)

10. Edge Damage Extent: 0= No edge damage
1= Slight abrasion to edge
2= Extensive damage (>75%)

Edge damage is taken to mean chipping of the edges of the artefact through abrasion, due either to post-depositional factors *or* utilisation of the artefact as a tool. Although many workers discriminate between these two effects, especially if the piece is splintered or rounded; it is not possible to be absolutely certain if the damage caused to the majority of pieces is pre- or post-depositional.

11. Edge Damage Position: Indicated by stating the numbers of the 45° sectors in which damage occurs, preceded by 'D' if the damage is dorsal side only, and 'V' if the damage is ventral side only.
0= none
9= all areas
used in measuring variables **11** *and* **19**.



12. Edge Damage Type = Heavily rounded wear
= Crushing
= Chipping

13. Edge Continuity: 0= Discontinuous (if interrupted by patches of cortex)
1= Continuous along one side only
2= Continuous along both sides and above base
3= Continuous around sides and base

14. Edge Regularity: 0= Irregular (unworked, uneven and jagged)
1= Zig zag (worked - alternate flaking or denticulate)
2= Straight (neatly worked to an approximate straight line, or the straight edges of blades)

15. Edge Angle: 1= <20° acute (or retouche couvrante)
2= 20-45° regular (or retouche ordinaire)
3= 45-90° obtuse (or retouche abrupte)

16. Retouch Type: 0= No retouch present
1= scalar
2= semi-invasive stepped retouch (s-i s s)
3= invasive stepped scalar (Quina)
4= parallel
5= sub-parallel
6= denticulate
7= abrupt

17. Retouch Position (R. Position): 1= direct (retouch on dorsal surface)
2= inverse (retouch on ventral surface)
3= bifacial (retouch on both faces of the *same* edge)

18. Residual Cortex: 0= absent
1= <25% cortex present (small patch of cortex on dorsal)
2= <50% cortex present (less than half of dorsal side)
3= >50% cortex (more than half of dorsal side)

19. Residual Cortex Position: indicated by stating the numbers of the 45° sectors in which cortex remnants occur.

20. Cross-sectional Form: 0= indeterminate
1= irregular
2= globular
3= ovate/ lenticular
4= plano-convex
5= trihedral
6= wedge shaped
7= parallelogram

21. Termination:

0= indeterminate/ absent due to damage
1= normal/ feather (distal end is thin and sharp)
2= hinged (distal end is rounded/ blunt)
3= stepped (abrupt right angled fracture)
4= thickened (blank retains part of core or blank from which it was removed at distal end)

22. Platform Type:

0= absent due to damage/ deliberate removal
1= point of percussion only (no preparation)
2= plain (single flaked surface)
3= dihedral (remnants of two previous removals separated by a ridge)
4= flat facetted (remnants of several previous removals and flat surface)
5= convex facetted (remnants of several previous removals and convex surface)

23. Number of Dorsal Scars: This refers to the number of primary removals and does not include retouch scars.

24. Orientation of Primary Dorsal Removals:

0= indeterminate or absent
1= one simple
2= >1 same platform simple (removals made from a single platform)
3= >1 same platform parallel (removals made from a single platform which run parallel)
4= >1 same platform convergent (removals made from a single platform which converge at distal end)
5= including opposed scars (from a single continuous platform or opposed platforms)

25. Form of Ventral Surface:

1= normal or slightly convex
2= curled
3= plunging

26. Maximum Length (L) /mm: measured along flake axis. All dimensions are recorded in millimetres. Pebbles and cores are measured based on their maximum dimension, which is their length, with other measurements at 90° as above.

27. Maximum Breadth (B) /mm: measured at 90° to the length, in the same plane, at the broadest part of the piece.

28. Thickness (Th) /mm: maximum measurement of the piece (anywhere along its length), at 90° to both length and breadth.

29. Weight (W)/ g.

30: Tool Type: In accordance with D. de Sonneville-Bordes and Perrot (1960). However cores and single burins (not mentioned in the Upper Palaeolithic typology) will be recorded under separate numbers.

Publications in which pieces have been previously illustrated are referenced in the final column, with tool type. In the case of the Oxford pieces, previous illustrations are in a separate column. Publications referenced have been chosen either because they contain the original drawings of the implements, or are books in common use which are widely available. The key to the abbreviations used is as follows:

a = Sollas 1913. *Paviland Cave: An Aurignacian Station in Wales.*

b = Garrod 1926. *The Upper Palaeolithic Age in Britain.*

c = Sollas 1911. *Ancient Hunters.*

d = Campbell 1977. *The Upper Palaeolithic in Britain.*

e = Grimes 1951. *The Prehistory of Wales.*

f = Green & Walker 1991. *Ice Age Hunters.*

g = Green & Stanton 1984. *The Old and Middle Stone Ages, Glamorgan County History*

The lettering denoting publication title is followed by page or figure number in which the piece is mentioned or illustrated.

3.3: The Typology.

The typology chosen to be used in classifying the tools and debitage is that produced by D. de Sonneville-Bordes and J. Perrot in 1954, and also detailed in *Le Paléolithique Supérieur en Périgord* (1960). The English terms used are based on an unpublished translation by Dr. Mark Newcomer. The original typological scheme involved a 92 item type list which can be broken down into ten major groups:

1-16: end-scrapers
17-22: composite tools
23-26: borers
27-44: burins
45-59: backed tools
60-64: truncated pieces

65-68: retouched blades
69-72: Solutrean pieces
73-78: various pieces (and type fossils)
79-90: tools on bladelets
91: Azilian point
92: blade pointed by retouch
93: miscellaneous (including debitage

This *lexique typologique* has since been extended to 105 elements, but the original has been used for the Paviland study as the additional tool types are not present at the site. However, I have added two others, microlithic blade cores or flake cores(as number 106), in order to separate them from the debitage; and simple or single burins (as number 107). As expected, these are very common, but although undiagnostic as to precise date should not be overlooked.

In order to distinguish between a flake and a blade, on the one hand, and between a blade and bladelet on the other, a standard definition has been followed. Blades are flakes with a length at least two times greater than their width. They usually have parallel or near parallel straight sides and parallel flake scars on their exterior surface, indicating a technique of manufacture which differs from simple flaking. The distinction between blades and bladelets is based on absolute size: bladelets are smaller than 50 mm in length or 12 mm in width. The dimensions of measurement for each piece are defined above.

De Sonneville-Bordes' scheme is useful because it takes into account the numbers of unretouched pieces and debitage. Waste flakes and unretouched categories were not included in the original study, by Laplace 1958, although other studies have devised schemes for typologising this material, (Gamble 1986). They can, however, be criticised for over-complication, making it difficult to record a large amount of material and for an inability to characterise the complete industry.

In de Sonneville-Bordes' approach every artefact type has an equal weighting, and the type numbers are used to draw a cumulative graph in order to compare assemblage patterning between sites.

Type List for the Upper Palaeolithic. (After D. de Sonneville-Bordes, and J. Perrot. Translated by M. H. Newcomer)

1. **Single end-scraper (grattoir simple):** Blade or flake (blank) with continuous and non-abrupt retouch atone end, making a rounded front, more rarely straight or oblique.
2. **Atypical end-scraper (grattoir atypique):** Single end-scraper with irregular retouch.
3. **Double end-scraper (grattoir double):** End-scraper with two scraper fronts opposite each other.
4. **Ogival end-scraper (grattoir ogival):** End-scraper with a front in the shape of a broken arch.
5. **End-scraper on retouched blade or flake (grattoir sur lame ou éclat retouchée):** End-scraper with continuous retouch on one or both edges.
6. **End-scraper on Aurignacian blade (grattoir sur lame Aurignacienne):** End-scraper on a wide blade, with wide, often scaled retouch on one or both edges.
7. **Fan-shaped end-scraper (grattoir en eventail):** Short end-scraper with wide semi-circular front, sometimes with lamellar retouch, with narrow base which may be retouched.
8. **Flake end-scraper (grattoir sur éclat):** End-scraper on a wide flake of variable size, with a front which extends all the way around its periphery, excluding the butt which is always unretouched.
9. **Circular end-scraper (grattoir circulaire):** End-scraper on a circular flake, with scraper retouch around the total circumference.
10. **Thumb-nail end-scraper (grattoir unguiforme):** Small, short end-scraper in the form of a thumb-nail.
11. **Carinated end-scraper (grattoir caréné):** End-scraper made on a thick flake, having the profile of an inverted keel, the scraper front made by parallel (lamellar) retouch which may be wide and short or narrow and long.
12. **Aypical carinated end-scraper (grattoir caréné atypique):** Carinated end-scraper with wide and non-lamellar retouch or an irregular profile.

13. **Thick nosed end-scraper (Grattoir épais a museau):** End-scraper on a thick blade or flake with a nosed front made by retouch which is usually lamellar.
14. **Flat nosed end-scraper or shouldered end-scraper (grattoir plat à museau ou à épaulement):** End-scraper on a thin blank with a nosed front narrowed by retouch on one side (nosed end-scraper) or on only one side (shouldered end-scraper).
15. **Core-like end-scraper (grattoir nucléiforme):** End-scraper made on a core by regularisation of the striking platform.
16. **Thick core - scraper (rabot):** A core of prismatic shape, worked into an end-scraper by regularising one edge of the striking platform to form a straight or convex front with a vertical profile.
17. **End-scraper - burin (grattoir - burin):** Piece with any type of end scraper (1-15) associated with any type of burin (27-44)on the same blank.
18. **End-scraper - truncated blade (grattoir - lame tronquée):** Piece with any end-scraper (1-15) associated with any type of truncation (60-63) on the same blank.
19. **Burin - truncated blade (burin - lame tronquée):** Piece with any burin associated with any truncation on the same blank.
20. **Piercer - truncated blade (perçoir - lame tronquée):** Piece with any type of piercer (23-26) associated with any type of truncation on the same blank.
21. **Piercer - end-scraper (perçoir - grattoir):** Piece with any piercer associated with any type of end-scraper on the same blank.
22. **Piercer - burin (perçoir - burin):** Piece with any piercer associated with any type of burin on the same blade or flake.
23. **Piercer (perçoir):** Blank having a straight, offset or incurved pointed projection worked by bilateral sometimes alternate retouch, with a double or single shoulder.
24. **Atypical piercer or bec (perçoir atypique ou bec):** Blank with a thick or wide projection made by bilateral retouch.
25. **Multiple piercer or bec (perçoir ou bec multiple):** Blank having several piercers, becs or micropiercers, sometimes associated with notches.
26. **Micropiercer (microperçoir):** Piercer made on a bladelet or small flake.

27. **Dihedral straight burin (burin dièdre droit):** Blade or flake having a dihedral angle at one end formed by the intersection of two or more burin facets, the angle formed by each burin facet or facets with the axis of the piece being roughly equal.
28. **Offset dihedral burin (burin dièdre déjeté):** Burin with one of the facets or groups of facets being clearly more oblique to the axis of the piece than the other.
29. **Dihedral angle burin (burin dièdre d'angle):** Burin with one of the facets or groups of facets parallel to the axis of the piece, the other being perpendicular or slightly oblique to the axis of the piece.
30. **Burin on a break (burin d'angle sur cassure):** Burin with a facet or facets parallel to the axis of the piece, the other surface perpendicular or slightly oblique to the axis of the piece is a break.
31. **Multiple dihedral burin (burin multiple dièdre):** Piece having two or more type 27-30 burins on it.
32. **Busqué Burin:** Offset or angle dihedral burin in which the transverse part is generally formed by several burin facets which are convex in profile and stopped by a retouched notch. A busqué burin is said to be atypical if it has no stop notch.
33. **Parrot-beak burin (burin bec-de-perroquet):** Burin on a thin blank with a clearly convex truncation made by short and abrupt retouch. The burin facet forms a very acute angle with this truncation.
34. **Burin on straight retouched truncation (burin sur troncature retouchée droite):** Burin made on an abrupt retouched truncation which is straight and perpendicular to the axis of the piece.
35. **Burin on oblique retouched truncation (burin sur troncature retouchée oblique):** The truncation is straight and oblique to the axis of the piece.
36. **Burin on concave retouched truncation (burin sur troncature retouchée concave):** The truncation is either oblique or perpendicular to the axis of the piece and is concave.
37. **Burin on convex retouched truncation (burin sur troncature retouchée convexe):** The truncation is either oblique or perpendicular to the axis of the piece and is convex.

38. **Transverse burin on lateral preparation (burin transversal sur troncature laterale):** The burin facet or facets are perpendicular to the axis of the piece, abrupt lateral retouch taking the place of the preceding distal end truncations.
39. **Transverse burin on a notch (burin transversal sur encoche):** The burin facet or facets are perpendicular to the axis of the piecs, made against a lateral retouched notch.
40. **Multiple truncation burin (burin multiple sur troncature retouchée):** Piece having one or more type 34-39 burins on it.
41. **Multiple mixed burin (burin multiple mixte):** Piece having one or more type 27-30 dihedral burins and one or more type 34-39 truncation burins on it.
42. **Noailles burin (burin de Noailles):** Burin on retouched truncation, often multiple, made on a thin flake or blade of small or very small size. The burin facets are often stopped by a small notch.
43. **Core-like burin (burin nucléiform):** Dihedral or truncation burin with many burin facets resembling a core.
44. **Omitted -was 'flat faced burin' (burin plan). As this feature can occur on any burin type it is now noted for each type and a separate index of 'Flat' (Plan) burin facets made.**
45. **Abri Audi type backed knife (couteau à dos, type Abri Audi):** Flake or wide blade with curved backing, made by abrupt, more or less short retouch.
46. **Châtelperron knife or point (couteau ou pointe de Châtelperron):** Piece with acute, offset point made on either a short and thickset or long and slender blade, Has a curved, more or less thick blank made by abrupt retouch or occasionally abrupt retouch on an anvil.
47. **Atypical Châtelperron point (pointe de Châtelperron atypique):** Châtelperron point without continuous backing, or with point which is not offset.
48. **Gravette point (pointe de la Gravette):** Point with very acute tip, made on straight slender blade with straight or only slightly curved back, made by abrupt retouch.
49. **Atypical Gravette point (point de la Gravette atypique):** Gravette point with thin or partially retouched back.

50. **Microgravette:** Small Gravette point made either on a small blade, or more often on a bladelet.
51. **Truncated element (élément tronquée):** Blade with one edge backed with abrupt retouch, one or both ends having a retouched truncation. Usually rectangular in shape.
52. **Font-Yves point (Pointe de Font-Yves):** Point with short semi-abrupt retouch made on a small, thin and narrow blade or bladelet.
53. **Backed piece with a gibbosity (pièce gibbeuse à bord abattu):** Piece backed by abrupt retouch having a gibbosity or bump, which is probably produced accidentally.
54. **Fléchette:** Sub-lozenge leaf-shaped piece with short, abrupt sometimes alternate retouch generally on all edges.
55. **Tanged point (Pointe à soie):** Subtype: Perigordian or 'Font-Robert' tanged point: Point with a long axial tang made by abrupt or semi-abrupt retouch with a head either sub-lozenge shaped, triangular or rounded. The head often has invasive retouch, sometimes of Solutrean type, more rarely bifacial. If bifacial it is mainly on the distal tip.
56. **Perigordian shouldered point (point à cran Perigordienne, dite atypique):** Point with a single shoulder made by made by abrupt retouch. The dorsal surface of the piece may be partially covered with flat but non-Solutrean retouch.
57. **Shouldered piece (piece à cran):** Blade having a single shouldered tang more or less clearly made by abrupt or semi-abrupt retouch.
58. **Totally backed blade (lame à bord abattu total):** Unpointed blade with one or less often, two backed edges made by continuous, more or less abrupt retouch.
59. **Partially backed blade (lame à bord abattu partiel):** Unpointed blade with abrupt retouch on one part only of one or both edges.
60. **Straight truncation (pièce à troncature droite):** A blank having a truncation at one end made by abrupt, occasionally inverse retouch. The truncation is straight and perpendicular to the axis of the piece.
61. **Oblique truncation (pièce à troncature oblique):** The truncation is oblique to the axis of the piece.

62. **Concave truncation (pièce à troncature concave):** The truncation is concave.
63. **Convex truncation (pièce à troncature convexe):** The truncation is convex; may resemble and end-scraper, but the retouch is abrupt.
64. **Double truncation (pièce à double troncature ou bitronquée):** Blank having any type of retouched truncation at both ends. In rare cases these resemble large geometric pieces.
65. **Piece with continuous retouch on one edge (pièce à retouches continues sur un bord):** Blank with non abrupt, continuous retouch on one edge.
66. **Piece with continuous retouch on both edges (pièce à retouches continues sur les deux bords):** continuous non-abrupt, non Aurignacian retouch on both edges.
67. **Auriguacian blade (lame Aurignacienne):** Wide blade with wide scaled semi-abrupt ('Aurignacian') retouch on one or more often both edges. The distal end may take various forms but is generally retouched to a pointed or ogival shape.
68. **Notched or strangulated Aurignacian blade (lame Aurignacienne à encoche ou étranglement):** Aurignacian blade with wide notch more or less in the middle section of the blade, or with two opposed wide notches more or less in the middle section of the blade.
69. **Point à face plane:** Symmetrical or asymmetrical leaf-shaped piece with pointed tip or obtuse tip. Usually has flat, Solutrean retouch covering all parts of the dorsal surface.
70. **Laurel leaf (feuille de laurier):** Bifacial leaf-shaped point with symmetrical cross-section, made by flat bifacial flaking covering all or most of both surfaces. Usually made with soft hammer, sometimes regularised by pressure flaking.
71. **Willow leaf (feuille de saule):** Elongated leaf-shaped piece with plano-convex cross-section, retouched by pressure flaking on the dorsal surface, only rarely on the ventral surface.
72. **Solutrean shouldered point (pointe à cran typique Solutréenne):** Point with lateral shoulder and with flat and regular Solutrean pressure flaking which may be bifacial and complete, or unifacial and very incomplete.

73. **Pick (pic):** large piece with triangular or trapezoidal cross-section, with robust point sometimes dulled or battered by utilisation, often with thick globular base.
74. **Notched piece (pièce à encoche):** Blank with one or more non-contiguous retouched notches.
75. **Denticulate (pièce denticulée):** Blank with a series of small contiguous or nearly contiguous notches.
76. **Splintered piece (pièce esquillée):** Piece of variable shape but usually rectangular or square with splintering, sometimes bifacial on two or all sides, caused by violent percussion. Breuil's 'squamous flakes' fit into this category.
77. **Side-scraper (racloir):** Blank with continuous scraper retouch making straight, convex or concave edges. If on one edge: single side-scraper. If on two edges: double side-scraper.
78. **Raclette:** Flake or blade fragment of variable form, usually small and thin with sub-parallel faces, having continuous very short and abrupt retouch, generally on all edges.
79. **Pièces geometriques: triangle**
80. **Rectangle**
81. **Trapezium**
82. **Rhomb**
83. **Lunate (segment de cercle)**
84. **Truncated bladelet (lamelle tronquée):** Bladelet having at one or both ends truncations made by more or less abrupt retouch.
85. **Backed bladelet (lamelle à dos):** Pointed or unpointed bladelet with one edge totally or partially backed with abrupt retouch. Sometimes the edge opposite the backing is partially or totally retouched, but only rarely with abrupt retouch.
86. **Truncated backed bladelet (lamelle à dos tronquée):** Bladelet backed by abrupt retouch with one or rarely both ends being truncated.
87. **Denticulated backed bladelet (lamelle à dos denticulée):** Bladelet backed with abrupt retouch having on the edge opposite the backing, very small contiguous or nearly contiguous notches either all along the edge or on only one part of it.

88. **Denticulated bladelet (lamelle denticulée):** Bladelet having on one or both edges a series of contiguous or nearly contiguous notches, either all along the edges or one part only.
89. **Notched bladelet (lamelle à coche):** Bladelet with one or several notches, clearly separated from each other and placed variously around the edges.
90. **Dufour bladelet:** Bladelet frequently with curved profile, with fine continuous semi-abrupt retouch on one side only, or alternate on both edges.
91. **Azilian point:** Small point made on either a short and wide, or longer and more slender blade, with a curved (rarely straight) back made by abrupt retouch. The base is sometimes truncated.
92. **Blade pointed by retouch:** Blade with the distal end pointed by abrupt or semi-abrupt retouch on both edges, this retouch may or may not be continuous on both edges.
93. **Divers:** Any tool or fragment of a tool not referable to types 1-92. For the purpose of this study, this includes unretouched debitage.
94. **Bladelet with fine direct retouch** (Lamelle à fine retouche directe).
95. **Bladelet with fine inverse retouch** (Lamelle à fine retouche inverse).
96a. **Large segment** (Grand segment de cercle).
96b. **Malaurie Point.**
97. **Laurgerie Basse Point.**
98. **Teyjat Point.**
99. **Magdalenian Shouldered Point.**
100. **Hamburgian Point.**
101. **Pointed Blade.**
102. **Arenian Point.**
103. **Magdalenain Point/ bipointed blade.**
104. **Magdelanian blade with basal notch.**
105a. **Notch beneath break** (Encoche sous cassure).
105b. **Inversely retouched piece** (Pièce à retouche inverse).

106. **Core:** Large piece of raw material with blade or flake removals, not referable to types 1-92.

107. **Single burin (burin en bec de flûte):** Burin with one spall removed only, or two or more unconnected spalls.

3.4: Descriptions of the Raw Materials.

The raw materials dealt with in this study are of interest if only because the range of types is unusual, including typical flint of three types: grey-green, black and honey-coloured, fine grained and coarse grained cherts, and Ordovician volcanics (rhyolite). There seems to be a greater amount of chert than in the Kent's Cavern collections, and not as wide a variety of flint colourations. Flint may have been readily available on the English Channel Plain, to which Kent's Cavern was adjacent, but there may not have been a primary source as close in the case of Paviland. Some of the flint nodules from the latter site are either beach pebbles or from glacial outwash, and a high percentage of these show orange river gravel staining on the cortex, as well as 'chattermarks' (pitted lines resulting from pebbles colliding).

Campbell suggests that a higher angle of scraper retouch at Paviland than at Kent's Cavern might be partly accounted for by the greater use of chert in the manufacture of scrapers at Paviland. Campbell calculates too that a greater proportion of chert has been used at Paviland: 35% compared to 18% at Kent's Cavern (Campbell 1977), and this is not surprising considering that the raw material is local. The amount of flint used is still greater than chert at either site. On the other hand, it is particularly difficult to judge between human and natural breakage of the tabular or rough-grained chert, and there are no recognisable tools other than truncations on this material.

It is not possible to discern flint types in most cases owing to the deep white patination masking the natural colour of the piece. Sollas explored the process of patination in his monograph, firstly mentioning that 'at Paviland ammonia is present in the cave earth; when digging I was often surprised at the rich ammoniacal odour which filled the air; it is evolved from the animal matter of the bones which are still in course of decomposition.' (1913,357). Rather than from the bones and ivory, the odour probably

originated from bird guano, which would have the additional effect of phosphatizing the sediment and allowing good preservation of bones. Luedtke (1992) concurs, stating that colloidal silica is corroded by alkalis and that flint, being well preserved in acid soils, may be heavily patinated under calcareous conditions.

Apart from flint, it is also extremely difficult to provide a means of differentiation between the Carboniferous black cherts, and they seem indeed to form a continuum of texture, ranging from a material as high in quality as flint to a tabular coarse-grained stone resembling coal. The coarse-grained Carboniferous chert must have been a less appealing material for the manufacture of implements. It has a less predictable, planar fracture leaving a right angled rather than a feather termination and thus would not have provided as sharp an edge as the material which fractures conchoidally.

Some of the smooth, laminated, light grey chert has a structure comparable to that of 'fireclay', which is present both locally and in Monmouthshire. Typical light grey chert has been found at Porthcawl amongst the limestone Ffynnon Wen rock (Willan's Bed II), and is similar to some of the Paviland examples[1]. Sollas remarked that in thin slices under the microscope the black colour is found to be due to diffused transparent brown material 'doubtless carbonaceous'.

Some of the fine-grained opaque black material is speckled with small white dots, spread evenly throughout the piece: this has been matched with a volcanic agglomerate of Ordovician (Llanvian) age, sourced in Pembrokeshire - and is therefore not chert at all. Another raw material, about which there is some uncertainty, is represented by three pieces in the National Museums and Galleries of Wales collection[2]. It is a dark grey-green colour, fractures conchoidally, and is has a dull, glassy lustre. The pieces appear to have been derived from beach pebbles. It is impossible to tell whether they have been broken by human means, and they are not retouched. The natural raw material which this substance most resembles is Arran pitchstone (also found in Northern Ireland). Pitchstone is an impure obsidian, an igneous rock found on the island of Arran (Argyll) and in Northern Ireland, although there may be deposits in North Wales in glacial drift

[1] NMGW Acc. Nos. 24.94/355.44 and 24.94/355.60
[2] NMGW Acc. Nos. 50.406/23.7, 50.406/23.26 and 50.406/23.27

(Chambers, pers. comm.) The accession year of these pieces is 1950, raising a question about samples collected in the vicinity of Paviland Cave, which may have been ship's ballast dumped in the sea and washed ashore. Slag from steel working is a man-made form of the same siliceous substance, so similar that it is impossible to distinguish between them without a detailed, and unfortunately destructive analysis.

Despite the uncertainty all cherts have been grouped together. However it should be borne in mind that Greensand chert may have originated as far away as Somerset, whereas black Carboniferous chert is present locally in the Gower limestone. Definitions of the groups used in this study are given below:

Chert This is more of an archaeologist's grouping than the geologist's. Nevertheless, it can be taken to mean a hard, extremely dense or compact dull to semi-vitreous microcrystalline or cryptocrystalline sedimentary rock. Cherts consist dominantly of interlocking crystals of quartz less than about 30 μm diameter. They may contain amorphous silica (opal) and impurities such as calcite, iron oxide and micro-fossils; and occur as beds, nodular masses or veins in sedimentary rocks. They have a splintery conchoidal fracture and may be variously coloured. 'Chert', geologically, is a term which includes flint, as are the terms hornstone and silexite (Bates and Jackson 1980).

Flint This is a variety of chert which originates in the Upper Cretaceous chalk. It is characteristically homogenous, semi-transparent black and breaks with a conchoidal fracture, but may also be partly or wholly white to grey with a flat fracture. An outer chalky 'crust' of incompletely sicilified chalk is present on fresh specimens but is rapidly lost on reworking. It is also common to find a weathered zone inside the crust termed a 'cortex' and this forms by the same process as the 'patina' on flint artefacts (Clayton in Green 1984a,186).

Rhyolite In a publication produced by the Tenby Museum, Leach (1918,4) describes 'adinole' from the Hoyle Caves as 'dark green stone' and material of 'a dull green colour with whitish spots'. W. Boyd Dawkins in *Cave Hunting* (1874,289) refers to these as 'hornstone'. Adinole as a geological term refers to a unique and complex

process, that of the albitisation of slate (E. Jenkins pers. comm. August 1997). The identification of albitised slate is virtually impossible if the specimen is not in situ.

'Hornstone' is an unspecific geological term; and other than Campbell's use of the word 'adinole' as a Cambrian shale (1977,144), it seems in this case to be a regional name which has been used to refer to many varieties of raw material.

In this study, pieces classed as adinole were compared with geological samples in the NMGW, in an attempt to find a more satisfactory nomenclature. The material was most similar to a volcanic rock, rhyolite; sourced at Pen Anglas, Pembrokeshire[3]. The white specks in this pale grey-green semi-opaque stone may be felspar as in sphenulitic obsidian (volcanic), but they are not generally found in a sedimentary material. The fact that rhyolite is a relatively local stone (but, even so, would not occur *in situ* nearer than 40 km) accords with the observation that it is common at Paviland, and also present in pieces of a large size.

Greensand Chert A large, 'proto-Levallois' flake of Greensand chert is known[4]. Greensand chert originates in the Devon/ Somerset area, particularly the Blackdown Hills. The Greensand lithostratigraphic unit was deposited in the Cretacous period (Whitten & Brooks 1972,217). It is an extremely variable material both in colour and grain size, but in this collection is recognised as having an opaque white or pink-brown matrix with glauconite nodules (potassium silicate) dispersed through it, being soapy to the touch. It has been used to make only about 9% of the artefacts (Campbell 1977).

The source of the specimens of ochre (red iron oxide) from the cave can also probably be identified. Sources for non-haematitic ochre include High Meadow Mine, and Clearwater Mine near Hereford. It is present to some extent in the cave itself, and may have been more available during the time of occupation. However, some of the ochre collected by Sollas includes haematite ('kidney ore'), and this is not as likely to have originated within the cave. Possible sources of non-flint lithic raw material are listed below. The numbers in brackets are NMGW Geology Department reference

[3]NMGW comparative geological collection specimen number 78.20GR853
[4] NMGW Accession Number 98.18. Illustrated by Grimes 1939, 2-3; Lacaille 1954, 67.

numbers, with which specimens, on the basis of macroscopic examination, it is thought that the Paviland raw materials compare most closely.

1. Fireclay: Kilmarnock Level Coal Measures (Carboniferous), Tredegar, Monmouthshire. (78.20CR4492)
2. 'Adinole': Volcanic (Rhyolite). Above Pen Anglas Goodwick, Pembrokeshire. 78.20GR853
3. Black chert: Volcanic Agglomerate. Ordovician (Llanvian) volcanics. Carn Llwyd Pembrokeshire. 78.20GR723/ 78.20GR716
4. ?Pitchstone: Arran, Brodick Pier, 78.20GR5497
5. Grey chert: From surface of Willan's Bed II of limestone Ffynon Wen rock, Porthcawl, Glam. Willan 7820GR3816
6. Red Ochre: Clearwell Mine, south-east Monmouth. Iron Ore mine.

Chapter 4.
Analysis of the Artefacts.

4.1: Introduction.

Appendices II-IX present a catalogue of all the Paviland lithics in the five known museum collections. For ease of reference only the most relevant measurements (as described in Chapter 3) have been included. Pieces are listed three times: first by museum and museum accession number (Appendices II-VII). A second list is organised under tool type (the classifications are explained in section 3.3) to facilitate the counting and grouping of similar implements in case of further, more specific study (Appendix VIII). Finally diagnostic artefacts have been selected from the lists, and these are ordered by possible age (Appendix IX); in this way a picture of the density of occupation at Paviland throughout the Palaeolithic can be presented. Four publications in which pieces have been illustrated are referred to; these pieces have been marked with an asterisk (*) and an explanation of coding used is given in section 3.2.

In this section, four tables follow, in order to summarise information on the Paviland lithics which could not easily be include in the catalogue:

4.1: **Debitage:** waste material from knapping, separated from retouched tools by Sollas and stored separately in the Oxford University Museum. This has been measured by weight per bag, and detailed measurements of individual pieces have not been taken. Retouched material from this part of the collection has been noted where discovered.

4.2: **Lithological Samples:** collected by Sollas and referred to in his monograph as 'minerals' (1913,353). However, these show no evidence of human modification and occur naturally on the Gower peninsula, therefore they cannot be considered part of the worked stone collection. They are housed in the Oxford University Museum.

4.3: **Grey-green Flint:** debitage and tools attributed to Sollas' excavations at Paviland but which, on the basis of lack of patination and wear, is not thought to have

come from the site.It is probably from a Neolithic site (Dr. R. Jacobi pers. comm.).

4.4: **Pieces Without Accession Numbers:** these have been described, where possible by other markings. The pieces lack accession numbers which have either rubbed off through handling, or have not been included as the piece is part of a group accession under the same number (as at Swansea Museum).

TABLE 4.1:
Debitage from the 1913 Excavations (Stored in the Oxford University Museum)

BOX NO.	BAG NO.	TOTAL NO. PIECES	NO. RETOUCHED	NO. FLINT	WEIGHT FLINT/g.	NO. CHERT	WEIGHT CHERT/g.	NO. ADINOLE	WEIGHT ADINOLE/g.	NO. OTHER	WEIGHT OTHER/g.
1	1	225	2	181 (some ochre stained)	369	41	129.1	3	6	–	–
1	2	202	0	137	273.3	56	208.5	9	38.5	–	–
1	3	98	0	76	118.4	20	67.1	2	1.3	–	–
1	4	260	0	197	351.9	58	190.1	5	13.7	–	–
1	10	31	0	30	23.2	1	1.2	–	–	–	–
1	15	79	0	61	114.7	18	39.9	–	–	–	–
1	17	1 (burin spall)	0	1	0.6	–	–	–	–	–	–
2	1	73	0	56	122.9	12	48.9	5	20.6	–	–
2	2	24 (all blades)	1	21	54.7	2	2.9	2	7.1	–	–
2	3	55	0	44	125.2	10	64.4	–	–	1	1.3
2	4	69	1	51	144.6	11	32.8	7	14.5	–	–
2	5	33	0	24	81.2	8	52.1	1	5.7	–	–
2	6	65	0	36	109.6	22	93	7	29.4	–	–
2	7	64	0	43	89.9	20	108.9	1	20.1	–	–
2	8	79	0	60	179.4	17	109.3	2	1.6	–	–
2	9	147	0	98	350.1	36	154.5	13	44.1	–	–
2	10	133	0	88	320.2	33	146.2	12	52.1	–	–
2	11	114	1	91	326.7	24	167.4	8	82	1	22.4
2	12	92	0	69	290.8	17	140.4	6	29.3	–	–
3	1	18	0	18	183	–	–	–	–	–	–
3	2	51	5	12 (one burnt)	38.5	33	187.5	6	17.4	–	–
3	3	20	2	20	60.1	–	–	–	–	–	–
3	4	9	0	4	27.4	4	26.4	1	7.2	–	–
3	5	30	0	22	240.7	6	35.6	1	2.8	1	10.9
3	6	36	0	18	162.5	15	181.5	–	–	3	46.8
3	7	37	0	19	178.7	17	199.9	–	–	1	9.8
3	8	24	0	13	274.2	10	290.1	–	–	1	0.8
3	9	46	0	19	274.8	17	102.5	–	–	10	223.2
3	10	71	0	39	321.2	25	251	2	2.5	5	32.6
3	11	76	0	34	257.7	33	348.7	2	22.7	7	101.9
3	12	63	1 (burin)	34	333.6	20	214.4	–	–	9	115.5
4	1	217	1	136	390.1	73	201	8	24	–	–
4	2	195	0	187	282.6	34	88.6	4	7.8	–	–
4	3	92	0	–	–	82	572.3	10	46.8	–	–
4	4	207	1	175	262.2	21	49	11	45.9	–	–
4	5	188	8	92	346.2	85	328.1	11	30.3	1	3.7
4	7	51	0	48	191.5	3	18.4	–	–	–	–
4	8	1	0	–	–	1	1.6	–	–	–	–
4	9	68	0	36	210.8	31	261.5	1	4.2	3	74.5
4	10	58	1	24	212.1	29	304	2	19.9	–	–
4	11	63	–	37	102.5	25	85.5	1	0.8	1 (quartzite)	0.5
4	12	118	0	73	278.6	42	163.1	3	8.5	–	–
4	13	28	1	20	116	8	129.7	–	–	–	–
4	14	2	0	1	0.1	–	–	1	0.5	–	–
TOTALS (Nos):		3588	24	2252	8191.5	1020	5797.1	147	607.3	43	643.9
TOTALS (%):		100	0.67	62.8	53.8	28.4	38.0	4.10	4.0	1.2	4.2

TABLE 4.2:
Lithological Samples (Stored in the Oxford University Museum).

OXFORD ACCESSION NUMBER	RAW MATERIAL TYPE
S.5101	coal (lignite)
S.5102	coal (lignite)
S.5103	iron slag/iron ore
S.5105	broken red beach pebble
S.5109	iron slag/iron ore
S.5110	broken black beach pebble
S.5111	rough grained green rhyolite
S.5112	broken burnt pebble
S.5114	rough grained green rhyolite
S.5115	rounded red broken pebble
S.5116	round red beach pebble
S.5117	iron oxide and limestone
S.5118	rounded green pebble with inclusions
S.5113	rounded black pebble

TABLE 4.3:
Grey-green flint tools included in the Paviland Collection (Oxford University Museum) but probably not from the site.

REF. NO.	MATERIAL	PATINATION	RETOUCH TYPE	R. POSITION	PLATFORM TYPE	L/mm	W/mm	Th/mm	W/g.	TYPE
1	flint	none	sub-parallel	direct	dihedral	65	51	18	70.8	8
2	flint	none	sub-parallel	direct	dihedral	34	13	7	2.8	2
3	flint	none	scalar	direct	plain	66	23	6	10.4	14
4	flint	none	scalar	inverse	plain	48	21	6	5.9	93
5	flint	none	scalar	inverse	plain	43	30	9	8.3	93
6	flint	none	scalar	direct	plain	39	29	6	8.8	93
7	flint	slight patination	scalar	direct	dihedral	45	21	10	7.3	93
9	flint	deep patination	scalar	inverse	absent	37	19	3	3.6	65
10	flint	deep patination	scalar	direct	absent	52	30	9	13.7	65
11	flint	none	scalar	direct	plain	26	19	6	4.7	65
12	flint	none	scalar	direct	absent	46	22	6	8.3	24
13	flint	none	scalar	direct	absent	45	14	8	5.2	65
14	flint	none	scalar	direct	absent	30	16	3	2.5	66

Grey-green flint debitage included in the Paviland Collection (Oxford University Museum) but probably not from the site.

BOX NUMBER	BAG NUMBER	TOTAL NO. PIECES	NO. FLINT	WEIGHT FLINT	NO. CHERT	WEIGHT CHERT	NO. OTHER	WEIGHT OTHER
1	5	37	37	218.2	–	–	–	–
1	6	23	23	131.7	–	–	–	–
1	7	50	50 (1 burnt)	267.1	–	–	–	–
1	8	50	50	316.6	–	–	–	–
1	9	52	52	170.9	–	–	–	–
1	11	50	50	175.5	–	–	–	–
1	12	50	50 (1 burnt)	280.5	–	–	–	–
1	13	51	51 (1 burnt)	307.3	–	–	–	–
1	14	77	76 (3 burnt)	324.7	1	1.2	–	–
1	18	30	10	561.6	10	583.6	10	614.1

TABLE 4.4:
Pieces from Paviland (Stored in Swansea Museum), without visible accession numbers

1909- Vivian Collection: Debitage pieces

MATERIAL	NUMBER	COLLECTIVE WEIGHT /g.
Flint (1):	78	180
Fine Grained Carboniferous Chert (2):	6	40
Greensand Chert (2):	2	18
Adinole (3):	2	28
Total:	88	266

A836.1.x 1836 Francis and Geffries Collection: Glued to board.

TYPE	TYPE NUMBER	NO. TYPE IN COLLECTION	MATERIAL	REFERENCE ON PIECE	PREVIOUS CLASSIFICATION
core	94	3	flint		
undiagnostic flakes	93	4	flint		
unretouched blades	93	5	flint		
endscraper on retouched blade	5	1	flint	836.1.16	blade endscraper
simple burin	95	5	flint		
dihedral burin	27	1	flint		
simple burin on retouched piece	66	1	flint		
endscraper-burin	17	1	flint	836.1.22	graver/ round scaper with opposed point
endscraper on unretouched blade	1	1	flint	A909.1.10	
oblique truncation	61	1	flint	"7"	
concave truncation	62	1	flint	"9"	
unretouched blade	93	1	greensand chert		
unretouched blade	93	3	black chert		
atypical endscraper	2	1	black chert	35mm length	
undiagnostic flakes	93	2	black chert	35mm length	
bifacially retouched piece/ disc core	93	1	black chert	"Pavisland Dec 1914"	
core	93	1	black chert		
unretouched blade	93	1	adinole		
	Total:	34			

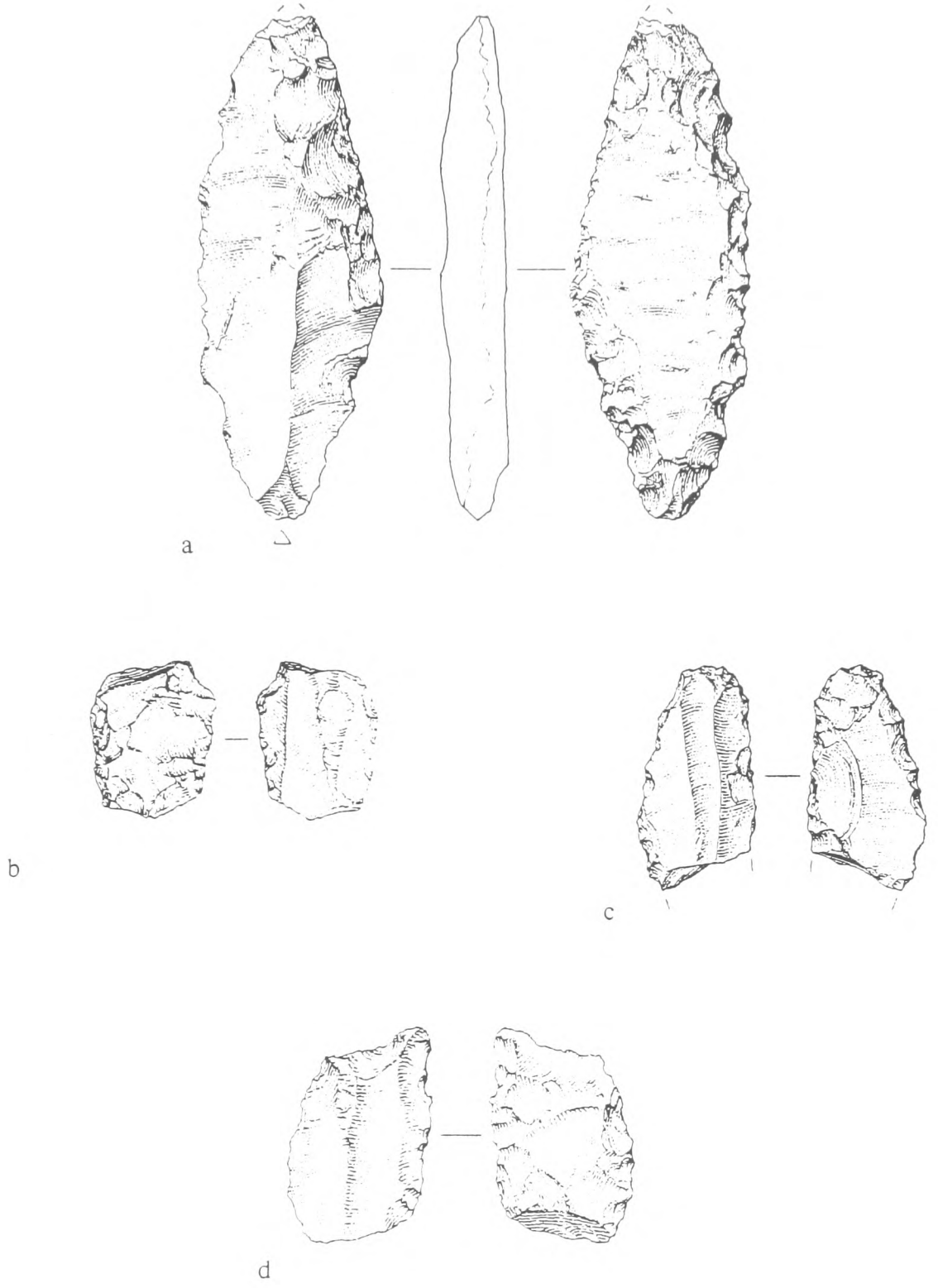


Fig. 4.1: a *blade point*; b-d *blade point fragments*. Scale 1:1.

Drawn by J. Wallis 1999

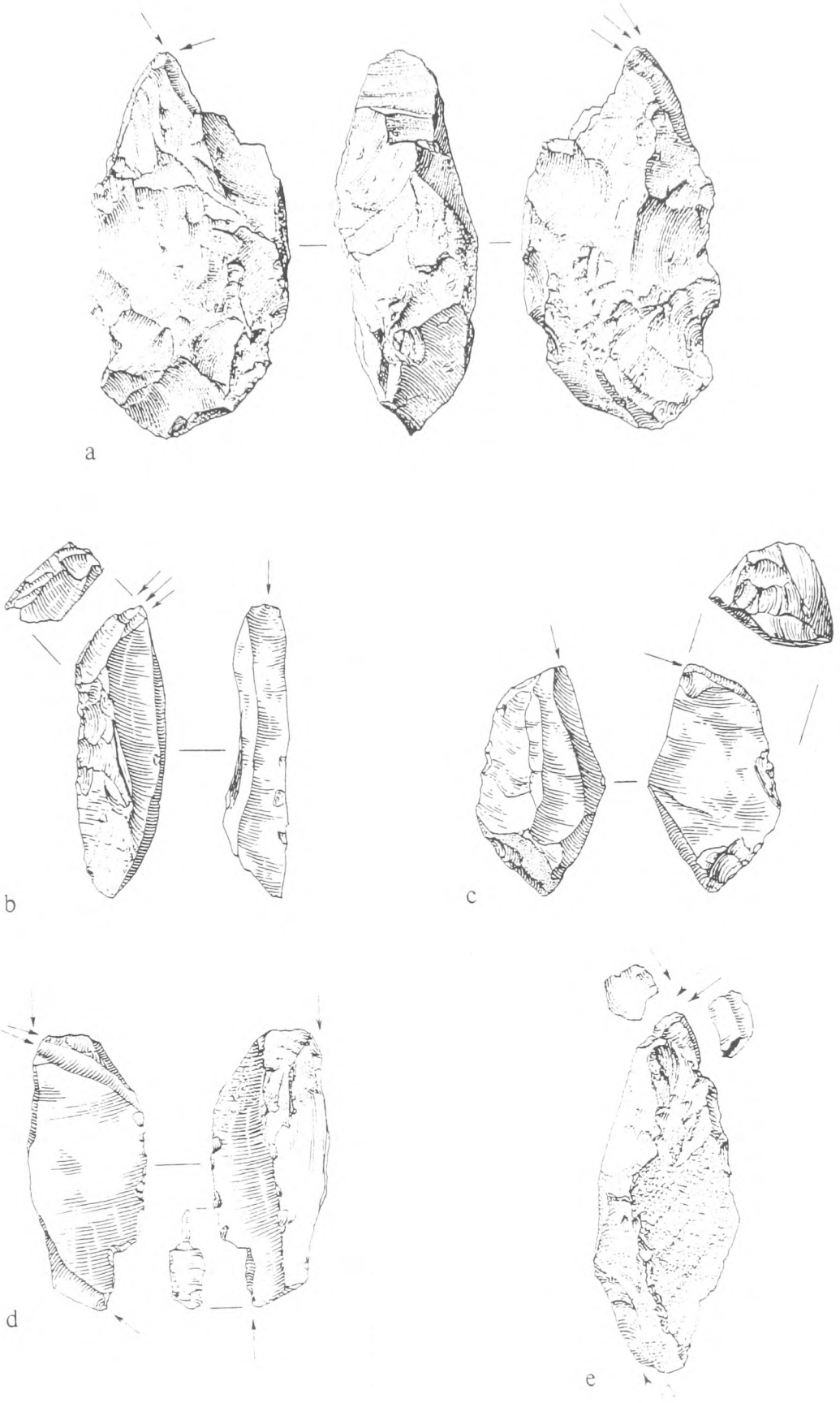


Fig. 4.2: a-c *busqué burins*; d *atypical busqué burin*; e *busqué burin on crested blade*.
Scale 1:1.

Drawn by J. Wallis 1999

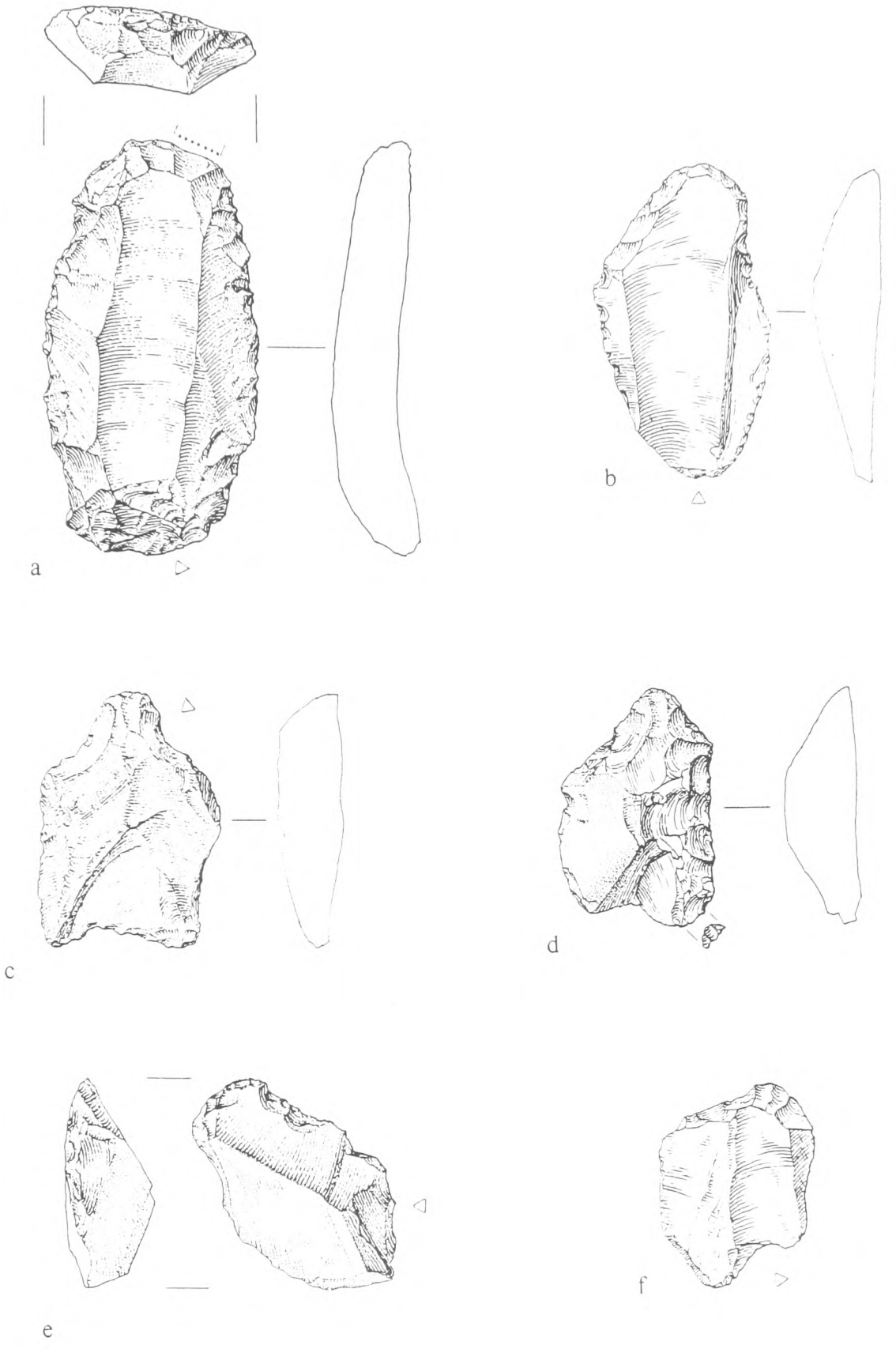


Fig. 4.3: a *end-scraper on Aurignacian blade*; b-e *nosed end-scrapers*; f *shouldered end-scraper*. Scale 1:1.

Drawn by J. Wallis 1999

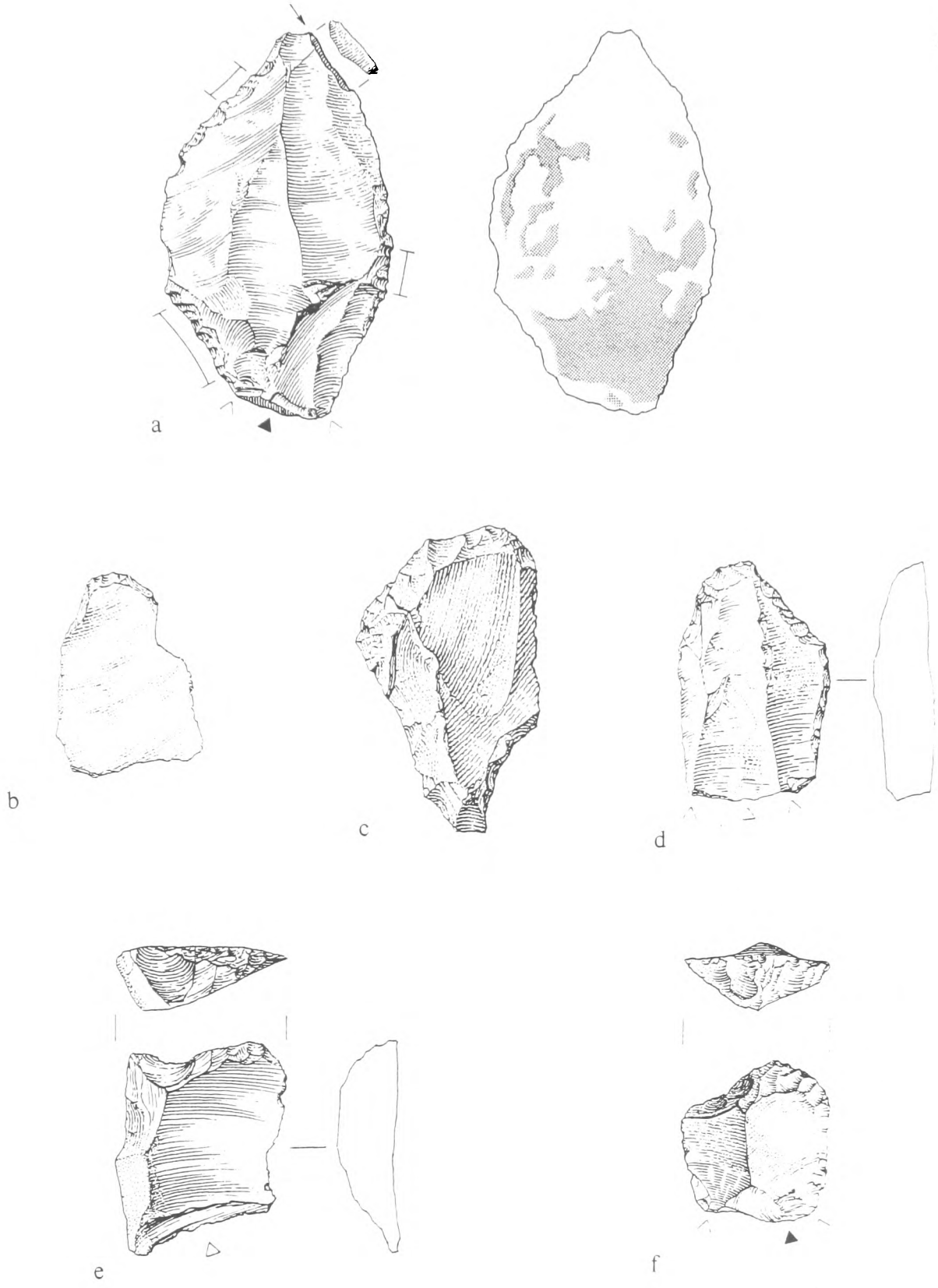


Fig. 4.4: a *utilised flake with red ochre stain (stained areas stippled)*; b-d *nosed end-scrapers*; e, f *concave end-scrapers*. Scale 1:1.

Drawn by J. Wallis 1999

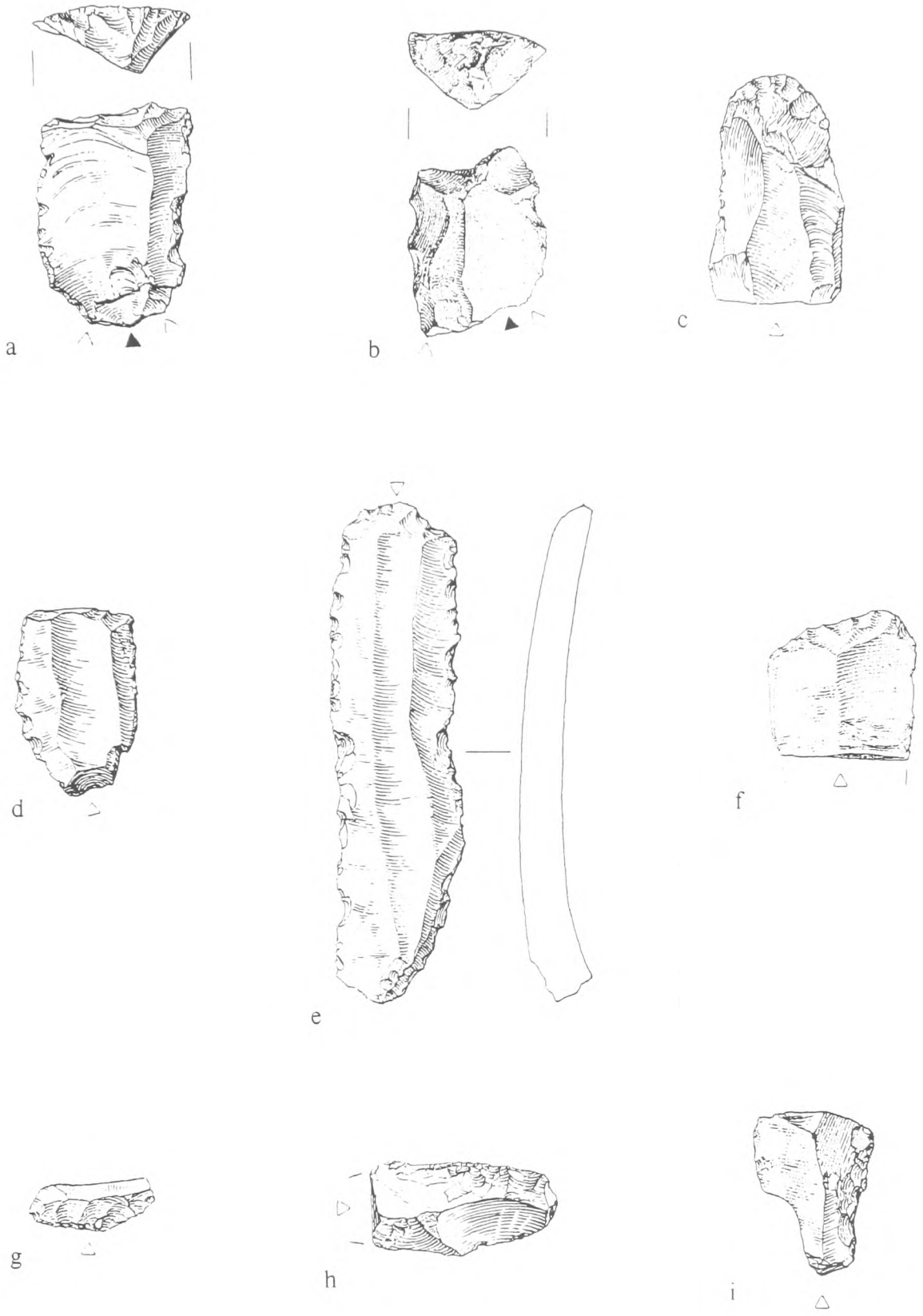


Fig. 4.5: a, b *atypical end-scrapers*; c *end-scraper on core-tablet*; d *atypical end-scraper*; e, f *end-scrapers*; g *retouch flake*; h *crested blade with secondary retouch*; i *retouched piece*. Scale 1:1.

Drawn by J. Wallis 1999

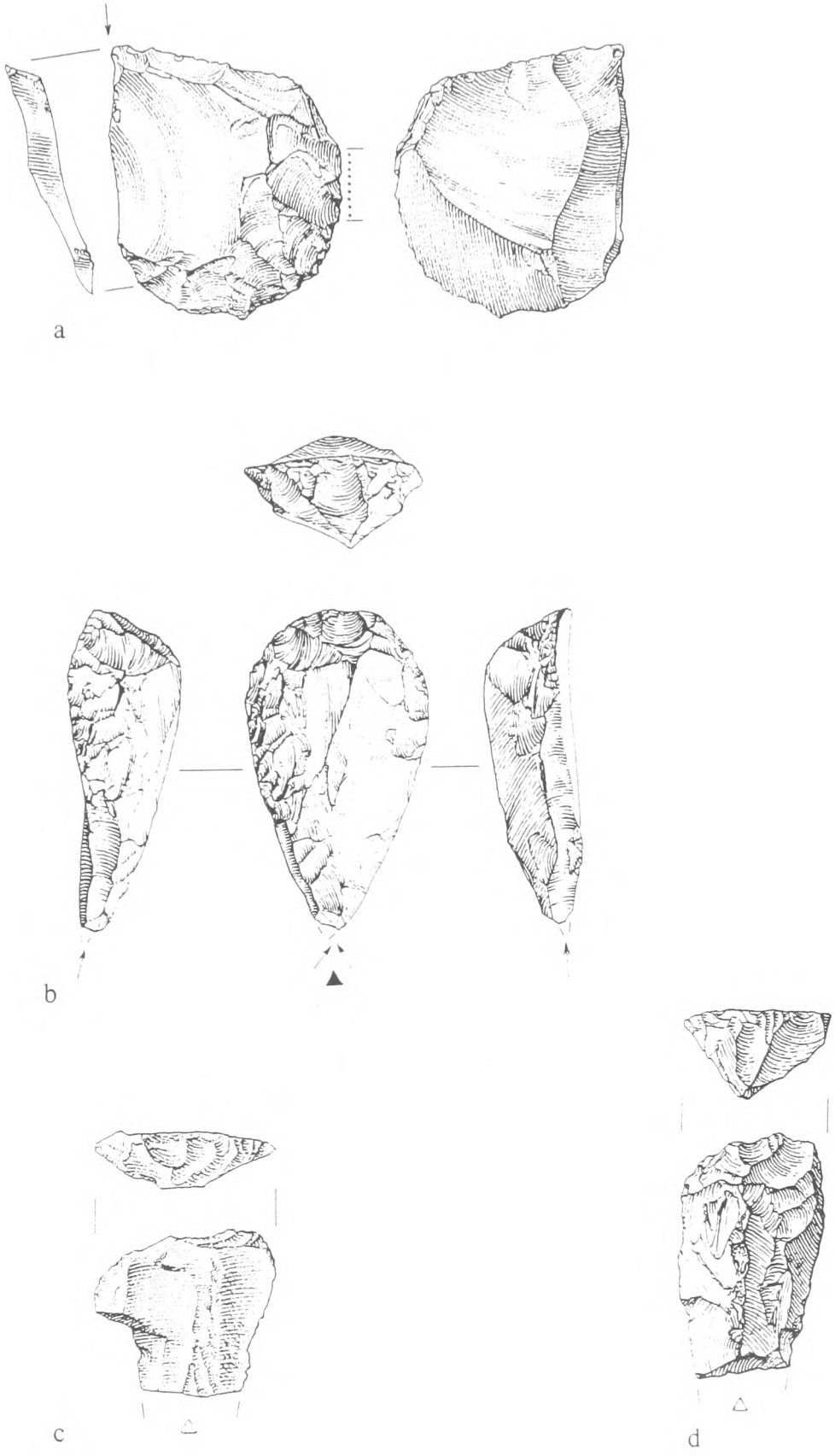


Fig. 4.6: a *scraper - burin*; b *end-scraper - burin*; c *atypical end-scraper*; d *end-scraper on crested blade*. Scale 1:1.

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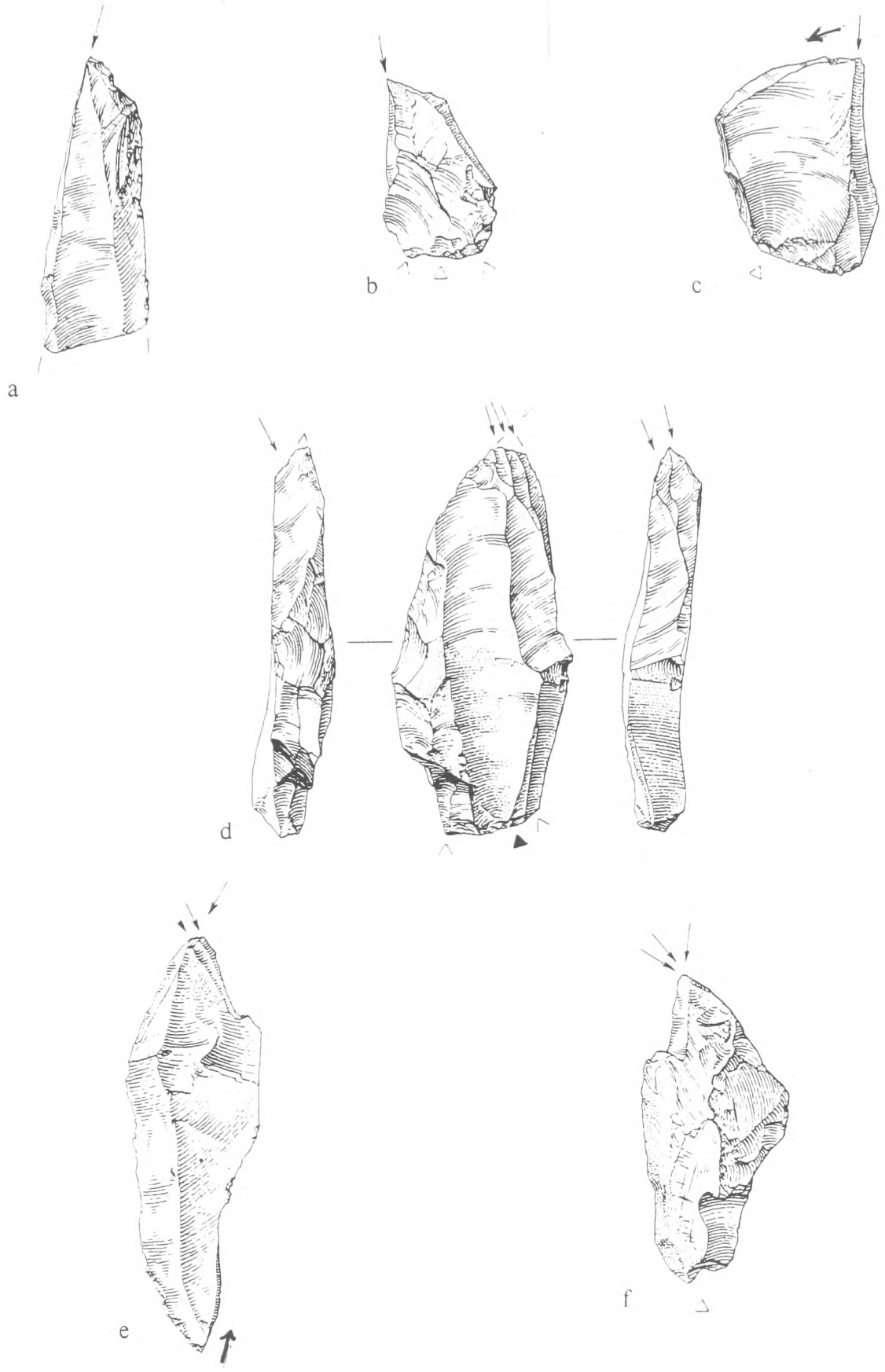

Fig. 4.7: a *burin on oblique truncation*; b *single burin*; c *dihedral burin on core tablet*; d, e *dihedral burins*; f *dihedral burin on crested blade*. Scale 1:1.

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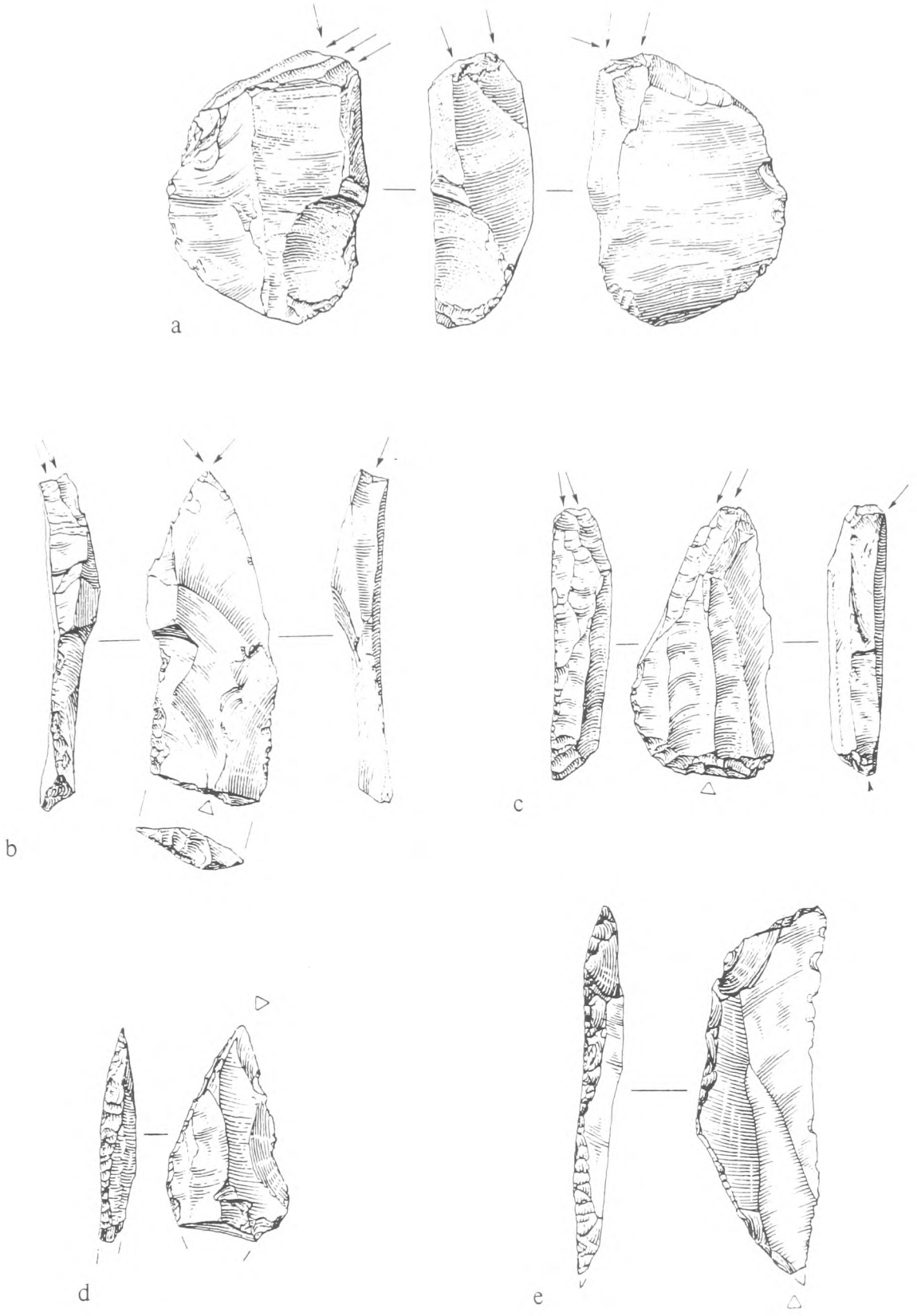

Fig. 4.8: a *dihedral burin (?busqué burin)*; b *dihedral burin*; c *endscraper-burin*; d *Creswell point*; e *Cheddar point*. Scale 1:1 a-c, 2:1 d, e.

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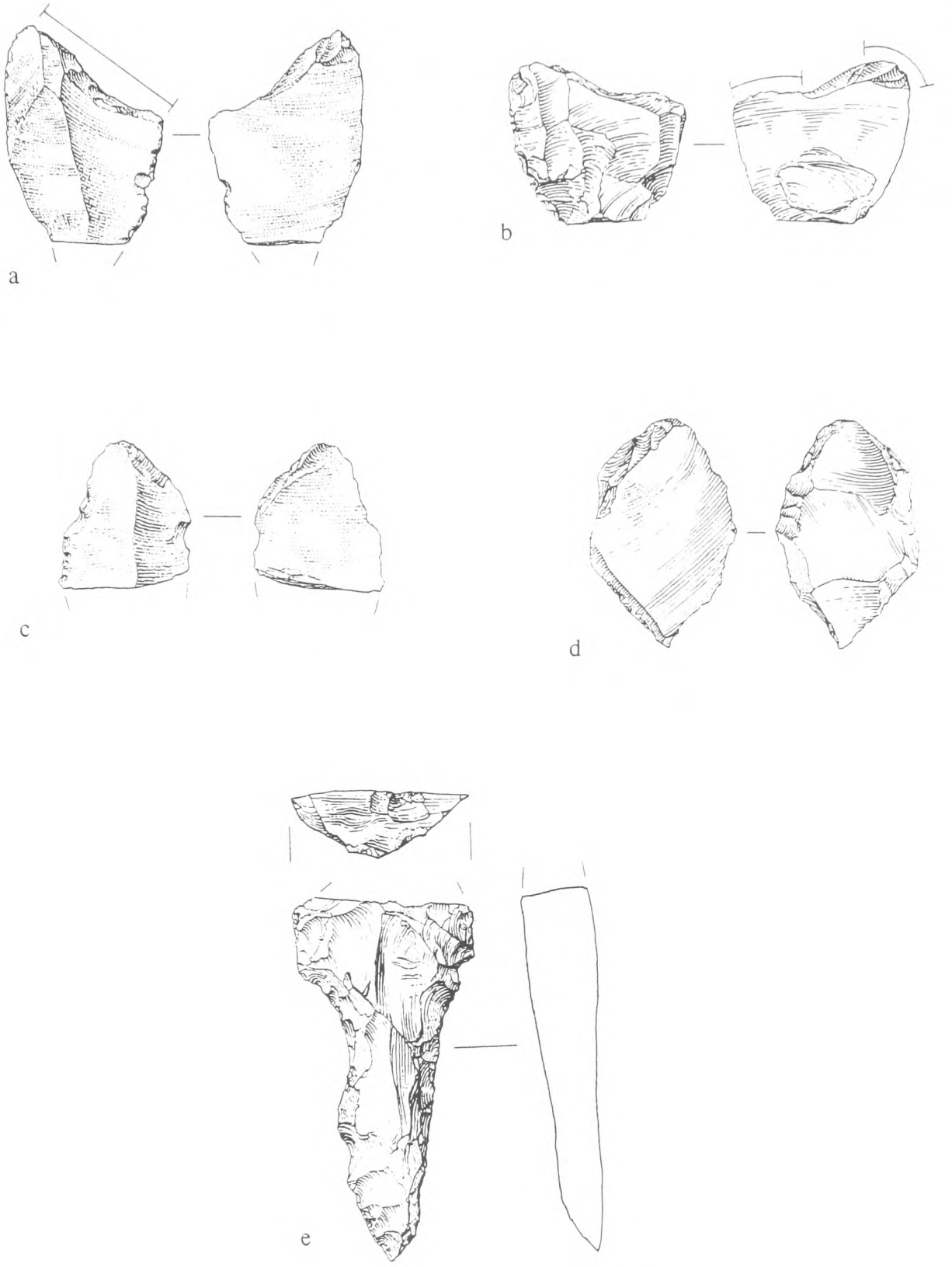

Fig. 4.9: a, b *shouldered end-scrapers with inverse retouch*;
c, d *pieces with inverse retouch*; e *tang of Font Robert point*. Scale 1:1.

Drawn by J. Wallis 1999

Chapter 5.

Interpretation.

5.1: Industries Present.

The catalogue 'List by Age of Artefacts' given in the preceding chapter itemises all the lithic pieces which can be assigned to industries on the basis of typology. Since there are no such pieces associated with absolute dates it is impossible to give a finer age estimate, although human presence may be noted at 29 600 BP, 26 300 BP and 23 600 BP on the basis of ^{14}C determinations, respectively on burnt bone, the 'Red Lady' and a bone spatula. At first glance the date range for individual industries appears vast and we might despair of ever being able to extract behavioural information from a palimpsest covering such a large time span.

By 'industries' is meant chronologically restricted groups of tools which include archaeologically recognised types (type-fossils or *fossils-directeurs*). They are usually expected to occur in different layers of a site and are often interpreted as different cultures. However a cultural group in archaeological terms may not equate with a separate society in the past. Other explanations include functional considerations and poor stratigraphy leading to inaccurate groupings. Groupings are constantly being revised and the implications for geographical and temporal extent of past societies also change.

The date on which a piece was found has been written on the backs of flints from Sollas' excavation, so for example inversely retouched nosed scrapers J14[1] (July 14th) and J10[2] (July 10th) may have been found close together in the cave, as work progressed during that month. However we cannot tell how the trenches were dug; in what spatial sequence and with what rapidity, so any contextual association between similar pieces is conjecture only. A leaf point fragment is dated Jn8 (June 8th), so could presumably have been found above the nosed scrapers in mixed sediment. However, the orange-stained Mousterian 'disc core' is dated Jn6, and another Mousterian piece[3] is dated to D15

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[1] NMGW Acc. No. 24.94/146
[2] NMGW Acc. No. 24.94/145
[3] NMGW Acc. No. 24.94/39

(December 15th?). A Late Upper Palaeolithic blade[4] is dated Jn7; so it is evident that unfortunately this method cannot be used to place the finds in a meaningful sequence.

If a cumulative graph is drawn (Fig. 5.12), making use of the numerical scheme devised by de Sonneville-Bordes and Perrot (1960), and given in chapter 3, the relative frequencies of different classes of tool types can be compared. It is not suggested that the cumulative graph represents a single industry to be compared with well-stratigraphically documented industries, for example the Perigordian VI assemblage of Level III in the Abri Pataud (Bricker & David 1984,7). There are remains of various industries included in the graph, but this does serve the purpose of allowing relative numbers of tool types to be assessed at a glance.

Unretouched debitage is not included in the cumulative graph, neither are the miscellaneous slightly modified blades or flakes which are not retouched enough or in a sufficiently patterned manner to be assigned to one of the recognised tool categories. Core and hammer stones are also not shown; but the graph does include tools made on raw materials other than flint.

A well-defined group of idiosyncratic tool types can be observed in the collections, and these are described in section 5.3. Apart from these, the industries present at Paviland which accord with British chronological groups are Mousterian, the leaf point phase, Aurignacian and Font Robert phases of the Early Upper Palaeolithic, the Creswellian and Federmesser phases of the Late Upper Palaeolithic and the late Mesolithic. Early Mesolithic, and Neolithic/ Bronze Age flakes may be present, but indistinguishable.

[4] NMGW Acc. No. 24.94 292

Table 5.1: Industries Present. (Dates shown are in radiocarbon years).

INDUSTRY	DIAGNOSTIC IMPLEMENTS	NUMBER OF IMPLEMENTS	OCCUPATION DATES (APPROX.)/ Kyr BP	POSSIBLY RELEVANT ABSOLUTE DATES (^{14}C)
Mousterian	disc cores	4	500-230	–
Leaf point phase	leaf points	7	38-28	38 800 (OxA-140)
Aurignacian II	busqué burins, carinated scrapers, shouldered scrapers, Aurignacian blade	49	33-28	29 600 (OxA-365)
Upper Perigordian	Font Robert point	1	28-24	23 670 (OxA-1790), 26 350 (OxA-1815), 28 000 (OxA-365), 27 600 (BM-1367)
Creswellian	angle backed blades, trapezoidal backed blades	2	13-12	–
Federmessergruppen ('Final Palaeolithic')	penknife points	1	12-10	–
Mesolithic	microlithic blades and cores	5	10-5	–

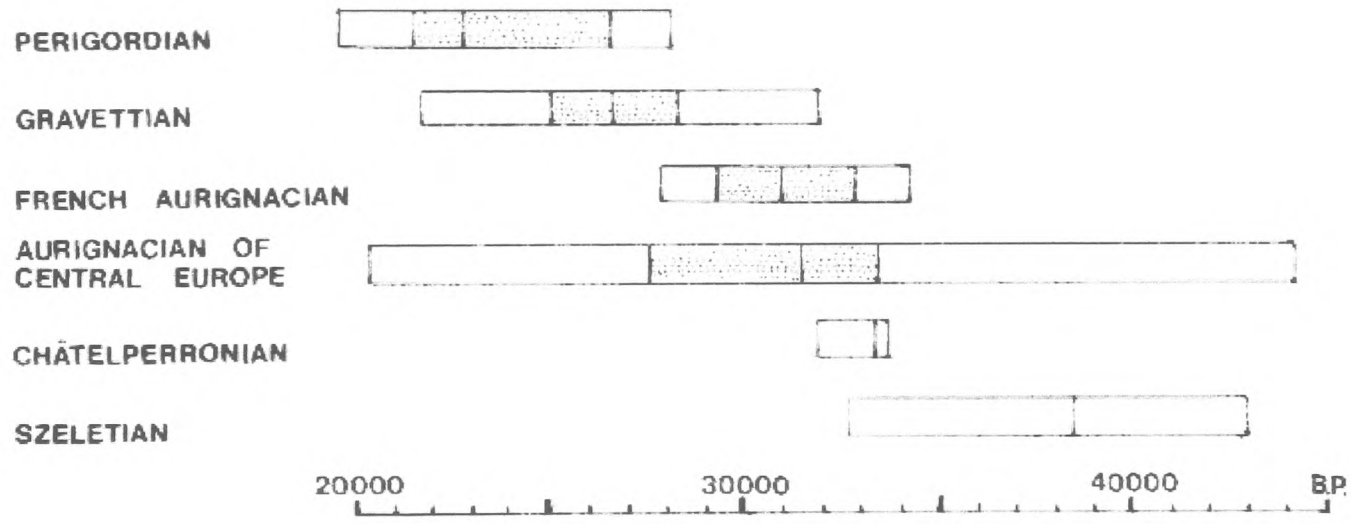

Fig 5.1: Date Ranges for Early Upper Palaeolithic industries across Europe. Interquartile range (shaded area) and median (centre line) are shown. (After Hahn 1977).

The phases may represent separate cultures, although a degree of overlap, particularly between the leaf point phase and Aurignacian is suspected. Dates potentially relevant to the Aurignacian seem much later in Britain than in France, and leaf points also persist later, raising an intriguing question of contemporaneity. An overview of each industry is provided below, with reference to the Paviland examples.

Leaf point phase: The earliest leaf point phase is one in which laurel leaf shaped tools occur throughout central and south-east Europe, although they are not present in France. They are totally bifacial implements, with extensive flaking from both edges, varying from five to fifteen centimetres in size. Such finds are well-documented in later Mousterian contexts which have a tradition of bifacial working in the production of small handaxes; and which range across central Europe. Good examples were found in the upper layer of Mauern, South Germany, a site examined by Bohmers (1951).

Bohmers named this the Altmühl industry. Apart from the leaf points it comprises Mousterian side-scrapers, Levallois points and has no clear Upper Palaeolithic features apart from a few blades. Unfortunately this site is not reliably dated, and an age of 35 000-40 000 BP is merely guesswork. Allsworth-Jones (1986) considers this issue thoroughly, in addition to a review of leaf point industries in Italy (Uluzzian) and Poland (Jermanovician). No definite examples of these Altmühl flake leaf points are known from Britain. Those ascribed by Campbell (1977,150) to this date are probably Neolithic or early Bronze Age in origin (see section 5.3 below).

In layer six at the Jermanovician site of Nietoperzowa, Poland, most of the leaf points are only partially retouched and are made on thick prismatic blades rather than flakes. Similarly, at Paviland, retouch is only applied when needed to complete the leaf-shaped form. The rest of the technology from layer six at Nietoperzowa is essentially Upper Palaeolithic, with a minimum ^{14}C date of 38 000 BP.

An identical pattern is seen at the Ilsenhöhle, a cave situated below Ranis Castle in Thuringen, south Germany. This is an undated Szeletian site where bifacial leaf points in a primary layer are succeeded by partial leaf points made on blades. In this second archaeological layer partial leaf points are found exclusively (Hülle 1977,58). A gradual

transition is evident in this case which may well be true of other leaf point industries - although the mechanics of this transition are still a matter of speculation. Middle Palaeolithic industries (those with bifacial, that is, handaxe technology) may, therefore, plausibly be the precursor of leaf points.

Neanderthal hunting techniques probably used spears to bring down an animal at close range, hunters co-operating perhaps in groups of around five individuals (Berger & Trinkhaus 1995). Neanderthal skeletons show a pattern of injuries concentrated in the upper body and arms, which could have been caused by such encounters. There are few examples of spear-throwers in the Aurignacian, and none connected with leaf point assemblages. Neither is there convincing evidence for archery in the earliest Upper Palaeolithic. It is therefore assumed that these tools are spear points, designed for the close-range hunting of large animals. We do not know whether the leaf point industries are produced by late Neanderthals or modern humans. Leaf points may be evidence of the acculturation effect of one group on the other, originating from the observation of Neanderthal hunting techniques by modern humans, or Neanderthal observation of blade technology.

The pieces are made on blades and partially retouched at both ends to form a leaf shape - the cross-section being plano-convex or pointed oval in many examples. The tip is particularly thin. Bosinski (1990) remarks that this morphology would be successful in hunting because if the weapon broke the thin point would remain in the wound, further disabling the animal. An overall impression is that they are points to be hafted on wooden spear-shafts (Bosinski 1990,53), although it is possible that they have multiple functions, for example knives. That they are projectile tips is supported by study of the Pulborough leaf points which have flute or burin-like fractures originating from possible impact fractures (Jacobi 1986,63). The Paviland examples (Fig 4.1) lack any trace of impact fractures or hafting wear.

Further research may be able to delineate typological divisions within the leaf point group. A preliminary hypothesis is that there are two types of leaf points present in British assemblages; the first has a flat lenticular cross-section and is totally bifacially modified, by flat invasive scalar flaking from both edges. Paviland has one broken

example of this type, the blunt proximal end[5] which on the basis of its heavy wear and deep patination is assumed to be of early date.

The second type is exemplified by a complete leaf point from Paviland[6] (Fig 4.1a) and five broken pieces which have been interpreted as leaf points on the basis of the prismatic blade form and thin bifacial flake removals at the proximal and distal ends. Partial or unifacial working would certainly be a faster way of creating the same shape as the completely bifacially worked example. Examples of the unifacial type do not appear to be as well worn as the totally bifacial implement.

It is in the leaf point phase that high quality flint is first imported to Paviland, and is used equally with rhyolite and Carboniferous chert. Whether this signifies a behavioural shift or simply the accessibility of sources cannot be known. The flaking technique termed 'proto-Solutrean ' (Sollas 1913,351) is known to belong to this phase, but the term is no longer in use. However, a stylistic study of this sub-parallel, flat invasive flaking technique may be of use, as it is used on other implements of the leaf point phase (for example blade fragments from Uphill 8), and therefore may be a cultural attribute.

Environmental indicators from Ilsenhöhle indicate a phase of temperate climate (Gamble 1986,188). A date of 36 200 ± 1250 was obtained from the remains of stratigraphy from Nietoperzowa, placed in the relatively warm Hengelo interstadial of OIS 3. Jacobi (1986,67) seems to be of the opinion that leaf points may be more recent in date, comparable with a date of 28 000 BP for Kostenki. He interprets the Pulborough collection as being from early in the late Last Glacial, during which the area from south-west Wales to the central European plain would have been cold, dry steppe inhabited by mammoth and woolly rhinoceros herds, as well as by their hunters.

A final question to be addressed is that of the potential overlap between leaf points and Aurignacian phases. Leaf points from Kent's Cavern are dated by Campbell (1980,73) to between 38 000-28 000 BP; which, if correct, places them within the range of the French Aurignacian, and extremely late in comparison with European dates. It is

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[5] OUM Acc. No. S317
[6] OUM Acc. No. S420

possible that cultures became differentiated and persisted later in these marginal and sparsely populated areas.

There is only one example of a leaf point collection in Britain which includes other forms; this is the fortuitously preserved open air site at Pulborough, West Sussex[7]. Here 198 items survive; described by Jacobi (1980b; 1986). In addition to the leaf points, a single burin spall, lames mâchurées and long crested (prismatic) blades were found. The platforms of the thicker blades are often faceted, bulbs are diffuse and there are usually clear lips suggestive of a 'soft hammer' mode of striking (Jacobi 1986,63). Also from Pulborough, there are five end-scrapers on otherwise unmodified blanks. Of these, one is combined with an inverse truncation at the opposite end of a long blade; and one or two with burins. There are nine dihedral burins and a single piercer - all in all a typical Early Upper Palaeolithic technology. Recycling of tools and knapping probably took place, as flint can be conjoined and opposed platform blade cores are present. There are no bone, antler or ivory tools. Jacobi (1986,64) compares inverse truncations in association with dorsal surface removals with implements ('Kostenki knives') from Kostenki and Avdeevo, sites on the Russian Plain. The age of Pulborough is not known, but level two of Kostenki 8 is dated to 27 700 ± 7 500 BP (GrN 10509). Kostenki knives have no equivalent from any other British find spot, and serve to demonstrate how much cultural evidence is missing from the archaeological record of the Early Upper Palaeolithic.

Originalities arising in British assemblages are usually interpreted in terms of two lines of cultural influence - from France and Central Europe, leading to an anomalous mixture in the north west which is difficult to interpret. Jacobi (1986,66) reflects this viewpoint by writing 'technologies of Atlantic sea-bord type may make up a part of any British Early Upper Palaeolithic sequence.' A functional difference may also be suggested, between leaf point (hunting) and Aurignacian (home base) components of the same industry. Aurignacian bone points are interpreted as points for spears, but there is no lithic equivalent. Paviland would provide a good example of a home base, in which for example engraving tools were used to produce ivory artefacts. A hunting camp could

[7] O.S. TQ 074203

be illustrated by the Pulborough assemblage, which has flint items in the process of transportation between larger sites.

Aurignacian II: The Aurignacian is named after the site of Aurignac in the Pyrenees. It originated in a colder phase after the Hengelo interstadial, but one which was not extremely rigorous, and expanded during the next warm period, the Denekamp interstadial. It is the Early Upper Palaeolithic culture quoted as the earliest modern human industry; the expansion of modern humans across Europe is mirrored in the spread of the Aurignacian (Mellars 1992,228). The diagnostic tools of the Aurignacian II are busqué burins and carinated scrapers, which may have a shoulder on one or two sides (Fig 4.3 b-e), perhaps a functional adjustment. Busqué burins and carinated scrapers may have served a similar purpose (Bosinski 1990,57).

Aurignacian blades (Fig 4.3a) are often rectangular, s-shaped, tongue-shaped or 'strangulated' (with opposed notches). They may have semi-invasive scalar retouch around all edges. Carinated scrapers are keel-shaped implements most usually made on thick flakes. They resemble cores with small blade removals to form the scraping end. They were most probably used for hide scraping or wood working. Shouldered and nosed scrapers are similar in morphology to carinated scrapers but have a round projection on the scraping edge. Carinated and nosed scrapers are unknown in later Upper Palaeolithic periods and are atypical but not absent in late Mousterian industries (Mellars pers. comm.).

Busqué burins are a distinctive tool with a worked notch on one side, which serves to stop multiple burin blows. The multiple burin facets are cut by another, perpendicular facet to produce a wedge shaped gouge. Busqué burins are geographically and temporally restricted in range, occurring in the Aurignacian II of Europe only. They are present in the Paviland collection (examples illustrated here in Fig 4.2 a, b).

The busqué burin appears in the second phase of the continental Aurignacian. ^{14}C dates from Arcy-sur-Cure, the Abri Pataud and Vogelherd suggest a date of around 33 000-28 000 BP (Mellars & Bricker 1986) There are seven busqué burins from Paviland, fewer than Campbell's count of thirty, but still suggesting a substantial phase of occupation. The prime question for

further research should be to what extent we can rely on busqué burins as a type fossil for the Aurignacian in Britain, or whether, in this marginal area, it persists later and could be included with the Perigordian material. If busqué burins are a tool specifically made for a functional task (bone working) there is no reason why they should not occur later than expected. Paviland busqué burins, although inclusive of atypical examples, are by no means significantly different in morphology from those in south west French sites. Accordingly, for the present, without further data, it would seem prudent to adhere to the standard view that they are a reliable diagnostic tool type for the period.

A very distinctive tool type, present in the French Aurignacian but notably absent from Britain, is the Dufour bladelet. This is a small and delicate bladelet with fine nibbled retouch which occurs on both long edges, but on opposite (inverse) sides of the blade. Occasionally longer or pointed versions are found, known as Font-Yves points. The absence of these bladelets from Paviland may be explained in functional terms, but it is likely that Britain was beyond the range of the Early Upper Palaeolithic cultural group which produced them.

The Aurignacian has the earliest worked bone tools in Europe, of which the split based bone point is most common. The split base allows an articulation with the haft, and the point has a very variable size range. In the Istállöskö Cave, in the Bükk mountains of Hungary two stratified Aurignacian levels have ^{14}C dates of 31 500 for the lower and 30 600 BP for the upper level (Gamble 1986,183). These are broadly contemporaneous with leaf point industries. Bone tools in the lower level formed 71% of the combined lithic and bone tool inventory. The split base projectile points made in antler, bone and occasionally ivory are a marked feature of Aurignacian assemblages from caves although they are very rare indeed in open air sites.

The biconical or losengic bone point, pointed at both ends, is often found in the late Aurignacian. It must be noted that no diagnostic bone tools, that can definitely be said to be of Aurignacian origin, are present in the Paviland collection.

Four stages of the developmental sequence of the Aurignacian was defined in France, by Denis Peyrony's work at the site of La Ferrassie:

Aurignacian I:	High frequencies of blades
	Marginal retouch on blades is common
	Split based bone points are common
Aurignacian II:	High frequencies of nosed scrapers
	Large numbers of busqué burins
	Marginal retouch becomes rare
	Split based bone points replaced by biconical points

For the purposes of this study it is concluded that the Aurignacian II, with busqué burins, a greater number of burins than end-scrapers, and no split based bone points is the most likely of these comparative typological groups to be represented at Paviland, with at least 49 artefacts attributed to the phase.

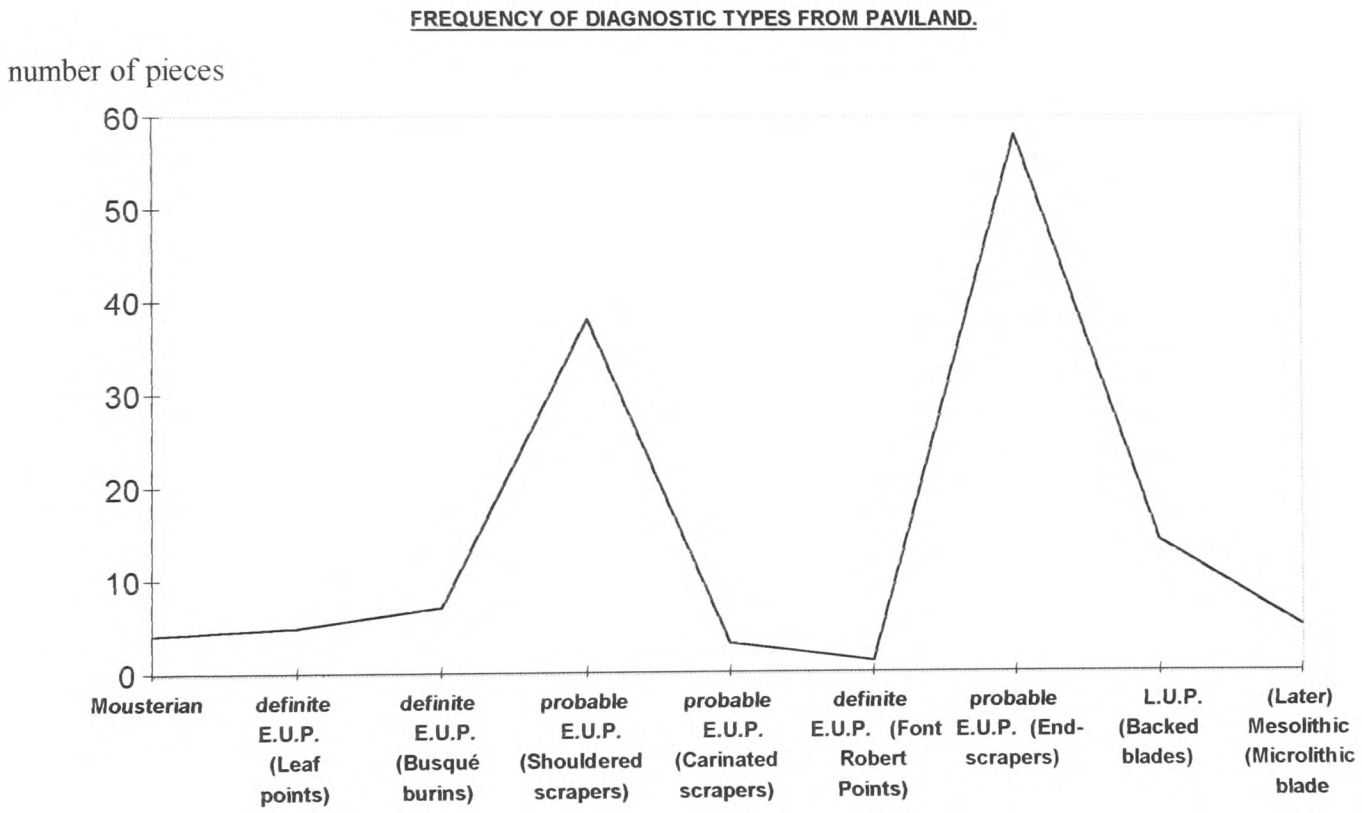

Fig 5.2: Frequency of Diagnostic Types from Paviland.

The Upper Perigordian or Middle Early Upper Palaeolithic: The Aurignacian in Europe ends at around 28 000 BP and is followed by the Upper Perigordian, a term used loosely to describe very varied assemblages. The term 'Perigordian' was coined by D.

Peyrony in 1930 and consisted of five phases. Since then a number of changes have occurred in the sequence, which is currently described:

Upper Perigordian	IV	Gravette points
	Va	Font Robert points (tanged elements)
	Vb	Truncated Elements
	Vc	Noailles burins
	VI	at site of Laugerie-Haute, Dordogne only
	VII	proto-Magdalenian

In the Upper Perigordian IV, or Gravettian, lithics industries are dominated by Gravette points. These are highly distinctive, being sharply pointed with a straight, slightly curved back and sometimes blunting on both edges. They range from 2-10 cm in length. Microgravettes form a distinct group, similar in morphology but less than 2 cm in length. They have been described as missile (possibly arrow) points. Other tool types are fléchettes - very small leaf-shaped blades with fine nibbling retouch around all edges - and large flake scrapers of an oval form and with a diameter of about 7 cm. None of these types are present at Paviland. Therefore, between the Aurignacian and Font Robert point periods at Paviland is either a hiatus of occupation or an occupation by Palaeolithic peoples which has left indistinguishable or unrecognisable traces. It is tentatively suggested that Aurignacian and idiosyncratic forms may continue through this time; although it was a time of deteriorating climate at the end of the Upton Warren Interstadial Complex (OIS 3).

The Upper Perigordian is evidently a period with rapid change in tool forms. As well as innovations and rapid diffusion of ideas, rapid shifts in population should be taken into account; immense time spans are being considered, in which significant climatic fluctuations (6°C changes) took place, leading to alterations in the extent of plant and animal populations. Small hunter-gatherer groups were no doubt susceptible to isolation and extinction, as well as expansion and differentiation in times of prosperity.

The Red Lady burial chronologically falls within the Upper Perigordian phase. There is only one artefact from this phase recognisable in the collection; the broken tang

of a Font Robert point[8], the type fossil of the Upper Perigordian Va phase (Green 1984,28) (Fig 4.9e). The tang was perhaps carried back to the cave while hafted, for refitting. On the basis of dates from the open air site of Maisières-Canal, Belgium - which represents the first phase of the Belgian Perigordian (Otte 1984) - one may suggest an age of around 28 000 BP for these heavy single-tanged points.

The Abbé Breuil thought that the three Paviland spatulae might be 'less ancient' than the other bone implements. (Sollas 1913,361). He pointed out that the bone of which they consist is 'not much altered', and that their form recalls 'ancient Magdalenian' (i.e. Badegoulian) bone working (Breuil 1912, Fig. 25:4). The Magdalenian, however, is now ascribed to 18 000 BP, the height of the Devensian, and is mainly confined to south-west France. One of the Paviland spatulae[9] has been dated to 23 670 ± 400 BP (OxA-1790), and therefore should belong within the Upper Perigordian phase.

The Upper Perigordian phase is limited in its geographical extent, having a very thin distribution in Britain, none at all in south-west France, and is mainly concentrated in Belgium and the Low Countries. It is suggested that groups may have moved, perhaps annually, between southern Britain and the Low Countries; and that the Aurignacian as well as Upper Perigordian influence originated there. The absence of such later Perigordian types as truncated elements and Noailles burins from Britain would support a dating early in this phase of c. 28 000 BP.

Late Upper Palaeolithic, Creswellian and Penknife Point Industries: The evidence from Paviland concurs with the hiatus hypothesis, which states that few if any human groups visited Britain during the Late Glacial Maximum between 23 000-13 000 BP. The final component of the Paviland collection to be considered here is the Late Upper Palaeolithic industries, which occur in another period of complex climatic change at the end of the Devensian, spanning the time 13 000-10 000 BP, in which warming and deglaciation was rapid, and Britain was recolonised.

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[8] OUM Acc. No. S418
[9] NMGW Acc. No. 15.277/7

The climatic chronozones within this period have different nomenclature in different countries, and also in the traditions of different academic disciplines in the same country; for clarity absolute dates will be used. Owing to work on other sites in Britain and Northern Europe which link lithic assemblages to pollen sequences, the temporal acuity of the Late Upper Palaeolithic is more greatly understood, and comparative studies are becoming more confident.

Table 5.2: Lateglacial Chronozones (based on Barton & Roberts 1996).

^{14}C YEARS BP	POLLEN ZONES	NORTH-WEST EUROPEAN CHRONOZONES	BRITISH STAGES	PAVILAND INDUSTRIES
	IV	PREBORIAL	FLANDRIAN	-
10 000	III	YOUNGER DRYAS	LOCH LOMOND STADIAL	FINAL PALAEOLITHIC (FEDERMESSERGRUPPEN)
11 000	III	ALLEROD	WINDERMERE INTERSTADIAL	
11 800	Ic	OLDER DRYAS		
12 000	Ib	BØLLING		CRESWELLIAN
13 000	Ia	(DEVENSIAN)	DIMLINGTON STADIAL	-

Paviland is assumed to be of lesser importance during the Late Upper Palaeolithic (Green 1984b,300), when Gough's Cave in Cheddar Gorge became the key site of the Bristol Channel Plain region. Certainly there are comparatively few Late Upper Palaeolithic artefacts from Paviland, only the backed tools (14 examples) being recognisable. The finds from Paviland include Creswell points[10] (Fig 4.8d), Cheddar points[11] (Fig. 4.8e), and penknife (Federmesser) points[12] which appear later in the British sequence. Barton, Roberts and Roe (1991,252) propose the term 'Final Palaeolithic' for British penknife point assemblages which will be used here in place of 'Federmessergruppen'. The Late Upper Palaeolithic occupation at Paviland may be said to be greater in the Creswellian than in the Final Palaeolithic, if numbers of artefacts are demonstrative of intensity of occupation.

[10] For example NMGW Acc. No. 24.94/290
[11] OUM Acc. No. S401
[12] OUM An S414

Late Upper Palaeolithic material differs considerably in detail from that of the Early Upper Palaeolithic assemblages. Worked bone includes uniserial barbed antler spear points, an example being from Porth-y-Waen, Shropshire (Britnell 1984,385), dated to 11 390 ± 120 BP (OxA-1946) and the shank, probably of an eyed needle at Cat Hole, Gower (McBurney 1959). The predominant change in lithics industries is the appearance of a large number of backed tools made from blade segments, designed to fit into lateral grooves in shafts and probably used either as elements of projectiles or composite knives.

The Creswell point (Fig. 4.8d) is an angle-backed blade fragment with abrupt retouch on two sides (Green 1984b, Fig. 10a). The Cheddar point (Fig. 4.8e) is a trapeziform blade fragment with abrupt retouch on three sides (Green 1984b, Fig. 10b). Penknife points are also blade fragments with a rounded retouched blade (Green 1984b, Fig. 10c).

Other Creswellian artefacts include tools made on the ends of long, straight blades such as end-scrapers (Barton & Roberts 1996, Fig. 5.3) and those with characteristically rubbed ends (Barton & Roberts 1996, Fig. 4.4). The debitage also includes long, well-made blades which are slightly curved in profile, indicating that they were detached from cores with a single preferred flaking direction. The blade butts sometimes display an 'en éperon' (spur or dihedral) preparation (Barton & Roberts 1996, Fig. 5.4) as recorded on blades in continental Late Magdalenian assemblages. The flat, diffuse bulbs indicate a predominantly soft hammer mode of blade production. One possible example is noted from Paviland (Fig. 4.5e).

Other tools associated with Final Palaeolithic industries are typified by thick backed blades with curved outlines and basal retouch (Barton & Roberts 1996, Fig. 6). The tools are all on smaller blades; utilising gravel flint and raw materials of local origin in significant amounts for the first time (Barton & Roberts 1996,255), as exemplified by Three Holes Cave and Broken Cave in the Torbryan Valley, Devon. An accelerator radiocarbon date on an associated (but unworked) arctic hare bone places the Broken Cave occupation at 11 380 ± 120 BP, within the Allerød interstadial. Similar dates may be predicted for this industry at Paviland.

Garrod (1926,194) viewed Creswellian geometric points as being a culture with essentially the same basis as the French Magdalenian, but diverging along separate lines of development; producing many variations in assemblage composition as well as tool morphology. For example, the 'elongate trapeze' backed tool forms were noticeably absent in the assemblage from Mother Grundy's Parlour, Creswell Crags (Garrod 1926,193). With so many similar lithic industries (Belgian Tjongerian and Hamburgian, French Final Palaeolithic), any attempt to draw meaningful parallels should be closely reliant on careful consideration of absolute dates.

There are only a few possible Creswellian sites outside Britain (R. Charles, pers. comm.) Means of comparison are difficult to find, as the British Creswellian is poorly published. Sites such as Presles (accelerator ^{14}C dated to 12 000 BP) and Trou d'Lossaire (biostratigraphically dated by deer remains to 11 000 BP) in Belgium are likely to be palimpsests reflecting both Creswellian and Magdalenian groups (Leotard & Otte 1988,189). The area must have been ephemerally occupied during the Younger Dryas or Loch Lomond Stadial (pollen stage III at 11 000 BP) during which temperatures fell 8-10°C. Ice sheets readvanced particularly in Scotland and cirque glaciers formed on the high ground of Wales (Campbell & Bowen 1989). There is no record of human population in Britain during the sub-arctic climate of the following millennium.

The Belgian sites lack stratigraphic record for exactly the same reasons as does Paviland. Grotte de Verlaine, exavated in 1888 is a small cave site, bone samples from which have been dated to 13 700 BP (R. Charles pers. comm.) and are associated with a Magdalenian IV lithic industry showing more affinity with France than Britain. Trou de Chaleux is a cave site with a single central chamber, excavated by Dupont in 1872. It has been dated to 12 800 BP, placing it in the Allerød interstadial, but again does not have a lithic industry comparable to the Creswellian. Barton and Roberts (1996,258) suggest that the British Creswellian, which has similarities with the French Late Magdalenian is superseded by the penknife point 'Final Palaeolithic' at around 12 000 BP, the nature of the succession being unknown ('transition' or 'replacement'). The Final Palaeolithic has similarities with the Federmessergruppen sites in Germany and north France.

Leaving aside the possibility of some chronological overlap around 12 000 BP, the two types of assemblage are sufficiently distinct to be regarded as belonging to separate technological traditions. Penknife point assemblages would be expected to date from the later phase of the Windermere/ Lateglacial interstadial (equivalent to the Allerød chronozone) while Creswellian assemblages would be confined to the first half of the interstadial (equivalent to the Bølling chronozone). Although no further conclusions can be drawn from the small number of examples which Paviland has provided, there was probably a higher human population in Britain during the Final Palaeolithic than the Creswellian, there being a larger number of find spots for Final Palaeolithic artefacts as compared with Creswellian and the former also having a wider geographical range.

5.2: Differentiation and Specialisation in Tool Types.

'Local typological gaps... need no longer imply lengthy breaks in human residence. Instead these 'gaps' may be filled by previously unsuspected and genetically unrelated typological combinations.' (Jacobi 1986,66)

This quotation aptly highlights the danger of relying on typology for a site in an area and for a period in which archaeological succession is far from clear. It refers to the open air 'camp' site represented by the Pulborough leaf point assemblage, but applies equally well to Paviland. Differences in assemblages are expected due to the very small 'windows' which each site provides onto the vast depth of the Early Upper Palaeolithic. A break in occupation should not be predicted on an absence of expected tool types alone, the only accepted substantive hiatus being that due to the glacial maximum between 23 000 - 13 000 BP.

As mentioned at the start of this chapter the division of artefacts into industries is an artificial one, dependant on the recognition of specific forms of implements present in more well-dated sites which may often lie some distance away. Owing to this assumption, cultures have often been given improbably wide geographical ranges (for example Breuil 1922, 262). On the other hand, in order to explain unexpected archaeological associations new 'cultures' may be invented, leading to a proliferation which may sometimes be better explained in terms of functional differences (Binford & Binford 1969) or inadequate stratigraphy. Comparisons on the basis of differing numbers of the same tool type, or 'proportional' comparisons (for example Hahn 1977,307, carinated burins in Aurignacian assemblages) should be more tentative than those which rely on presence/absence of fossils-directeurs, or even on non-lithic criteria; especially if the sample size is small. Technological differences (for example single or bi-directional use of cores) can also be good criteria, as these are passed on through the teaching/ learning process, and therefore will persist and become widely spread.

This section will highlight a tool type which is idiosyncratic to Paviland and on this basis will suggest that a Paviland industry exists which differs slightly from other Early Upper Palaeolithic industries. This is only a tentative suggestion, as it is impossible to determine the age of the idiosyncratic artefacts with confidence, whether they do

belong together, and in association with what other tools. However further research may be able to formalise a description of the Early Upper Palaeolithic industry at Paviland, in terms of the composition of standard tool types (burins, truncations *etc.*) and assess how these compare with other assemblages.

The idiosyncratic type has been included in the catalogue under the same nomenclature as more typical forms. Examples have been called shouldered end-scrapers (de Sonneville-Bordes number 14). It is termed by Breuil 'rostrate grattoir with inverse terminal retouches.' Breuil does not mention that he thinks it is a unique type so the possibility remains that he had seen something similar in his wide experience. However, an investigation of the available literature has produced no comparable examples. Breuil states that the retouch scars are on the 'underside of the rostrum' (*i.e.* on the ventral surface of the nose). They are illustrated in Sollas (1913, Figs. 9.48 and 9.49) and here (Fig. 4.9 a,b,c). The implements are made on flake blanks of flint and fine grained Carboniferous chert to a form which does seem standardised, as four to six retouch facets on the ventral (inverse) surface slope down from the right to the left side of the piece. The tool should be defined by the style and position of retouch, which seems to round what is presumably the working edge. A projection is produced with an edge of varying angle/sharpness but which is as strong as a burin working edge.

Although most obvious on the shouldered scrapers it should be noted that the distinctive retouch is also present on the end of a blade forming an atypical end-scraper[1] as well as on two examples of what are probably resharpening flakes[2]. It has also been used as a platform for a burin removal in at least two cases. The retouch does not compare with those patterns of damage produced on an implement by pressure and rotation (P. Mellars pers. comm.). Indeed, as it usually slopes down from left to right it may signify 'handedness' on the part of the person who made them, as it would be easier to produce this pattern by retouching with the right hand, the blank being held in the left. In all there are twenty-five examples of tools with this retouch, making up four percent of the Paviland assemblage and presumably (although not certainly) coming from the same

[1] British Museum Accession Number 1916 6-5:117
[2] National Museums and Galleries of Wales Accession Numbers 24.94/355.130 and 24.94/164b

occupation. Four percent may not seem a particularly high occurrence but it is encouraging to have some evidence of contemporaneity in an Early Upper Palaeolithic assemblage for which the ^{14}C dates span at least 23 500 years. It is suggested that regional idiosyncrasies are more likely to have occurred over a short time span than widespread industries such as the second phase of the Aurignacian. None of the pieces are burnt and so, unfortunately, absolute age estimates cannot be carried out on them directly.

It would be extremely interesting to know the function of these implements. On the basis of their similarity to burins, it is suggested that they may be engraving tools for working bone, antler and ivory. Unfortunately the examples from the NMGW have been well handled, and many have been covered with wax (in the process of making casts) or glue (from previous displays) and so they are not suitable for edge wear study.

The next question to be considered - although it may never be answered in full - is that of why there are types idiosyncratic to Paviland. It is postulated that they represent part of the material culture of a particularly small and mobile hunting group. An extremely sparse archaeological record has been left in this area for two reasons: the lightweight nature of the hunting equipment and the effect of post-depositional factors. Leaving aside the idea of an 'ivory workshop', the hunters' material culture would probably be adapted for ease of transport and subject to a high degree of recycling. Hahn (1977,309) gives only one example of end-scraper re-sharpening (at Lommersum) for the entire Aurignacian, but Jacobi (1986,63) describes intensive recycling of leaf point blades.

Hahn suggests that for open air Aurignacian sites (such as Langmannersdorf and Muralovka) which were probably occupied only once or twice in a certain season, the size of the occupation can be estimated from the extent of the settlement structures and the amount of meat consumed. This can be compared with the number of artefacts found, and indicates a very low replacement rate: only four tools seem to have been produced per person per month[3]. A high degree of curation is implied and a relatively sparse archaeological record results. If this criterion is applied for Paviland, which has 73

[3] person/month = no. of tools/4

possible Early Upper Palaeolithic tools (a conservative estimate), the density of occupation is 18 persons in one month, or one person for one and a half years.

Judging from Hahn's data gathered from fine grained loess sites, the use of artefacts seems not to have been very high, so that even a large group could have left only a few artefacts in a short occupation. Twenty to thirty persons are indicated for the size of local groups at the southern Russian sites of Muralovka and Kostenki 1,3 (Hahn 1977,310). His estimation of the population density during the Aurignacian gives 0.1-0.2 persons/km^2, for central and eastern Europe. If this could be extrapolated to Wales, which (when unglaciated) has an area of 20 768 km^2, a generous population estimate can be made of two to four thousand for the entire country.

The effect of the glacial maximum, retreat of the ice and subsequent erosion means that no Early Upper Palaeolithic open air sites are known *in situ* in England or Wales. Indeed, it may be said that the Aurignacian in Britain is confined solely to cave sites. Idiosyncratic differences may be noted between cave and open air sites of this period which could result from a number of causes. Jacobi mentions a difference in size between the 'massive' Pulborough leaf points (around 14 cm) and their smaller counterparts found in caves (8 cm for the complete Paviland example). Apart from culture-history considerations, the reduced size of the cave leaf points may reflect not just smaller original volumes of flint available for their manufacture but reduction resulting from longer curation histories with frequent re-pointing and consequent edge re-chipping to maintain the desired outline and symmetry (Jacobi 1986,63).

Paviland has further problems of preservation. Stone tools do not decay but much of the organic component of the Early Upper Palaeolithic material is largely missing, and the uses of those items which do remain are far from clear. The bone spatulae have been interpreted as 'marrow scoops' (Sollas 1913,361) and a tongue-shaped ivory object as a smoother or 'lissoir', implying functional rather than ritual usage, whilst the ivory 'pendant' was immediately categorised as a ritual or decorative item: 'the walls of the perforation are too fragile to resist any but the slightest strain' (Sollas 1913,364). The distinction between ritual and functional is a modern interpretation, the craftsmen who

produced these items possibly saw them as operating within both ritual and functional spheres.

The extent of lost items may be gleaned from this extract: 'bits of worked ivory were turned up by the spade in great numbers, but most of them were so soft and full of water that they crumbled at a touch.' (Sollas 1913,359). It is no wonder that in the case of such losses, the material that is available appears idiosyncratic. Owing to the dissipating effect of over one hundred and fifty years of excavation and avid 'flinting' the archaeologist may despair of possessing a relevant sample from a true Palaeolithic culture in Britain. The question then must be: does it matter that such detail is lost? There is enough material to support more generalised comments which are as valid as specific descriptions. One may expect repetitive patterns of behaviour to be 'traditional' and therefore less subject to anomalies than the 'Pompeii episodes', such as the Red Lady burial, which are so highly regarded. Indeed, we will not understand past behaviour 'just by reconstructing individual actions' (Gamble 1995,64); for repetitive patterns of behaviour only emerge over a long time span. In the case of the little known lifestyle of Early Upper Palaeolithic hunters, surely it is better to deal with the general before delving into the specific and inexplicable. The subject of human activity over the long term is one with which archaeology alone is interested; paradoxically there are as yet no uniquely archaeological theories of human action over such long time spans.

'Style', its causes, expressions and intents, is an extremely difficult concept for the archaeologist to pin down. There have been many attempts to define style (for example Wobst 1977; Wiessner 1983), which are either generalisations resulting from ethnographic studies, or very specific case studies from which extrapolations cannot readily be made. As yet, there have been no adequate studies of symbolic style in Upper Palaeolithic lithic assemblages; probably owing to the extent to which typology is still the ascendant means of study.

Style as a product of the individual could well be present in the Paviland assemblage, but since no absolute dates can yet be provided for the flints in the collection, they have a purely anecdotal value. However, they may serve as an encouragement to researchers, to look beyond typology in an attempt to see the hand of

the individual. Causes of variation in a standard type of stone tool, or the appearance of new types could be due to a number of causes. Variation in the Creswellian, Belgian and French Magdalenian has been explained by an evolutionary model, involving a group becoming separated from the main population (cultural group), with consequential differences becoming widespread and standardised in that separated group (Barton & Roberts 1996,258). Differences may in fact be favoured to accentuate the cultural distance between two groups and adhered to as an expression of group affinity. Intra-group styles arise as individual methods of making tools differ, and to express gender, age and kinship/friendship patterns. As Paviland is a marginal site in terms of its situation within Europe we may expect unique stylistic traits to be expressed in the lithic collection.

The following section will describe more types, and draw similarities between standard types for sites throughout Britain. As Hahn notes, sites may be more similar within themselves than they are to the nearest other site. The Aurignacian examples given by him are Vogelherd, Sirgensttein and Bochstein-Törle, but the generalisation probably holds true for any Early Upper Palaeolithic assemblage. Variations in styles of retouch and position of retouch on the blank (for example dorsal or ventral surface) within standardised types (such as end-scrapers) remain important indicators of local connections and innovations. It is in these considerations that the hand of the individual can be seen.

Metrical analysis of implement groupings is recommended for further study for two reasons. First it will enable a more accessible, less subjective description of the tools to be made, allowing wider circulation of Paviland data and hence allow Paviland to be incorporated in future comparative studies. Second, statistical tests following the collection of metrical data may bring to light stylistic/functional/technological differences across assemblages which are too subtle to be discerned by the eye and memory alone.

5.3 Regional Connotations – Some Other British Sites.

Whether humans visited Paviland on a seasonal basis only, or periodically throughout the year cannot be determined from the available evidence. Gamble (1983,182) describes the inhabitation of Britain during the Pleistocene as typified by a 'regular ebb and flow of occupation to the rhythms of the ice ages... and at worst... a human desert.' It is clear that throughout the Early Upper Palaeolithic the population density was very low indeed, and groups were probably unevenly distributed in response to food and raw material supplies.

Paviland is obviously a major site but it is misleading to consider it in isolation, when it is surrounded with other sites which may well have been used by the same groups on their yearly cycle. Other British sites, and contemporary sites on the continent can be used for comparison. First, a comparison could delineate the temporal and geographical extent of human groups, through similarities in their material culture. Possible patterns of movement in the landscape can be mapped and, although the data at present allows a number of different theoretical forms to be constructed (Campbell 1977 gives a core-periphery model), increasing precision in ice-core dating may allow movements to be correlated more precisely with subtle climatic changes, if these were relevant to the environment of lower latitudes.

Second, it may be possible to disentangle the effects of functional specialisation. When many sites are taken into consideration discrepancies between them could be seen as reflecting differences in the purpose of the site; a site with many leaf points may have been a hunting camp in which weapons were repaired and animals butchered. Other sites with a higher proportion of scrapers might have been used for plant food processing, by a different section of the community or the same section at a different time. A higher proportion of broken burins in conjunction with ivory or bone 'offcuts' may well signify a site dedicated to producing carved objects. On the whole, evidence for specialised sites is thin, but areas specialised for certain activities may have been designated within sites ('intrasite analysis').

The clearest stratigraphic evidence for the subdivision of the British Upper Palaeolithic is provided by Kent's Cavern, and Creswell Crags. The following review is based on Campbell's 1977 gazetteer which is the most recent comprehensive list of

possible Upper Palaeolithic sites. The list is in need of revision mainly owing to the accumulation of data relevant to climatic changes and accelerator radiocarbon measurements in the last twenty years. The material will be described and compared with Paviland on a site-by-site basis; and a summary will follow stating the changes which should be made as to how the available lithic collections are regarded.

Kent's Cavern – All phases.

Kent's Cavern, Devonshire, is an important site which most clearly demonstrates the British Upper Palaeolithic sequence and which has provided a series of tools most similar to Paviland - the second largest lithic collection in Britain, of 479 pieces.[1]

This large site lies in the lower northern slope of Lincombe Hill at Torquay. It was formed by solution in the bedrock of Devonian limestone, and partly filled with deposits, probably since the Middle Pleistocene. It has two entrances which are about 15m apart; and is currently used as a show cave.

Explorations began as early as 1825-1829 by the Rev. John MacEnery but, thus far, the only truly systematic excavations at Kent's Cavern were those conducted in a grid system by William Pengelly, with some help from E. Vivian, from 1865-1880. Pengelly's diary runs to five volumes and is preserved in the Museum of the Torquay Natural History Society, analysed most thoroughly and recently by Campbell (1977,38), who produced stratigraphic sequences from the information.

The site yielded Lower, Middle and Upper Palaeolithic artefacts with contemporary faunal assemblages. At Kent's Cavern the occurrence of blade points is dated to 30-28K. A tibia of *Coelodonta antiquitatis* found in contiguity with a blade point in the Great Chamber has been dated to 28 160 ± 435 (GrN-6201) and to 27 730 ± 350 (GrN-6325) from a radius of *Bison*. In addition a radius of *Equus przewalskii* from the same stratigraphic spit and grid location gave a date of 38 270 +1470/-1420 (GrN-6324) - likewise on unmodified fauna from layer A2 (Campbell 1977 II, 19; Campbell & Sampson 1971) - showing the difficulty of accurately dating artefacts moved in debris flows. Only the youngest age (27 Ka BP) can be used as a maximum age for debris flow

[1] The majority of material from Kent's Cavern is in Torquay Natural History Museum, but collections are also kept in the BM (Quaternary Section), the Natural History Museum, and Bolton Museum.

and leaf point deposition, although the contained artefacts may be older (Straw 1996). A humerus of *Ursus arctos* found with a bifacial point in Kent's Cavern gave a date of 28 720 ± 450 (GrN-6202). The Kent's Cavern anatomically modern partial right maxilla firstly gave an age of 38 279 +1470/-1240 BP (GrN-6324) but was later re-dated (Hedges *et al.* 1989) to 30 900 ± 900 BP (OxA 1621). Campbell obtained the above three dates and believes them to be the most reliable dates available for the British Early Upper Palaeolithic. However, due to inaccuracies in the ^{14}C method which will be discussed below, it must be stressed that these are still minimum dates. At first they appear to be centred on 27 000 BP, but actually provide a range of at least 39 740 to 27 380 BP, which is obviously less than satisfactory.

The material from Kent's Cavern at Torquay Natural History Museum seems - on rapid inspection - to reflect that from Paviland. Classic forms (end-scrapers, dihedral burins) are present, and seem indistinguishable from those of Paviland. However, there are no examples of the ventral retouch (shouldered scraper) Paviland 'idiosyncrasy'. Two tanged end-scrapers were seen, which occur in Britain only at Kent's Cavern. It is clear that Kent's Cavern has no Carboniferous chert component and more Greensand chert than Paviland. It also has a greater percentage of flint.

Campbell's concludes: 'there are interesting differences in the use of raw materials between these two sites. At Kent's Cavern 81% of the total 479 artefacts are in flint, and 18% in greensand chert, whilst at Paviland 61% of the total 5040 artefacts are in flint and 9% in greensand chert, 26% Carboniferous chert and 3% adinole.' (1977,145). Campbell relates a 'higher angle of scraper retouch at Paviland' than at Kent's Cavern to this use of Carboniferous chert which does not fracture as finely as flint.

Creswell Crags – Mousterian, Leaf points, Gravettian and Late Upper Palaeolithic. The Creswell Crags valley was formed by a stream running through the Magnesian limestone outcrop on the borders of Derbyshire and Nottinghamshire. The valley, approximately a quarter of a mile long, would have provided a natural route for humans and game. It also offered a series of shelters for both hunters and prey. The twenty-four caves and shelters of Creswell probably continued to form at different times until the

Holocene so in this case it is doubly true that lack of evidence may not mean lack of occupation (Hart 1981,19).

Although the majority of finds from Creswell Crags are Late Glacial, three out of the four significant caves in the complex have, according to Campbell (1977), yielded Early Upper Palaeolithic material. These are Robin Hood's Cave, Pin Hole and possibly Church Hole Cave; and are notable as the furthest north west extent of the Early Upper Palaeolithic. The lithic collections are divided between six places of storage,[2] rendering an appraisal of the finds difficult and time-consuming. This discussion is therefore limited to consideration of one or two diagnostic tool types only.

Robin Hood's Cave still had some stratified Palaeolithic sediment at the time of Campbell's excavations in 1969 (Campbell 1970). Late Upper Palaeolithic tools including Creswell points were found stratified beneath (in a reversed sequence, owing to the sediments being disturbed) a layer containing a small flint handaxe and other Middle Palaeolithic tools. No definite Early Upper Palaeolithic evidence was found in 1969, but such material is known from the 1874-1876 excavations by Mello and Dawkins (Dawkins 1876,252). However, its stratigraphic position in relation to the Late Upper Palaeolithic material at the site is not certain. Mello and Dawkins unearthed 267 worked flints, including two leaf points, one of which is broken[3]. It is of a similar dimension to the most complete Paviland leaf point[4] (thickness 10 mm, length 80 mm), and is also made from a blade-blank. The leaf points are bifacially worked with the majority of the shallow, invasive scalar retouch being on the ventral surface. Dawkins notes '...on the other side, the opposite edge is worked on the opposite surface, with the practical result of producing a twist in the edges analogous to that which has been observed in Neolithic arrow heads, intended to make the arrow revolve in its flight.' The same characteristic retouch pattern is found in the case of the Paviland leaf point, and in that from the Hyaena Den piece. Dawkins' functional explanation is attractive, and could well form the focus for some experimental archaeology. According to Jacobi (pers. comm.) there is also a 'wear facet' about three-quarters along the length of the piece, which may have

[2] The BM, Cambridge University Museum of Archaeology and Anthropology, Sheffield City Museum, Derby Museum, Bolton Museum, and The Harris Museum, Preston.
[3] The proximal end is in the Derby Museum (Acc. No. 613-15-1915) and the distal end is in the Manchester Museum (Acc. No. RHCL 126 Box 15).

resulted from hafting. If these pieces were hafted as spear points, one would expect at least a third of their length to be included in the haft.

Flint sources are about forty miles distant; samples which show gravel staining and weathering may have been obtained from the Trent valley, but the finer material may have come directly from southern Chalk (Dawkins 1876,258). In contrast to Paviland the state of the flint, especially its patination, is highly variable, ranging from cream to beige, and grey on the 53 specimens seen.

Pin Hole Cave is further west but on the same (south facing) side of the crags as Robin Hood's Cave. Work at this shelter uncovered a varied Pleistocene fauna including mammoth, woolly rhinoceros and hyaena. Water action, probably by the stream, has disturbed the deposits and evidence of human occupation is not as abundant as at Robin Hood's Cave (Hart 1981,19). The cave produced at least six side-scrapers, a unifacial leaf point and bone tools belonging to the Early Upper Palaeolithic (Mello 1875).

Three retouched flint blades were found, one of which[5], illustrated by Campbell (1977, Fig. 100:1), is very similar in working to the leaf points; and indeed was listed by Jackson (1967,16) as a flint blade of Proto-Solutrean type. Semi-invasive scalar retouch covers both surfaces of the blade at the proximal end, and chipping and cryoturbation notching continues along both sides of the piece. This blade serves to remind us that in investigating the leaf point phase, that is, the earliest Upper Palaeolithic phase; we should be searching for a technological change or a new style of retouch which can be applied to many tool forms, rather than simply the presence of leaf points as a single diagnostic form. There are possible fragments of these from Paviland[6] and indeed owing to their early dates, no later than 28 000 BP (Campbell 1980,73), one may expect their survival to be more limited than younger material from the same site.

Pin Hole Cave produced two tanged 'Font Robert' points. The first has been conjoined from three separate pieces by Jacobi (pers. comm.)[7], and broken in antiquity as the context numbers differ. The second Font Robert point was found by A. L. Armstrong in 1925 'under vertically placed slabs' and is complete. Recent damage shows that it is

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[4] OUM Acc. No. S420
[5] Manchester Museum Acc. No. 33848
[6] NMGW Acc. Nos. 24.94/312, 24.94/315, 24.94/314a

made on black, high quality flint. This point allows us to imagine what the Paviland point[8] would have looked like when complete; a heavy irregular triangular point with a thick, abruptly retouched tang, the overall dimensions being length 137 mm, width 42 mm, thickness 15 mm. (Campbell 1977, Fig. 100:3). These also compare favourably with those from Belgium, but the angularity of the Pin Hole Cave piece does not agree completely with the more rounded Paviland tang. There may be sub-types of Font Robert point which have not as yet been recognised.

It should be emphasised that no diagnostic Aurignacian II tools have been found at Creswell, no busqué burins, carinated or nosed scrapers. The busqué burin from Ffynnon Beuno remains the sole evidence for an Aurignacian expansion further north than Paviland. The potentially earlier leaf point industry is, however, well represented. Further work to explain this phenomenon, for example in terms of climatic differences or behaviour of the hunters, is needed.

There are no definite Early Upper Palaeolithic tool types from Creswell among the fifteen pieces in the Sheffield City Museum. This material is entirely from Mello and Dawkins' breccia and cave earth layers, where their records provide no evidence of any internal sub-division of the site's Upper Palaeolithic series. Finds from Creswell in the Manchester Museum number many hundreds. Pinhole and Robin Hood's Cave comprise 14 boxes, and about a hundred pieces are on display. A portion of a clay-ironstone biface is also stored here, from 'Mother Grundy's parlour.'

Finds from Creswell in the Bolton Museum[9] embody two fragments of antler and bone, and 16 lithic pieces, mostly white patinated blade fragments. These comprise the Pennington collection, from Robin Hood's Cave and Church Hole Cave, and none are retouched.

Finds in the Harris Museum, Preston, are from the private collections of a local antiquary named John Weld[10]. Three un-retouched flint flakes with grey-white patina and two quartzite flakes (pink and liver coloured) are probably from the 1875-1878

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[7] The fragments currently kept at Manchester Museum (Acc. No. 33831) and Derby Museum (Acc. No. ph (L) 81, box 6).
[8] OUM Acc. No. S418
[9] Acc. No. 15.88
[10] Acc. Nos. A1-A6

excavations at Robin Hood's Cave. There is also a fragment of a *Bison priscus* distal humerus, stained black and with hyaena damage.

Coygan Cave - Mousterian.

Apart from Paviland, Coygan Cave in Carmarthenshire is the only Mousterian site in South Wales site. It is now unfortunately totally destroyed by the quarrying of the Carboniferous limestone in which it was situated, but was located about a mile from the sea. Like Paviland, it commanded a view of the Bristol Channel and was south-facing. However, it was smaller than Paviland and possessed the shelter only of low surrounding cliffs. Coygan Cave also had a narrow terrace where activities may have taken place.

Visits to Coygan Cave were recorded as early as 1866 (Royal Commission County of Carmarthen 1917), and five separate excavations took place from 1866-1964. The most recent excavation was carried out by a team from Cambridge University led by Charles McBurney and John Clegg during the early 1960s, which revealed a sequence with a Mousterian occupation, apparently predating a middle Devensian hyaena den accumulation of chewed bones and hyaena coprolites. A hearth was also found which is incompletely provenanced but which may have been a feature of the Middle Palaeolithic occupation. The faunal assemblage was varied, including lion, mammoth, horse and reindeer. The Neanderthal occupation fell into the time span 64 000-38 000 according to Uranium-series and ^{14}C dates recently published (Aldhouse-Green *et al.* 1995), whilst the *Crocuta* occupation possibly ran from 40 000 or earlier to 24 000 BP.

One of the chert flakes found by Eccles in 1915[11] has similarities with the Paviland 'proto-Levallois' flake[12]. The coarse, grey-white flake has a plain, unretouched butt and a significant part of its lateral margin and surface show signs of water rolling indicative of collection from a secondary source rather than an outcrop. Flake scars on the left proximal area ('pretouch' rather than retouch as they occurred when the flake was still part of the core) are very worn and rounded. The Paviland flake is of a similar size (length=115 mm, width=90 mm, thickness=20 mm), also shows rounding, and has orange 'river gravel' staining on a potion of surviving surface. It is of Greensand chert

[11] Carmarthenshire County Museum Acc. No. A76.1075. Illustrated in Aldhouse-Green *et. al.* (1995, Fig. 73d)
[12] NMGW Acc. No. 98.18

possibly imported from the Blackdown Hills, but which has also been in a 'river gravel' context.

Other finds from Coygan Cave include a sub-triangular handaxe of white recrystallised rhyolite[13], a recrystallised rhyolite flake[14], and an unmodified orange-stained drift flint nodule. There is also a blade of unknown black material, in two pieces[15] with edge damage, and with the proximal and distal end missing. It is possibly of Upper Palaeolithic age.

Uphill Caves – Mousterian and Early Upper Palaeolithic.

The Uphill Quarry is in a Carboniferous limestone outlier of the Mendip Hills, south of Weston-Super-Mare, and near the palaeontological site of Brean Down. Since 1898 a number of caves and fissures were both discovered and destroyed in the process of working the quarry which is now derelict (Harrison 1977,233). There were thirteen small caves in all, which yielded fauna and Roman remains. The only Palaeolithic flints were mostly Mousterian implements, from a 2m thick cave earth in Uphill 8 (Harrison 1977,242). Today, the old cliff face continues south of the quarry for at least another 100m and is largely covered by hillwash and shrubby trees. It is possible that undiscovered and unexcavated caves still exist there.

Edward Wilson carried out excavations at Uphill on behalf of the Bristol Museum in 1898. After his death a committee continued excavation until 1901. During this period four caves were investigated, the lithic finds and faunal material being now at North Somerset Museum Service in Weston-Super-Mare; Bristol City Museum, and the British Museum.

The material at Weston-Super-Mare is divided into two collections, the G. S. Weare Collection[16]; and the Montague Porch Collection[17]. The Museum register gives Uphill Cave 3 as place of origin for the Porch collection, implying that the collection comes mainly from the 1898-1901 excavations. Jacobi dates all but one piece of the Weare collection to Mesolithic or later, and suggests that the material may have come

[13] Acc. No. A76.1076
[14] Acc. No. A74.4403
[15] Acc. Nos. A76.455 and 453
[16] Acc. Nos. 1901.16 - 1901.29

from several unknown sources, probably open-air finds from ploughed land in chalk terrain. A newspaper cutting (unknown source, October 1901) supports this, saying that the flints and stone were 'found in excavation on the hill adjoining the caves.' The collection includes four large flint nodules with brown cortex, probably beach pebbles as chattermarks are present on two of them. They are similar to the split pebbles from Paviland which I have described above as Mesolithic.

The Uphill 8 material has several items associated with a Devensian fauna which can be assigned with confidence on typological grounds to the Upper Palaeolithic. It is worth noting that, almost without exception, they are made of good quality flint in contrast to the Mousterian material from this site, which includes a small subtriangular chert handaxe[18] and a chert Levallois point[19]. The handaxe is similar to that from the Hyaena Den, Wookey Hole (Tratman *et al.* 1971,260).

The only definite Early Upper Palaeolithic find from the site is a fragment of a leaf point[20]. It is a piece of flint blade patinated grey-white. Both dorsal and ventral surfaces have typical flat scalar retouch. Along both edges of the blade there is distinctive bruising due to use. This piece is very similar to the example from the Hyaena Den[21], described as a lame mâchurée (Tratman *et al.* 1971,262), and to the most complete Paviland example[22].

The four flints from Uphill 8 which were illustrated by Garrod (1926, Fig. 22) are no longer in the University of Bristol Spelæological Society Museum, having been destroyed in the Bristol 'blitz' during the Second World War. If the illustrations are to be believed, these were fascinating fragments of flint blades which have largely unretouched surfaces, but with areas of very fine scalar retouch over the ends of both surfaces to produce points, or in one case a platform for a burin removal. The consensus seems to be that they are pieces of Early Upper Palaeolithic implements, probably from the leaf point phase.

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[17] Acc. Nos. 1903.21.1-2 and 1990.1
[18] BM Acc. No. p1919.12.27.70
[19] BM Acc. No. p1919.12.27.71
[20] BM Acc. No. p1919.12.27.73, illustrated in Harrison (1977, Fig. 62).
[21] OUM Acc. No. S288
[22] OUM Acc. No. S420

There are no definite Aurignacian II types, but the 'burin' and blade fragments could well be Early Upper Palaeolithic, even if subdivisions cannot be made. Uphill 8 is an important site to bear in mind when looking for comparisons with Paviland. Although there are no absolute dates from Uphill, it may on typological grounds, have been occupied contemporaneously; it was approximately 50 miles away, facing towards Paviland, on the opposite side of the Bristol Channel Plain, equidistant between Paviland and Wookey. Although fragmentary, the fauna is also similar, (and also similar to that from the A2 'loamy cave earth' of Kent's Cavern) with thirteen species present including mammoth, woolly rhinoceros and reindeer. It is not known whether any of these are cut-marked and further research on the Uphill fauna may well be worth while. However, Uphill 8 shows similarities with Paviland in another, more unfortunate way. There is little hope of reconstructing the very disturbed deposits of Wilson's 1898 excavation. The cave earth was 2.0-2.5m thick, and although a stratigraphic sequence of some sort existed, Wilson noted only the layers in which finds occurred, and not their positions within the layers. The cave had been destroyed completely by 1901, and no field notes remain.

Eastington Pit – Creswellian?

Campbell (1977,146) included 17 flint artefacts from the Clifford's Bed III gravels of Eastington Pit, Gloucester; and an ivory point from Barnwood or 'Forty Acres Field Pit ' in the context of his Earlier Upper Palaeolithic subdivision. The flints were regarded as indicative of a small, open air encampment in the area of the find spot, and his opinion has been followed by other writers (Morrison 1980). No ^{14}C determinations have been made of relevance to flint assemblages from the site (Saville 1984) although a mammoth tusk without archaeological association from gravels at nearby Little Rissington is dated to 34 500 ± 800 BP (Birm 466). A woolly rhinoceros tooth found in Eastington Pit in 1934 is now in Stroud Museum[23] along with two *Bos* sp. bones and an *Equus* sp. tooth. None of these has been dated and it is not clear whether they were associated with lithic finds.

[23] Acc. No. 1950:136

There are two blades[24] from Eastington Pit, found respectively in December 1929 and April 1938. The first is an elongated blade, deeply patinated cream-white and grey, with nibbled retouch which is not sufficiently typologically distinctive to be accepted as certainly Early Upper Palaeolithic. It is 138 mm length, of curved profile with the proximal end missing, and the distal tip has also recently been broken. It was found in the gravels at a depth of 2.6m by the site foreman, Mr. G. Weaver (Gardiner 1932,163). There appears to have been confusion as to whether the blade had been modified into a lateral burin but on close examination I believe this is not the case. The dimensions of this blade are much larger than any from Paviland, and many previous removals give it an irregular cross-section. It is similar to those from Three Holes Cave, Devon, which are Creswellian, dated to c.12 000 BP (Barton & Roberts 1996,253).

The second blade was described by Burkitt (1938,287); it is a lightly white patinated blade of dark grey flint, length 89 mm, with convergent, sub-parallel end-scraper retouch on the proximal end, resembling that of the Cae Gwyn endscraper and some examples from Paviland[25]. The bulb of percussion is small, and a notch on the left side results from post-depositional damage. The retouch is extensive, and looks Upper Palaeolithic, but unfortunately its fresh condition gives grounds for doubting its affinity with Early Upper Palaeolithic flintwork (Darvill 1987,20). Burkitt (1938,297) goes so far as to say that if this tool was found on the surface, and with the usual Cotswold industries, it could be classified as belonging to an early metal culture.

From a typological and technological viewpoint both of these pieces could be Upper Palaeolithic. In my opinion they are closer to finds from Creswell or Cheddar, than those from Paviland or Kent's Cavern. The longer blade especially could be Late Upper Palaeolithic, but there is no case to be made for either to be from any phase of the Early Upper Palaeolithic.

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[24] Acc. Nos. 2012 and 3079 in Stroud District (Cowle) Museum (during November 1996).
[25] For example Swansea Museum Acc. No. A909.1.10

Cameron Road – Leaf point phase?

Campbell describes this single piece[26] as a thin bifacial leaf point or 'Blattspitze ' 'not very unlike some of those from the Altmühlgruppe at Mauern II' (1977,150), which would date it at about 38 000 BP. He compares it with a very similar point from Fir Hill, suggesting that both may be either Late Mousterian, or Early Upper Palaeolithic.The piece is also illustrated by Palmer (1970,100) who regards it as 'of uncertain cultural classification'.

The leaf point formed part of the Herbert Druitts collection, and is otherwise undocumented. It is made on a large flake of blue Portland chert, 15 mm thickness in the centre tapering to 5 mm thickness at the ends, There is some shattering on the right distal end of the dorsal surface, probably due to a natural flaw in the material. The edges of the piece are well-defined and there is no damage which could be attributed to the effects of water rounding or cryoturbation. The cross-section is semicircular, the ventral surface flat, and the profile slightly twisted. Length is 70 mm, width is 40 mm.

Flat bifacial flaking occurs from all edges, and is not confined to the ends. The piece has an almond-shaped rather than a roughly straight sided outline and is made on a large flake, not a blade. All that is known about the context of the piece is that it was collected in 1913 from a working on Cameron Road, in Purwell, Dorset. Other Purwell finds from 1913 include Bronze Age pottery and a bronze palstave although they are not necessarily from the same find-spot. Similar points occur in Neolithic assemblages, for instance at Hurst Fen (Clark 1960,221), Bishopstone in Sussex (Bell 1977, Fig. 9:1), and smaller examples occur in the early Bronze Age as at Winterbourne Stoke round barrow (Saville 1980,13). Clark states that their asymmetrical form and the absence of an acute point argues against the use of at least the majority of his 18 Neolithic bifaces as projectile heads (1960,223).

I would personally regard this artefact as a Neolithic or early Bronze Age 'knife', as indeed it is recorded in the unpublished catalogue of Bournmouth antiquities (Vol. I.,146).

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[26] This find is no longer in the Red House Museum, Christchurch; it is now kept in the Hampshire Museum Stores, Winchester. Acc. No. 23.1.1913 NVIII.I

Fir Hill – Leaf point phase?

The second leaf point which Campbell gives as a southern English open air find comes from Fir Hill, Fovant, Wiltshire, and is listed as being in the Salisbury and South Wiltshire Museum. (1977, Fig.109). In a visit to the museum I was unable to locate the flint point which Campbell describes but the numerous other lithics in Engleheart's collection are of Neolithic character (round scrapers and leaf arrow heads).

Study of Engleheart's report (1923,144), which also provides an illustration of the piece, suggests that it is older that the accompanying finds but the authors give no reason for this conclusion other than the unfamiliarity of the form to them. My opinion is that is probably Neolithic in date, but unfortuately the piece is no longer available to the researcher.

Ravenscliffe Cave – Leaf point phase?

A single find from Ravenscliffe Cave in the Derbyshire White Peak district, widely referred to as a Mousterian side-scraper, is in the Buxton Museum[27]. It is dated 1905, earlier than the main excavations carried out by Storrs Fox in 1910.

Campbell describes this object as a leaf point and includes it in his Early Upper Palaeolithic gazetteer. It is ovoid in shape, of grey-brown flint which is lightly white patinated and measures length 89 mm, width 45 mm and thickness 16 mm. The piece has steep, invasive retouch over all the dorsal surface and an arched, slightly twisted profile.

Again, it is doubtful that this is an Early Upper Palaeolithic leaf point, and still more unlikely that it is a Mousterian scraper, given its general association with early Bronze Age artefacts (including gold rings) from Ravenscliffe, its lack of patination and similar morphology to the Neolithic and early Bronze Age ovoid knives described above. It should not be included in a Early Upper Palaeolithic catalogue.

The first conclusion to be drawn from the above review is that aspects of the British Early Upper Palaeolithic merit critical review; particularly open air and single finds such as Cameron Road and Ravenscliffe Cave. However, three open air sites in the south of England are more widely accepted. These are Pulborough (Jacobi 1986,62), Bramford

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[27] Acc. No. 9581

Road and Constantine Road, Ipswich (Moir 1938,258). These yielded leaf points deeply buried in Devensian gravels, and in the case of the Pulborough collection - which comprises 198 flints - blade cores and trimming flakes were also found.

Paviland Cave should have a central place in the British Early Upper Palaeolithic. The lithic finds from Paviland compare well with those from all other British Early Upper Palaeolithic sites. The sites which would repay a closer examination with respect to Paviland are the Uphill Caves (especially any records which can be found relating to Uphill 8), Kent's Cavern, and the Hyaena Den. These, along with the Badger Hole and Soldier's Hole are able to supply a basic stratigraphy into which dates can be fitted.

I believe that with more time spent on becoming versed with the details of the sites above, case-studies and patterns could be proposed much like the one given by Campbell for intrasite variability at Kent's Cavern. At present such studies would be decried for lack of background and solid evidence. This review of the British Early Upper Palaeolithic has made a preliminary attempt to pin down tool types to known dates, and three recommendations can be made for further work:

1. Tool types may present non-functional style (Sackett 1977) and therefore investigations can be made into cultural and even individual stylistic choices in the Palaeolithic.
2. Very strict criteria should be used in deciding the typological affinity of open air finds or badly provenanced pieces.
3. Dating is of the utmost importance if sites are to be compared more thoroughly than in the above synopsis. The main factor holding archaeologists back from a more adventurous explanation of the British Upper Palaeolithic is a lack of resolution and clarity in stratigraphy.

Datable material can be recovered in two ways, firstly by new excavations in old and mostly 'emptied' sites, or in newly discovered sites. This seems unlikely to be highly productive owing to the extent of nineteenth century 'cave hunting'. Open air sites may be discovered in the coming years but, unfortunately, archaeological access to deep soundings (for example foundation digging as part of building schemes) is often limited. The second route to obtaining new dates is that pursued successfully by Campbell for Kent's Cavern - a painstaking sifting through diaries (such as Pengelly's and

Armstrong's) and excavation reports, with an aim to making associations between diagnostic tools, or idiosyncratic common forms; and organic material for radiocarbon analysis. Worked and cut-marked bone could be directly dated, to provide a range of dates on which the site and region was occupied and to further define any hiatuses in occupation. Stratigraphical sequences would be open to review in the light of evidence from new excavations, and inaccurate plans of old sites (such as Paviland) should be redrawn.

Use of a range of dating techniques would overcome the inaccuracies inherent in the radiocarbon technique. Burnt flint can be dated directly by thermoluminescence (TL), in-situ sediments by optical luminescence (OSL), teeth by electron spin resonance (ESR); and stalagmite (which often seals layers, such as in the case of Kent's Cavern), can be dated by Uranium series and TL. A new series of absolute dates, together with an interpreted compilation of all known dates would indicate when (or before when in the case of minimum ages) sites were occupied, and the temporal extent of the cultural groups which visited Britain. It would then be possible to link contemporaneous sites together, and produce models, possibly with ethnographic parallels and palaeoecological reconstructions, of human habitation patterns.

It is becoming increasingly clear that the British Early Upper Palaeolithic is not a homogenous phenomenon, but consists of episodic occupation. There may be differences in terms of faunal associations, geographical variations within the groupings, and differences in habitation strategies, to give but three examples. Continuities as well as differences can be highlighted, for example the tradition of red ochre burials which continues throughout the Early Upper Palaeolithic.

A clear sequence for the British Early Upper Palaeolithic should be taken in conjunction with the new data currently being generated from ice core studies (Mellars pers. comm.) More exact ecological and topological models can be generated for the mid- to late-Devensian. This would be of particular relevance in dealing with sites which are currently bordered by the sea, like Paviland and Uphill, which require a stretch of the imagination to situate on the Bristol Channel Plain.

The finds from Paviland are testimony that the scale and duration of British Early Upper Palaeolithic settlement was hardly inferior in comparison with the French and

Belgian sites. The following section will describe some of these sites, and the ways in which Paviland lithics are similar to those from the Continent.

Fig. 5.3: Estimated nearest primary sources of raw materials in the Paviland Cave collections (after Jenkins 1997).

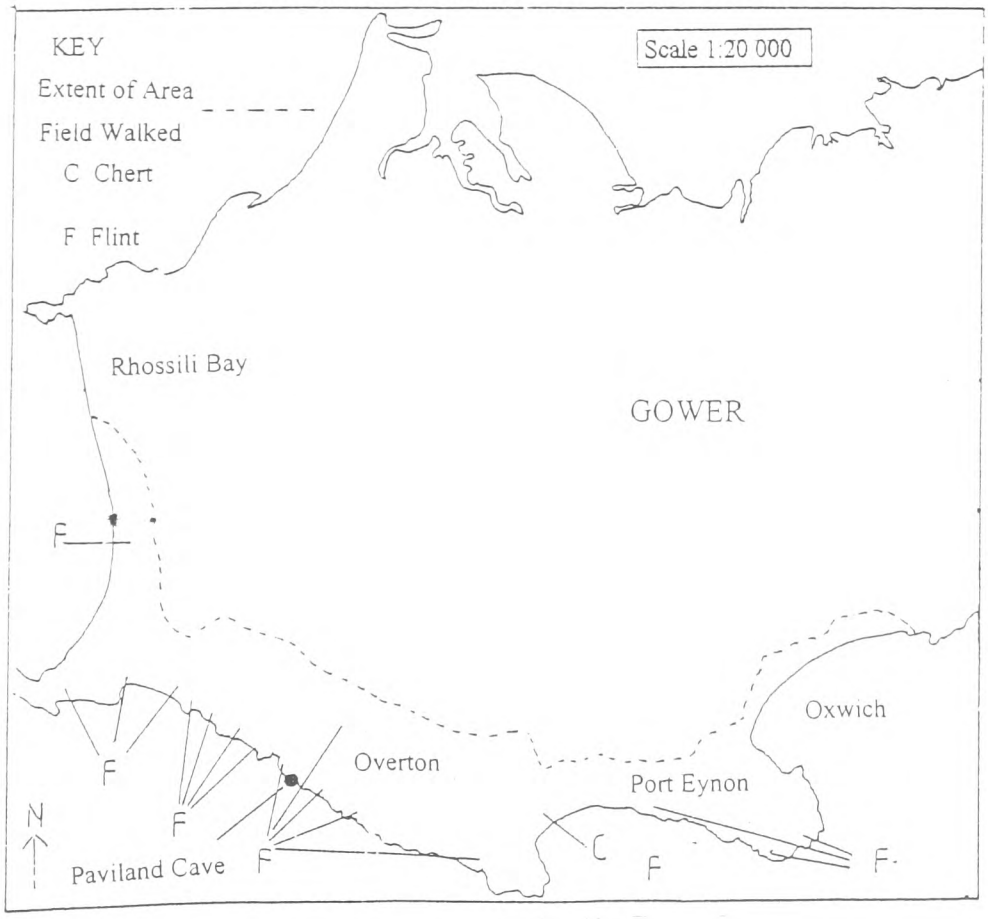

Fig. 5.4: Areas fieldwalked and raw materials found (after Jenkins 1997).

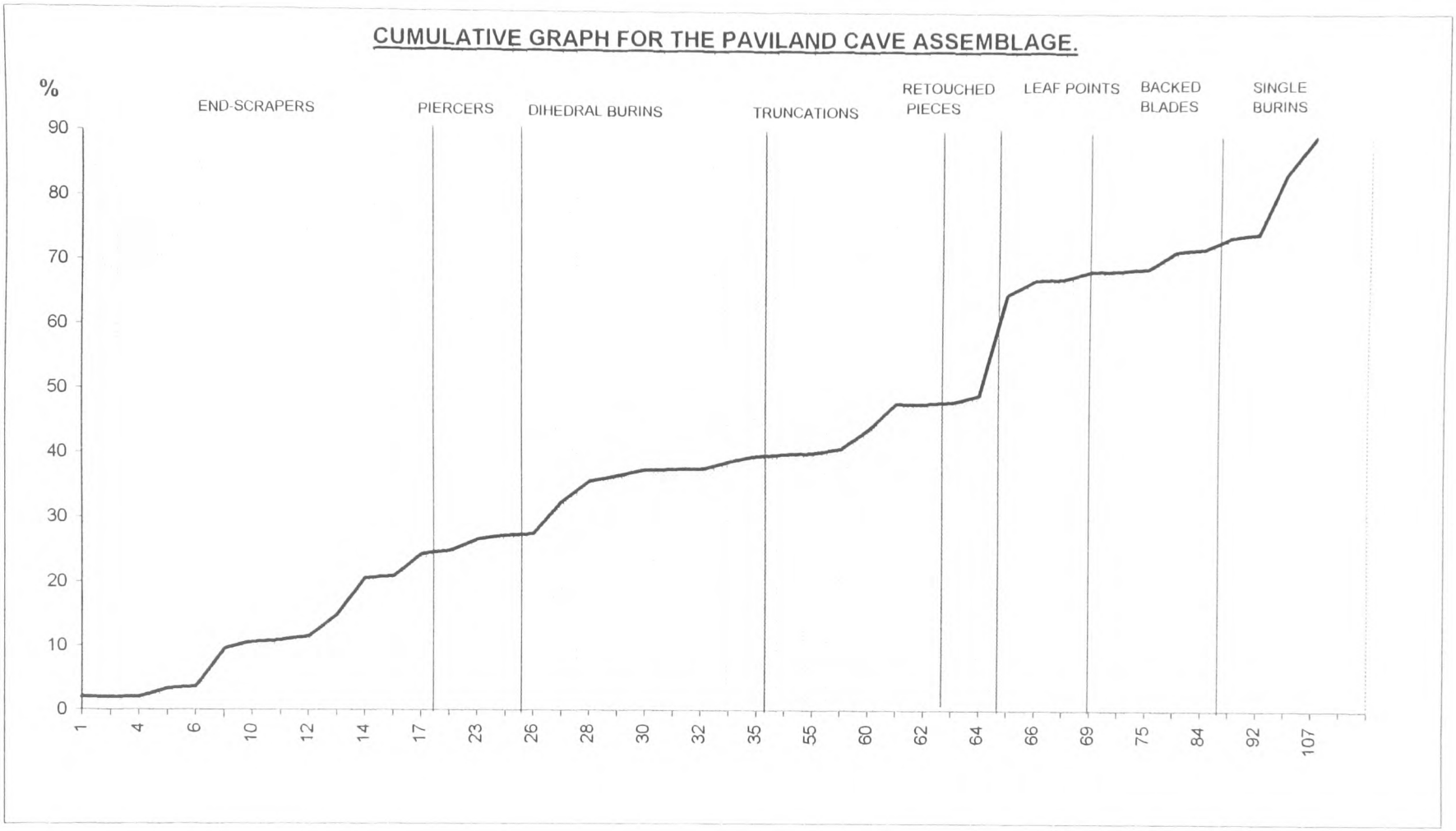

Fig. .5.5: Cumulative graph for the Paviland Cave assemblage (all collections).

5.4: Paviland in Palaeolithic Europe.

This section will examine some of the interpretations of Paviland Cave, past and present. Questions to be addressed are: should the scale of Paviland set it apart from other Early Upper Palaeolithic sites in Britain; and how should Paviland be assessed in the context of the range of known European Early Upper Palaeolithic sites? Interpretation is synonymous with characterisation, as archaeologists have considered the site both in terms of the state of knowledge of their time, and their personal preferences. This involves selecting attributes of the site for further consideration and disregarding others. Interpretation cannot be objective; indeed, the descriptions of Paviland which the archaeologist has to work with as primary evidence are themselves far from objective reports.

The French sequence has provided the base-line for the European Upper Palaeolithic, particularly the painted caves and archaeological wealth of the Dordogne area. Excavation techniques pioneered and perfected within the French caves have long provided the bench-mark by which field projects are measured, and the subsequent interpretation of French sites has 'provided a cornerstone' (Charles 1996c,982) of European Palaeolithic archaeology. The north-west European sequence was considered peripheral, and, presumably with a low population density, a poor relation of its classic French counterpart. It was thought to lack detailed stratigraphic sequences and artistic - hence cultural - complexity. As absolute dating begins to reinforce typological correlations, the Palaeolithic of north-western Europe can more readily be investigated in its own right. The emerging picture is one of highly punctuated human settlement throughout the Upper Palaeolithic, in periods of climatic amelioration. Paviland and probably the related Gower sites could result from one of these small scale episodes of settlement, perhaps of short term visits spanning only a few weeks or months. The bulk of the Paviland lithics may well be a relatively pristine archaeological accumulation deposited in the course of a few weeks.

Two comparable European sites, the Abri Pataud and the Trou Magrite, will be reviewed below, and hunter-gather strategies and the application of ethnography will be briefly considered. It will be seen that Paviland is a site of high importance, with as much

to offer the future researcher as the Upper Palaeolithic caves in Belgium recently re-evaluated by Straus *et al.* (1996).

The Abri Pataud (Dordogne, France) is a large rock shelter overlooking the Vézère valley, situated at Les Eyzies, about 100 km east of the Atlantic coast. It was excavated by Movius from 1959-1965 and its sequence can be related to an important suite of caves and rock shelters including Lascaux, La Ferrassie and Laugerie. It is the best dated Upper Palaeolithic sequence in Europe, with accelerator dates which appear older than the majority, because they are less contaminated. The deposits had a total depth of some 9.25m with a very active and diverse sedimentary history. Fourteen major horizons corresponding to human occupation periods are recognised. These fine-grained horizons; designated as 'levels' contain numerous artefacts and fossil bones. The manufactured tools represent a 'virtually complete Early Upper Palaeolithic succession' (Movius 1975) from the Basal Aurignacian to the Proto-Magdalenian. The majority of the fauna is reindeer (*Rangifer tarandus*) with a frequency of 80-90%.

The numerous ^{14}C age determinations for the period from 34 250 ± 675 BP (GrN-4507) to 20 400 ± 450 BP (OxA-373) (El Mansouri *et al.* 1996,803). The nine basal levels (14 to 6) are Aurignacian and, in comparison with the rest, not very rich. Level 14 corresponds to the basal Aurignacian with ages of 33 330 ± 410 (GrN 720) and 34 250 ± 675 (GrN 4507). Level 5 is Gravettian; by this time all Aurignacian types are gone and the industry is dominated by Gravette points, large flake-scrapers and fléchettes. These are not found at Paviland.

Layer 6 and the lower part of level 5 have produced some apparently erroneous dates (El Mansouri *et al.* 1996,805): for instance level 6 has yielded a result of 24 340 ± 700 BP (OxA 582) in conflict with a stratigraphic position suggesting an age older than 28 000 BP. Taking aspartic acid racemisation dates in conjunction with accelerator ^{14}C dates, El Mansouri *et al.* have recently suggested an age of about 29 600 BP for layer 6 (Evolved Aurignacian) and 30 400 BP for the sample of the level 9 (Intermediate Aurignacian). These two figures are younger than the ages estimated by Movius (1977), in which Level 6 was equal to or greater than 31 500 BP, and Level 9 approximately 32 700 BP. Level 4 is Noaillian, (25 000-27 000) with Noailles burins and characteristic

sagaies d'Isturitz. Level 3 is Perigordian VI (23 000-22 000) with small Gravette points. Level 1 has been dated to 20 400 ± 450 years BP (OxA 373).

Roe (1986,2) has advised that archaeologists should not look to the 'classic' Upper Palaeolithic area of southern and south western France as a major comparative area for the British material. McBurney had much to do with turning attention eastward to northern France, Belgium, Holland, and the countries of the North European Plain at least as far as Poland. The Trou Magrite is a site in the Ardennes area of Belgium which is roughly comparable to Paviland in size and artefact yield. The cave is situated in the valley of the river Lesse, within a cluster of cave sites which have provided Upper Palaeolithic and Mesolithic material. It was first investigated in 1866 by Edouard Dupont and is one of the few sites in the area to contain multiple Palaeolithic occupation horizons which span most of the late Pleistocene, and also to have yielded mobiliary art (pierced teeth and ivory beads).

The Universities of Liège and New Mexico have lately conducted excavations (1991 and 1992) which have revealed areas of *in situ* sediment, and a thorough site report has been published (Otte & Straus 1995). Other recent re-evaluations include the Trou de Chaleux (Otte 1994), Gough's Cave at Cheddar (Currant *et al.* 1989) and the Hyaena Den, Wookey Hole (Jacobi & Hawkes 1993). One interesting study detailed in the Trou Magrite report is the analysis of organic residues on lithics, recovered during the course of the excavations - the results indicate traces of bovine, lagomorph (hare/ rabbit) rodent and human blood protein residues. Similarly, the thin sectioning of a range of ungulate teeth gives firm evidence for the winter and early spring exploitation of species such as ibex and reindeer in the Lesse valley; supporting the hypothesis that these were seasonal sites in a nomadic group's large yearly range. If a similar study could be carried out on Paviland, with results indicating a summer occupation, we would be vindicated in drawing close parallels between these two sites.

Leaving aside Buckland's (1823) ascription of Paviland to the Roman era, the site has been given several different characterisations within the Early Upper Palaeolithic; such as 'ivory workshop' (Sollas 1913), 'burial chamber' and 'base camp' (Campbell 1977). Campbell's study had an overtly processual theoretical stance. He regarded

Paviland as a base camp or base site with a 10 km radius catchment area, and describes it as a 'centre'. Considering how much evidence has been lost, both within the site and in the surrounding landscape, such a statement is difficult to substantiate. That Paviland was the centre of the most intense Early Upper Palaeolithic activity known thus far in Wales, if not in the whole of Britain, is not denied, but interpreting it as a base camp involves a series of assumptions about Early Upper Palaeolithic human behaviour which are not justified. Firstly a base camp implies lengthy occupation, and presumably repeated occupations by the same group, within their home range. The length of occupation is relative, and a 'long' visit may only be a couple of days. However it should be noted that the short occupation sites which Campbell uses as comparisons, for example Nottle Tor, are not *in situ* accumulations of dateable material. In Campbell's model they would be regarded as specialist satellite sites around the base camp. If this model is accurate, any certain examples of satellite sites are lost. Indeed, Paviland itself might be regarded as a specialised (ivory working) site. Moreover, a base camp with a 10 km catchment area is not appropriate in terms of lithic raw materials, which may have travelled 150 km (Section 5.2). The fauna provides no evidence as yet for distance travelled, but the *Nerita* sp. shells with the burial may have been transported from the contemporary coastline, perhaps 40km west of the site.

There are five other caves in the immediate vicinity of Paviland (Gower caves); four of which have produced Early Upper Palaeolithic material, but cannot realistically be connected with Paviland. They are Long Hole, Nottle Tor, Deborah's Hole, Cat Hole and Bacon Hole.

Long Hole: (O.S. SE 452851) Long Hole is easily accessible in the cliffs halfway beyond Paviland and Port Eynon point, 43m above high water mark and 55m O.D. The entrance opens directly into a single passage which slopes upwards for about 15m.

The first excavations at Long Hole were carried out in 1861 by Col. E. R. Wood, who discovered the cave earlier in the same year, and H. Falconer. A small assemblage of flint and other artefacts was found in the cave earth at a depth of about 1.4m (Campbell 1977,59) and at a distance of roughly 1.8m from the entrance. Garrod suggested, on the basis of a well-made end-scraper, a burin in chert and a rough carinated scraper in flint,

that the assemblage may be 'Middle or Upper Aurignacian' (Aurignacian or Creswellian) in age (Garrod 1926,66). Campbell's excavation of Long Hole in 1969 (Campbell 1977,58) retrieved three undisturbed fragments of thin flake debitage, which he considered to be Early Upper Palaeolithic, firstly because they were found below what proved to be a Devensian layer (1977 II, Fig. 65) and, secondly because they included the medial portion of a prismatic blade. Campbell suggests that the flakes may have resulted from the manufacture of a leaf point, as they are thin and curved, but this possibility cannot really be substantiated.

Nottle Tor: (O.S. NE 453939) was a rock fissure on the north side of the Gower, completely quarried away in 1869. The Swansea Museum has a single lateral burin on a straight truncation, and a possible leaf point 'made on very cherty flint' (Campbell 1977,152) from this site. The leaf point is bifacially worked, but more thoroughly on the ventral surface. It is very small compared with the Paviland, Kent's Cavern and Pulborough examples.

Cat Hole: is located in a small cliff in a dry wooded valley to the north-west of the village of Parkmill (O.S. SE 583901). The cave has two entrances, a smaller one which faces south-west and a larger entrance facing west-south-west; both command a good view of the narrow valley, the cave being about 10m above the immediate floor of the valley and at about 30m O.D. (Campbell 1977,55). The first excavations at Cat Hole were carried out primarily at the mouth of the larger entrance and inside the chamber by Col. Wood about 1860; and no stratigraphy was recorded. Garrod illustrates (1926, Fig. 9) seven implements which she assigns to the Magdalenian (Creswellian).

Campbell (1977,31) gives a definition of home range based on the ethnographic example of the !Kung bushmen: home range is a 10 km radius (or two hours walking) from the main site used in a given season, month or day. The area within that radius would be the site exploitation territory. The territory would have at least one main occupation site, or 'home base', and probably more than one secondary or 'transit' site. A base site would be the main focus of exploitation activity and, assuming the lack of clearing the site, would have relatively dense occupation debris. A transit site would be one of a number of

strategically placed subsidiary sites generally within the 10 km range of the base site if related to it, and beyond if concerned with migration between base sites. A transit site would have relatively little occupation debris and - according to Campbell (1977,31) - could be simply a find-spot of a single implement. Finally an 'annual territory' would be the total area exploited by a human group throughout a given year; containing one or more site exploitation territories. Hunter-gatherer territories seldom exceed 100-200 km across. The annual territories would fall within such areas, perhaps having a radius of no more than 50 km. In a number of typical hunting societies the average composition of the band is 25 persons (Yellen 1976), and half of all hunter bands do not exceed 50 persons at any time of the year. Others coalesce during the season of plenty but are normally less than 50 at other times.

Rather than producing a predictive or comparative model, the theoretical side of Campbell's (1977) work is an attempt to make archaeological evidence fit an ethnographic pattern. In the case of research into the British Early Upper Palaeolithic, taphonomic factors and variations in preservation conditions should be of greatest importance. It is not possible simply to note these, remove their influence and reach an understanding of the underlying original patterns of behaviour, as their effect is so pervasive. Ethnographic accounts cannot be used to match and highlight a specific archaeological patterning, since many patterns of behaviour are possible with the present evidence.

In processual theoretical studies, Early Upper Palaeolithic environments, like those of Eskimo hunters, are expected to impose high-level constraints on behaviour and offer little guiding information (Gamble 1983). Penalties for incorrect decisions would be prompt and drastic - the key to minimising such risks is precise, accurate information about the environment and its resources, together with a social strategy allowing such information to be rapidly disseminated among individual hunters. Campbell does not allow for the fact that the extreme mobility of some groups could be conditioned by the need to reaffirm social ties, rather than arising as a result of ecological imperatives. Even if this were the case, it must be recognised that the pattern of alliances provides a convenient framework for social visiting and the dissemination of information about a

range of subjects, including the environment and available resources. On the other hand, Otte (1990) negates climatically deterministic explanations for the reoccupation of the north-western plain in favour of purely cultural ones.

Binford (1980) outlined two extremes in the spectrum of hunter-gatherer subsistence strategies, which help to pinpoint the problems in Campbell's interpretation. They are foraging and collecting. Foraging is characteristic of desert or semi-desert environments and involves a great use of plant foods such as nuts and berries, which may be widely available but take a considerable time to gather and process in sufficient quantities. Foraging is exemplified by the !Kung San, and therefore this group should not be used to provide cultural analogies with European Early Upper Palaeolithic populations; the !Kung San's tropical environment and plant food resource base make them *in*comparable. Collecting on the other hand is characteristic of high latitude environments, with a dominance of mobile animal resources as exemplified by the Nunamiut Eskimo.

Foragers depend upon encounter strategies in which food is gathered daily from a residential camp. Variations in food supply are accommodated by consumers moving to resources. This results in frequent residential moves and adjustments in group size. Mobility is very high although the spatial area of the annual territory around which groups move may be fairly compact. Amongst collectors the principal strategy is to move resources to consumers. Resources are intercepted rather than encountered involving a logistical strategy wherein considerable effort is invested in planning ahead.

Critical resources, such as caribou for the Nunamiut or salmon for the Tlingit (north-west coast American Indians), are often only available for very brief periods resulting in time-stress. Time-stress has repercussions for the organisation of technology and makes storage a basic element of such intercept strategies (Torrence 1983,13). The residential base is moved less frequently over the course of the year. Small procurement parties set out to acquire specific resources and may not return on a daily basis; on such trips the environment is being constantly monitored. The hunters associated with a residential camp will cover a very large territory.

According to Binford, these two strategies result in different settlement types. Foragers create sites classified as residential camps and procurement locations while collectors add to these a further three types; field camps, stations and caches. Factors of artefact-deposition and site-formation are also expected further to differentiate these settlement types within their respective settlement systems. The applicability of this and the 'home base' model used by Campbell assumes that the archaeological remains relate to aspects of a complete settlement record. This view implies that, within a large geographical region such as Britain, we should discover a series of home bases which served as foci within seasonally contrasted exploitation zones. However, Binford's collector-type settlement systems show that logistical principles of organisation result in a highly differentiated pattern of environmental exploitation and, therefore, site formation. Over several thousand years the pattern will become even more confused.

Early Upper Palaeolithic characterisation of hunter-gatherer strategies and the corresponding nomenclature and theoretical treatment of sites does not change for the Late Upper Palaeolithic (Campbell 1977,166). Throughout the Late Upper Palaeolithic there are only two sites in Gower - Cat Hole and Paviland - with sufficient finds to be designated as 'base camps'. It would be interesting to investigate why this area seems to have less occupation during the Late Upper Palaeolithic. Perhaps the large mammal herds preyed upon by Early Upper Palaeolithic hunters, leading to high occupation during Aurignacian/Gravettian times, had by this time changed migratory patterns, and so the area was not as useful, the density of occupation shifting instead to the Wye Valley and Mendip areas.

Although Campbell gives no data on sea levels, or for the composition of the faunal assemblage, he suggests that Cat Hole may have been used for inland exploitation and Paviland for concentration on the resources of the Bristol Channel Plain. These two sites are nearly within 10 km of each other and may have been used simultaneously, as together they would have given the hunters an increased advantage over the surrounding territory; this is, however, impossible to prove or disprove.

The home base/home range model is restrictive, leading Campbell to explain the presence of fossil shells from East Anglia, found in Spy Cave, Belgium, as 'trade',

whereas they could have been transported by a single group with a much wider annual territory than he allows. These fossil shells, *Nassarius reticulatus* and *Trivia coccinelloides* were found by Dewez during the 1958 excavations at Spy Cave. They have no humanly-made markings but could have been suspended by natural perforations, a possible reason for their selection. It is not clear which Early Upper Palaeolithic layer (Perigordian or Aurignacian) they originate from; but they may be associated with a ^{14}C date of 22 105 ± 500 BP (IRPA-132) (Otte 1977). The nearest source of these shells is the Red Crag/Norwich Crag deposits in south-east Anglia and it is assumed that they had been transported by hand from there. Exchange networks are possible, but the hypothesis is that contact between groups, if not the range of a single group, spanned a greater distance than 10 km.

Gamble (1983,211) suggests that an area such as south Wales could represent the outer limits of an exploitation zone of groups, whose residential camps lay well outside the area; and the settlement traces for the Early Upper Palaeolithic therefore represent only a partial settlement record. The lifetime territory size of a modern group of Arctic hunters is 120 000 km ^{2} (Binford 1983), whereas the area of England is only 130 439 km^2; and the area of England and Wales combined is 151 207 km ^{2}. Residential camps could, therefore, easily be missing from the archaeological record with such a large geographical scale. During warm periods specialist work camps could have been created in the area, but in stadial conditions these would have to be made, if at all, for very specific purposes.

Perhaps Paviland should be characterised as a warm period specialist camp: for example, to work ivory present in natural accumulations in the cave or nearby. The site would have also been attractive to Palaeolithic peoples if it was known that flint and chert from previous occupations could be found there and re-worked, as could ochre, bone, and ivory. A new model is needed, one which incorporates ethnographic detail only where it can be fairly applied. Unfortunately such a model cannot at present move beyond a general picture of small, highly mobile and migratory groups of hunters in a steppe or tundra environment. Brief use was made of caves and open air sites, and, depending on the precise Early Upper Palaeolithic phase, one would expect great

seasonal variation perhaps including an event of group convergence. There is no exact ethnographic or ecological parallel for the Devensian world today, but ethnography is still of use in that it supplies ideas and inspiration, rather than analogy. Sedentism is possible amongst hunter-gatherers with resources which are predictable on at least an annual basis, and a notional extended territory, the 'social territory'. A social territory allocates resources through the medium of reciprocity. The resources may be a whole range of commodities including marriage partners, a food supply that a group might require if their own should fail, or lithic raw materials (Gamble 1982).

For the future, it is important to recognise what constitutes productive and useful research both on the Paviland collection and on the British Early Upper Palaeolithic as a whole. No work on the European Palaeolithic can dismiss Paviland. If the Red Lady is placed with Aurignacian and Upper Perigordian burials known from Europe, the similarities can be easily seen. Moreover the similarities in implement types as discussed above (Section 5.1) are obvious. Paviland, has a series of idiosyncratic tool types which serve as a reminder that the site could be the base for one particular hunter-gatherer group, but which also suggest just how much archaeological information has been lost.

An understanding of the purpose of the ivory artefacts (rods and spatulae), shells and ochre associated with the burial is difficult to obtain. The function of these artefacts is an area for surmise rather than profitable enquiry. The symbolic connotations of ochre for example, are endless - blood-letting connected with hunting ritual, sexual symbolism (C. Power, pers. comm.), use as a pigment for painting or colouring clothes, or - mixed with fat - as a 'pomatum' for dressing hair (Sollas 1913). The practical uses of ochre are also manifold, for example its use as a tanning agent or 'certain protection against vermin' (Sollas 1913,373) could have led to a belief in its embalming properties. Additionally, the Red Lady burial as a single brief activity cannot provide much information about the nature of human behaviour in the Upper Perigordian, whereas the lithic implements have the potential to provide information about a much wider range of behaviour - for example distances involved in raw material transportation can be extrapolated to tell us about the size of group ranges.

Recommendations for future work would therefore include a more in-depth study of the origins of Paviland raw materials, whether mainly erratics (E. Jenkins pers. comm.) or the result of a distance trade/ exchange network. The limitations of Paviland as an un-stratified site must always be held in mind, however - the main difficulty being in the co-ordination of faunal, lithic and radiocarbon analyses (Aldhouse-Green & Pettitt 1998).

To conclude, when Buckland found the skeleton of the Red Lady he attributed it to the Roman era and assumed that all artefacts on the cave were associated with it. Sollas, a little less than a century later compared it with the evidence from Crô-Magnon and renamed Paviland an 'Aurignacian Station'. We are now clear that all phases of the British Upper Palaeolithic are present at Paviland, and it is hoped that the current programme of research has helped to unravel the story further.

Summary.

Paviland Cave is a major Early Upper Palaeolithic site, on account of the number and quality of lithic and ivory finds, and the presence of the 'Red Lady' burial. The cave is situated in Carboniferous limestone, on the south coast of the Gower peninsula, South Wales.

Early excavations failed to record or resolve questions of stratigraphy. The first was in 1823, by William Buckland, and the second by William Sollas in 1913. Sollas' excavations produced the majority of the stone artefacts, which are divided between six museums, the majority being in the Oxford University Museum and the National Museums and Galleries of Wales, Cardiff. Of these, four thousand are debitage and six hundred are retouched tools. Owing to the lack of stratigraphy it is impossible to associate pieces with each other, or with material datable by the radiocarbon technique. Therefore, the study has focused on firstly producing an illustrated catalogue, or list of all finds with appropriate measurements; and secondly, isolating chronologically diagnostic artefacts to compare with other, similar finds from sites with a better sequence of dates and recorded stratigraphy. There are ninety-eight diagnostic pieces.

All stages of the British Middle and Upper Palaeolithic are present at Paviland, with a Mousterian, Early and Late Upper Palaeolithic component of the assemblage, as well as Mesolithic. However, the site still remains primarily an Early Upper Palaeolithic site, with most of the evidence being for an Aurignacian II occupation, on the basis of busqué burins (of which there are 7) and nosed and shouldered scrapers (of which there are 38). Two of the busqué burins do not have retouched 'stop-notches', which makes them atypical. The prospect of finding atypical and idiosyncratic tools raises the possibility of variants within tool types becoming standard types in specific sites, a phenomenon which might well be expected from a geographically marginal site.

Appendix I: State of Curation of All Collections.

The way in which stone tools are stored varies from place to place, and has long term consequences upon the state of the collections. All the Paviland lithics seen are in good condition, and a description of how they are stored will be given below.

Swansea: The retouched pieces in Swansea are contained loosely in one large cardboard box, and the debitage (1909, Vivian Collection) in a smaller wooden box, within which they are layered with acid-free tissue. Approximately 10% of the pieces show signs of abrasion resulting from contact. All the tools (1836 Francis & Geffries Collection) are currently, or have recently been, glued to wood and cardboard and so are in need of display-curation in addition to re-labelling if they are to be displayed when the redecorated gallery is opened (summer 1997).

Ashmolean: The pieces in the Ashmolean (1948 A. E. Peake Collection) are also in a single cardboard box, with bone fragments; which are all individually wrapped in acid-free tissue.

Oxford University Museum: The finds in Oxford University Museum are in several varied boxes, and four drawers, in which they were in open contact with each other, within large plastic finds bags. Each retouched piece has now been individually wrapped in acid free tissue and bagged. The debitage remains all together in large plastic bags.

British Museum, Frank's House: The finds housed in the British Museum, Frank's House (Orsman Road) are in two drawers. The drawers are lined with polystrene and so the pieces are not in direct contact. There are two collections, one ascribed to Buckland (1946 7-1:2-5), and one from Sollas' excavations (Sir John Lubbock's Collection 1916 6-5:108-119).

All tools and debitage in the National Museums and Galleries of Wales, Cardiff, are individually packaged in clear plastic finds bags, and occupy three large boxes. There are 6 collections which include lithics attributed to the site. (98.18, 15.277, 24.94, 34.568, 50.406, 60.96).

Only Oxford University Museum and the National Museum of Wales have Paviland finds on public display (August 1996).

APPENDIX II: Catalogue of Finds.

NATIONAL MUSEUMS AND GALLERIES OF WALES: LIST BY ACCESSION NUMBER.

ACC. NO.	PREV. CLASS.	MATERIAL	PATINATION	RETOUCH TYPE	R. POSITION	PLATFORM TYPE	L/mm	W/mm	Th/mm	W/g.	TYPE	CLASSIFICATION
24.94/1	beaked/rostrate scraper	flint	deep patination	sub-parallel	direct	plain	23	14	10	4.2	13	thick nosed end-scraper (atypical)
24.94/2	_	flint	deep patination	sub-parallel	direct	dihedral	16	12	4	1	77	side-scraper
24.94/3	_	flint	deep patination	parallel	direct	plain	19	15	9	3.5	93	debitage
24.94/4	_	flint	deep patination	sub-parallel	inverse	flat facetted	43	50	13	27.6	93	debitage
24.94/5	_	flint	deep patination	none	_	flat facetted	50	32	12	24.7	93	debitage
24.94/6	_	flint	deep patination	scalar	direct	point only	38	33	15	13.8	93	debitage
24.94/7	_	flint	deep patination	none	_	plain	34	30	12	15.7	93	debitage
24.94/8a	Mousterian	flint	deep patination	sub-parallel	direct	plain	33	25	7	8	93	debitage
24.94/8b	hollow/ concave scraper	flint	deep patination	denticulate	direct	absent	44	24	11	14.2	77	side-scraper
24.94/9	scraper	flint	deep patination	denticulate	direct	absent	27	16	6	3.9	75	denticulate
24.94/10	_	chert	none	abrupt	inverse	absent	26	24	7	6.1	93	debitage
24.94/11	_	flint	deep patination	none	_	absent	19	25	12	9.9	93	core
24.94/12	_	flint	deep patination	sub-parallel	bifacial	absent	25	25	13	10.2	77	side-scraper
24.94/13a	Mousterian	flint	deep patination	sub-parallel	direct	plain	32	32	13	12.6	93	debitage
24.94/13b	Mousterian	flint	deep patination	none	_	dihedral	37	39	11	15	93	debitage
24.94/14a	_	chert	none	none	_	plain	24	13	8	3.8	93	debitage
24.94/14b	_	flint	deep patination	none	_	plain	24	33	8	7.3	93	debitage
24.94/15a	PseudoMousterian	flint	deep patination	none	_	plain	29	24	10	6.4	93	debitage
24.94/15b	PseudoMousterian	chert	none	abrupt	direct	absent	30	12	13	10.7	77	side-scraper (atypical)
24.94/16a	Mousterian	flint	deep patination	scalar	bifacial	absent	26	15	8	4.2	77	side-scraper (denticulate)
24.94/16b	_	chert	none	sub-parallel	direct	plain	31	25	9	9.2	77	side-scraper
24.94/17a	beaked/rostrate scraper	chert	none	sub-parallel	direct	flat facetted	25	20	7	4.3	14	shouldered end-scraper
24.94/17b	Mousterian	flint	deep patination	scalar	inverse	absent	34	24	13	15.9	93	debitage
24.94/18a	Mousterian	flint	deep patination	s-l-s-s	bifacial	point only	25	34	13	14.1	77	side-scraper
24.94/18b	scraper	flint	none	sub-parallel	direct	plain	22	19	9	6	93	debitage
24.94/19a	_	flint	deep patination	stepped scalar	direct	absent	27	23	11	7.2	93	single burin
24.94/19b	_	chert	none	sub-parallel	direct	absent	27	22	15	12	13	thick nosed end-scraper (atypical)
24.94/19c	_	flint	deep patination	sub-parallel	direct	absent	33	20	13	12.8	2	atypical end scraper
24.94/20a	Mousterian	flint	slight patination	none	_	point only	30	26	6	6.2	93	debitage
24.94/20b	Mousterian	flint	deep patination	scalar	bifacial	plain	23	14	15	5	93	debitage
24.94/21a	_	flint	deep patination	none	_	absent	40	37	22	39.9	93	debitage
24.94/21b	Mousterian	flint	deep patination	scalar	bifacial	absent	30	29	17	21.2	93	debitage
24.94/21c	_	flint	deep patination	none	_	dihedral	24	26	14	12.6	93	debitage
24.94/22a	PseudoMousterian	flint	burnt	none	_	plain	40	37	22	12.9	93	debitage
24.94/22b	Mousterian	flint	deep patination	abrupt	direct	absent	24	15	11	5	77	side-scraper
24.94/23a	PseudoMousterian	flint	deep patination	none	_	plain	37	23	12	10.3	93	single burin
24.94/23b	Mousterian	flint	deep patination	scalar	direct	absent	22	18	7	3.4	77	side-scraper
24.94/24a	_	flint	deep patination	scalar	direct	absent	21	27	8	4.7	93	debitage
24.94/24b	Mousterian	flint	deep patination	abrupt	direct	plain	22	19	8	4.6	93	debitage
24.94/25a	_	flint	deep patination	abrupt	bifacial	absent	25	28	5	3.2	65	piece with continuous retouch on one edge
24.94/25b	Mousterian	flint	deep patination	abrupt	inverse	absent	23	22	7	4	65	piece with continuous retouch on one edge
24.94/26a	burin	flint	deep patination	abrupt	direct	absent	22	18	5	2.7	65	piece with continuous retouch on one edge
24.94/26b	_	chert	none	abrupt	direct	plain	30	24	10	9.2	23	piercer
24.94/27a	PseudoMousterian	flint	deep patination	scalar	bifacial	point only	45	22	8	6.9	93	debitage
24.94/27b	Mousterian borer	flint	deep patination	abrupt	inverse	absent	24	13	3	1.6	23	piercer
24.94/28a	PseudoMousterian	flint	slight patination	none	_	absent	47	28	10	12.2	93	debitage
24.94/28b	_	flint	deep patination	sub-parallel	direct	point only	46	27	10	15.1	93	debitage
24.94/28c	_	rhyolite	none	scalar	direct	absent	19	11	3	0.9	65	piece with continuous retouch on one edge
24.94/28l	_	flint	deep patination	sub-parallel	direct	absent	49	13	4	2.7	84	truncated bladelet ("Cheddar point")
24.94/29a	Mousterian	flint	deep patination	scalar	direct	plain	26	22	10	6.3	77	side-scraper
24.94/29b	PseudoMousterian	flint	slight patination	sub-parallel	direct	plain	32	42	10	15.2	65	piece with continuous retouch on one edge
24.94/30a	_	flint	deep patination	none	_	absent	40	42	34	102.4	93	core
24.94/30b	Mousterian	flint	deep patination	abrupt	direct	plain	19	22	6	4.5	66	piece with continuous retouch on both edges

NATIONAL MUSEUMS AND GALLERIES OF WALES: LIST BY ACCESSION NUMBER.

ACC. NO.	PREV. CLASS.	MATERIAL	PATINATION	RETOUCH TYPE	R. POSITION	PLATFORM TYPE	L/mm	W/mm	Th/mm	W/g.	TYPE	CLASSIFICATION
24 94/32a*	–	rhyolite	none	none	–	absent	40	30	24	135.1	93	handaxe (Lower or Middle Palaeolithic)
24 94/32b	–	chert	none	none	–	point only	40	52	25	79.7	93	debitage
24 94/33a	PseudoMousterian	rhyolite	none	none	–	absent	40	30	24	39.3	106	core
24 94/33b	–	flint	deep patination	none	–	absent	43	20	10	13.1	93	debitage
24 94/34	burin flake	chert	none	scalar	direct	point only	40	30	24	19.2	106	core
24 94/35a	–	flint	deep patination	sub-parallel	direct	plain	31	3	4	0.6	93	debitage (burin spall)
24 94/35b*	Mousterian	flint	deep patination	abrupt	direct	absent	56	19	5	7	107	single burin
24 94/36	Mousterian	flint	deep patination	none	–	absent	25	24	25	22.5	106	core
24 94/37a	–	flint	deep patination	s-l s s	direct	absent	30	16	12	7.2	93	debitage
24 94/38	Mousterian	flint	deep patination	none	–	plain	33	34	20	23.2	106	core
24 94/39*	–	flint	deep patination	scalar	bifacial	plain	39	33	12	19.8	93	disc core
24 94/61	scraper	flint	deep patination	parallel	bifacial	absent	32	30	23	23.2	106	core
24 94/62	–	flint	deep patination	scalar	direct	absent	43	24	14	15.9	93	debitage
24 94/63	scraper	chert	none	parallel	direct	absent	44	22	22	25.5	106	core
24 94/64	core/ burin on core	flint	deep patination	sub-parallel	direct	plain	33	56	22	41.4	77	side-scraper
24 94/65	lateral burin	flint	deep patination	sub-parallel	bifacial	absent	46	27	25	42.3	32	busqué burin (atypical)
24 94/67	lateral burin	flint	deep patination	scalar	inverse	plain	44	12	4	3.7	27	dihedral straight burin
24 94/69	lateral burin	flint	deep patination	none	–	dihedral	34	32	10	13.7	28	offset dihedral burin
24 94/70	lateral burin	flint	deep patination	sub-parallel	inverse	absent	41	22	5	8.6	106	core
24 94/71	lateral burin	flint	deep patination	s-l s s	direct	plain	38	47	13	25.3	106	core
24 94/72	lateral burin	flint	deep patination	none	–	absent	24	25	7	5.1	27	dihedral straight burin
24 94/73	lateral burin	flint	deep patination	scalar	direct	absent	27	37	20	20.7	65	piece with continuous retouch on one side
24 94/74	lateral burin	flint	deep patination	s-l s s	direct	absent	32	22	10	8.9	30	burin on a break
24 94/75	lateral burin	flint	deep patination	scalar	direct	absent	31	14	10	5.2	65	piece with continuous retouch on one side
24 94/76	lateral burin	flint	deep patination	scalar	direct	plain	31	35	13	13.2	17	end-scraper - burin
24 94/77	lateral burin	flint	deep patination	scalar	direct	absent	31	19	5	3.7	27	dihedral straight burin
24 94/78	–	rhyolite	none	none	–	point only	37	20	7	5.6	93	debitage
24 94/79	–	flint	deep patination	none	–	plain	35	27	11	13.7	93	debitage
24 94/82	lateral burin	flint	deep patination	abrupt	direct	convex facetted	30	35	13	16.8	107	single burin
24 94/83	lateral burin	flint	deep patination	none	–	plain	25	17	10	3.9	107	single burin
24 94/84	lateral burin	flint	deep patination	sub-parallel	direct	plain	33	19	5	3.8	17	end-scraper - burin
24 94/85	lateral burin	flint	deep patination	none	–	absent	20	11	5	1.4	93	debitage (burin spall)
24 94/86	burin	flint	deep patination	none	–	absent	40	16	7	6.1	107	single burin
24 94/87	lateral burin	flint	deep patination	parallel	bifacial	absent	32	13	5	2.5	5	end-scraper on retouched blank
24 94/88	–	chert	none	scalar	direct	plain	36	18	7	6.2	107	single burin
24 94/89a	burin	flint	deep patination	scalar	inverse	plain	32	18	6	5.9	27	dihedral straight burin
24 94/89b	burin	chert	none	scalar	direct	absent	28	11	4	2.5	107	single burin
24 94/90	lateral burin	flint	deep patination	scalar	direct	absent	30	19	5	5	107	single burin
24 94/91	–	flint	deep patination	abrupt	direct	flat facetted	40	19	5	4.9	107	single burin (possibly very atypical busqué burin)
24 94/92	burin	flint	deep patination	none	–	absent	18	29	6	3.4	93	debitage
24 94/93	graver	chert	none	abrupt	direct	absent	23	18	4	2.6	36	burin on concave retouched truncation
24 94/94	burin	flint	deep patination	scalar	direct	absent	40	30	7	7.8	17	end-scraper - burin
24 94/95	angle burin	flint	slight patination	s-l s s	direct	absent	31	32	13	12.1	17	end-scraper - burin
24 94/96	angle burin	flint	deep patination	sub-parallel & s-l s s	direct	absent	35	31	18	18.9	17	end-scraper - burin
24 94/97	angle burin	flint	slight patination	scalar	inverse	convex facetted	39	14	5	4	29	dihedral angle burin
24 94/98	angle burin	flint	deep patination	scalar	inverse	absent	35	17	6	3.9	107	single burin
24 94/99a	lateral burin	flint	deep patination	scalar	direct	plain	34	16	6	4	29	dihedral angle burin
24 94/99b	lateral burin	flint	deep patination	scalar	direct	plain	38	28	16	17.7	2	atypical end-scraper
24 94/100	flake	rhyolite	none	s-l s s	direct	plain	57	45	6	40.7	93	debitage
24 94/101	–	chert	none	sub-parallel & s-l s s	direct	point only	21	36	10	11.4	34	burin on straight retouched truncation
24 94/102	graver	flint	slight patination	none	–	absent	32	20	7	4.2	27	dihedral straight burin
24 94/103	–	rhyolite	none	scalar	direct	absent	35	24	7	6.8	27	dihedral straight burin
24 94/104	burin	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

NATIONAL MUSEUMS AND GALLERIES OF WALES: LIST BY ACCESSION NUMBER.

ACC. NO.	PREV. CLASS.	MATERIAL	PATINATION	RETOUCH TYPE	R. POSITION	PLATFORM TYPE	L/mm	W/mm	Th/mm	W/g.	TYPE	CLASSIFICATION
24.94/106	graver	chert	none	none	_	absent	32	14	5	3.4	93	debitage
24.94/107	_	flint	slight patination	none	_	absent	26	16	5	2.9	93	debitage
24.94/110	_	flint	deep patination	scalar	inverse	absent	34	25	6	5.2	27	dihedral straight burin
24.94/111	burin d'angle anormal	flint	deep patination	scalar	direct	absent	31	23	8	9.6	107	single burin
24.94/112a	_	rhyolite	none	none	_	plain	19	21	4	2.4	29	dihedral angle burin
24.94/112b	burin d'angle anormal	flint	deep patination	sub-parallel	direct	plain	34	33	9	8.8	30	burin on a break
24.94/113	burin au bec de flute	flint	deep patination	none	_	absent	70	21	6	7.7	27	dihedral straight burin
24.94/115*	burin	flint	deep patination	none	_	absent	33	20	9	8.7	32	busqué burin (atypical)
24.94/116*	burin	flint	deep patination	none	_	absent	39	20	11	13.5	32	busqué burin (atypical)
24.94/117	_	chert	none	scalar	direct	plain	19	45	10	10.2	65	piece with continuous retouch on one edge
24.94/118	burin busqué	flint	deep patination	scalar	direct	absent	23	19	10	4	65	end-scraper - burin
24.94/119	burin busqué	flint	deep patination	none	_	flat facetted	34	26	8	8.1	32	busqué burin
24.94/120	burin g busqué	flint	deep patination	none	_	absent	26	20	18	7.7	29	dihedral angle burin
24.94/121	burin g busqué	chert	none	none	_	absent	45	18	10	10.2	107	single burin
24.94/122	burin g busqué	flint	deep patination	none	none	point only	51	16	5	4.8	107	single burin
24.94/123	burin g busqué	chert	none	none	_	point only	44	19	11	8.3	93	debitage
24.94/124	burin g busqué	flint	deep patination	scalar & sub-parallel	direct	absent	36	15	7	3.8	93	debitage
24.94/125	graver	flint	deep patination	scalar & sub-parallel	inverse	plain	21	42	10	9.5	28	offset dihedral burin
24.94/126	_	flint	deep patination	sub-parallel	inverse	absent	4	6	8	5.8	28	offset dihedral burin
24.94/127	scraper	flint	slight patination	sub-parallel	inverse	flat facetted	31	15	6	3.1	2	atypical end-scraper
24.94/128	burin	flint	deep patination	none	_	plain	11	12	20	2.8	93	debitage
24.94/129	burin busqués	flint	deep patination	scalar	direct	absent	49	23	12	22	31	multiple dihedral burin
24.94/130	_	flint	deep patination	sub-parallel	direct	absent	25	13	10	3.8	93	debitage
24.94/131	_	rhyolite	none	none	_	absent	41	20	13	11.7	27	dihedral straight burin
24.94/133	burin d'angle	flint	deep patination	none	_	plain	23	44	14	17.9	107	single burin
24.94/134	burin d'angle	flint	deep patination	none	_	point only	44	28	14	15.6	28	offset dihedral burin
24.94/135	burin d'angle	flint	deep patination	sub-parallel	inverse	dihedral	34	22	12	8.5	35	burin on oblique retouched truncation
24.94/136	burin d'angle	flint	deep patination	sub-parallel	inverse	flat facetted	34	22	8	8.5	34	burin on straight retouched truncation
24.94/137	_	flint	deep patination	scalar	direct	flat facetted	25	11	6	6.7	107	single burin
24.94/138	museau à retouches inverses	flint	deep patination	sub-parallel	inverse	dihedral	32	27	8	6.5	65	piece with continuous retouch on one edge
24.94/139	_	chert	none	sub-parallel	inverse	flat facetted	49	26	8	1.8	14	flat nosed end-scraper
24.94/140	_	chert	none	scalar & sub-parallel	inverse	plain	37	26	6	5.9	14	flat nosed end-scraper
24.94/141	_	rhyolite	none	scalar	inverse	plain	40	19	9	9.7	5	end-scraper on retouched blank
24.94/142	_	chert	none	sub-parallel	direct	flat facetted	31	32	18	17	65	piece with continuous retouch on one edge
24.94/143	_	chert	none	sub-parallel	inverse	absent	26	27	8	6.4	93	debitage
24.94/144	museau à retouches inverses	rhyolite	none	sub-parallel	inverse	plain	60	20	10	16.6	61	oblique truncation (atypical)
24.94/145*	_	flint	deep patination	sub-parallel	inverse	plain	40	25	8	7.8	14	flat nosed end-scraper
24.94/146*	museau à retouches inverses	flint	deep patination	sub-parallel	inverse	flat facetted	34	24	17	6.7	14	flat nosed end-scraper
24.94/147a	_	flint	deep patination	sub-parallel	direct	flat facetted	29	18	10	6.4	65	piece with continuous retouch on one edge (atypical)
24.94/147b	_	flint	deep patination	sub-parallel	inverse	absent	34	17	6	3	17	end-scraper - burin
24.94/147c	"last trench"	flint	deep patination	sub-parallel	bifacial	point only	42	32	14	13.1	65	piece with continuous retouch on one edge
24.94/147d	burin	flint	deep patination	scalar	direct	plain	31	23	6	7.7	27	dihedral straight burin
24.94/149	flake	flint	deep patination	sub-parallel	direct	absent	44	30	5	6.7	2	atypical end-scraper
24.94/150	grattoir	flint	deep patination	sub-parallel	direct	dihedral	29	23	8	7.6	5	end-scraper on retouched blank
24.94/151a	_	flint	deep patination	scalar	direct	absent	28	19	6	2.3	65	piece with continuous retouch on one edge
24.94/151b	_	flint	deep patination	scalar	direct	point only	42	23	6	15.5	93	debitage
24.94/152	_	flint	deep patination	scalar	direct	absent	26	21	4	3.5	60	straight truncation
24.94/153	grattoir simple	chert	none	abrupt	bifacial	absent	32	22	7	8.4	5	end-scraper on retouched blank
24.94/154	grattoir	flint	deep patination	abrupt	bifacial	absent	29	33	6	9.5	65	piece with continuous retouch on one edge
24.94/155	grattoir simple	flint	deep patination	scalar	direct	absent	35	22	13	12.4	1	single end-scraper (on core trimming flake)
24.94/156	grattoir	flint	deep patination	sub-parallel	direct	absent	29	20	4	3.2	8	flake end-scraper
24.94/157	grattoir	flint	deep patination	scalar	direct	flat facetted	25	23	9	4.1	8	flake end-scraper (broken)
24.94/158	grattoir simple	chert	none	sub-parallel	direct	flat facetted	25	25	9	5.2	2	atypical end-scraper

APPENDIX II: Catalogue of Finds.

NATIONAL MUSEUMS AND GALLERIES OF WALES: LIST BY ACCESSION NUMBER.

ACC. NO.	PREV. CLASS.	MATERIAL	PATINATION	RETOUCH TYPE	R. POSITION	PLATFORM TYPE	L/mm	W/mm	Th/mm	W/g.	TYPE	CLASSIFICATION
24.94/160	grattoir	flint	deep patination	sub-parallel	direct	absent	36	16	8	4.4	2	atypical end-scraper
24.94/161	_	flint	deep patination	scalar	direct	absent	42	14	8	5.2	65	piece with continuous retouch on one edge
24.94/162	scraper	flint	deep patination	scalar	direct	absent	21	22	11	5.7	10	thumb-nail end-scraper
24.94/163	grattoir	flint	deep patination	scalar	direct	absent	20	24	6	4.6	2	atypical end-scraper
24.94/164a	end scraper	flint	slight patination	sub-parallel	direct	absent	42	25	13	13.6	65	piece with continuous retouch on one edge
24.94/164b	grattoir au bout de lame	flint	deep patination	scalar	direct	plain	50	24	11	17.9	2	atypical end-scraper
24.94/164c	scraper	flint	deep patination	scalar	direct	convex facetted	21	22	5	3.8	93	debitage
24.94/165	mâir subligne	flint	slight patination	abrupt	direct	plain	22	21	10	9.8	62	concave truncation
24.94/166	mâir rectiligne	flint	deep patination	abrupt	direct	plain	27	20	6	4	93	debitage
24.94/167	_	rhyolite	none	none	direct	plain	29	43	7	29	66	piece with continuous retouch on both edges
24.94/168	_	flint	deep patination	none	direct	plain	8	12	5	1.5	13	thick nosed end-scraper
24.94/169	grattoir rectiligne	flint	deep patination	abrupt	direct	plain	31	23	8	5.4	8	flake end-scraper
24.94/170	grattoir rectiligne	flint	deep patination	abrupt	direct	absent	17	26	7	3	8	flake end-scraper
24.94/171	grattoir rectiligne	flint	deep patination	scalar	direct	absent	24	28	7	5.9	65	piece with continuous retouch on one edge
24.94/172	_	chert	none	none	_	absent	35	47	12	33.9	93	debitage
24.94/173	_	chert	none	none	_	plain	16	18	10	4.1	93	debitage
24.94/174	_	chert	none	sub-parallel	direct	plain	36	25	13	15.1	93	debitage
24.94/175	_	rhyolite	none	none	_	absent	14	13	10	4.1	93	debitage
24.94/176	_	chert	none	sub-parallel	direct	flat facetted	22	28	12	7.4	93	debitage
24.94/177	_	chert	none	none	_	absent	21	22	7	4.6	93	debitage
24.94/178	_	rhyolite	none	none	_	dihedral	32	22	8	7.7	93	debitage
24.94/179	_	rhyolite	none	sub-parallel	inverse	absent	26	40	12	7.8	93	debitage
24.94/180*	_	chert	none	none	_	plain	29	28	11	15.4	60	straight truncation
24.94/182	_	flint	deep patination	scalar	direct	plain	50	30	9	10.9	93	debitage
24.94/183a	graver	chert	deep patination	sub-parallel	direct	dihedral	42	25	8	17.2	93	debitage
24.94/183b	_	chert	none	abrupt	direct	absent	20	18	7	4	60	straight truncation
24.94/184	_	flint	deep patination	scalar	direct	absent	25	23	8	6.1	60	straight truncation
24.94/185	_	flint	slight patination	scalar	direct	absent	28	19	10	5.6	61	oblique truncation
24.94/186	_	flint	deep patination	abrupt	direct	flat facetted	34	19	7	5.7	2	atypical end-scraper
24.94/187	_	rhyolite	slight patination	scalar	inverse	flat facetted	70	28	14	32.8	34	burin on straight retouched truncation
24.94/188	_	flint	deep patination	abrupt	inverse	absent	22	17	7	3.5	2	atypical end-scraper
24.94/189b	_	flint	none	scalar	direct	plain	43	23	8	8	60	straight truncation
24.94/190	_	flint	deep patination	scalar	direct	absent	12	48	5	5.1	27	dihedral straight burin
24.94/192	_	flint	deep patination	none	_	absent	29	28	11	9.8	93	debitage
24.94/193a	_	flint	deep patination	abrupt	direct	plain	44	34	7	14.1	65	piece with continuous retouch on one edge
24.94/193b	_	flint	none	sub-parallel	direct	flat facetted	35	9	11	7.5	14	shouldered end-scraper
24.94/194	_	flint	deep patination	abrupt	direct	plain	34	18	6	4.1	23	piercer
24.94/195	blade	chert	none	abrupt	direct	absent	10	24	4	1.2	93	debitage
24.94/196	_	flint	deep patination	none	_	dihedral	20	13	4	1.9	93	debitage
24.94/197	_	chert	none	none	_	plain	11	26	8	2.5	61	oblique truncation
24.94/198	flake	flint	deep patination	none	_	plain	12	18	6	1.2	93	debitage
24.94/199*	_	flint	none	s-l-s-s	_	absent	25	35	9	7.9	61	oblique truncation
24.94/200	grattoir rectiligne	flint	deep patination	abrupt	direct	absent	38	31	10	14.4	60	straight truncation
24.94/201	grattoir rectiligne	flint	deep patination	abrupt	direct	absent	33	30	7	9.4	62	concave truncation
24.94/202	grattoir rectilinear	flint	deep patination	abrupt	inverse	plain	37	24	8	9.2	62	concave truncation
24.94/203	grattoirs rectilignes avec concaves	flint	deep patination	scalar & abrupt	direct	flat facetted	35	43	8	11.9	93	debitage
24.94/205	_	chert	none	none	_	plain	36	24	8	11.3	93	debitage
24.94/206*	grattoirs rectilignes avec concaves	flint	deep patination	abrupt	direct	plain	40	27	8	10.7	61	oblique truncation
24.94/207*	grattoirs rectilignes avec concaves	flint	deep patination	scalar	direct	flat facetted	38	28	8	7.6	61	oblique truncation
24.94/208	_	chert	none	scalar	bifacial	absent	20	34	7	5.6	93	debitage
24.94/209	_	flint	deep patination	none	_	plain	31	36	10	8.4	93	debitage
24.94/210	grattoir court	flint	burnt	scalar & sub-parallel	direct	absent	29	29	10	12.3	1	single end-scraper
24.94/211	grattoir court	flint	deep patination	scalar	direct	absent	23	28	12	9.1	8	flake end-scraper

APPENDIX II: Catalogue of Finds.

NATIONAL MUSEUMS AND GALLERIES OF WALES: LIST BY ACCESSION NUMBER.

ACC. NO.	PREV. CLASS.	MATERIAL	PATINATION	RETOUCH TYPE	R. POSITION	PLATFORM TYPE	L/mm	W/mm	Th/mm	W/g	TYPE	CLASSIFICATION
24.94/213	_	flint	deep patination	scalar	direct	plain	27	19	10	4.6	8	flake end-scraper
24.94/214	_	flint	deep patination	abrupt	direct	dihedral	21	19	7	6.6	8	flake end-scraper
24.94/215	grattoir court	flint	deep patination	scalar	direct	absent	29	28	18	7.2	8	flake end-scraper
24.94/216	grattoir rectiligne	flint	deep patination	abrupt	inverse	absent	26	25	5	3.3	8	flake end-scraper
24.94/217	grattoir	flint	deep patination	abrupt	inverse	plain	30	23	7	4.3	60	straight truncation
24.94/218	_	chert	none	sub-parallel	inverse	point only	24	35	6	6.4	14	flat nosed end-scraper
24.94/220	_	flint	deep patination	scalar	direct	plain	43	34	20	29	8	flake end-scraper (alypical)
24.94/221	grattoir rectiligne	flint	deep patination	scalar	direct	dihedral	40	37	17	24.4	14	flat nosed end-scraper
24.94/222	grattoir court	flint	deep patination	scalar	direct	plain	35	34	6	17	8	flake end-scraper (alypical)
24.94/223	_	chert	none	scalar	direct	absent	36	35	10	12.6	8	flake end-scraper
24.94/224	_	chert	none	sub-parallel	inverse	plain	40	41	17	29.2	93	debitage
24.94/225	_	chert	none	none	_	dihedral	28	24	8	6.7	8	flake end-scraper
24.94/226	scraper	flint	deep patination	abrupt	direct	plain	31	24	7	7.4	8	flake end-scraper
24.94/227	_	rhyolite	none	sub-parallel	direct	dihedral	31	19	8	8	4	oglval end-scraper
24.94/228	_	chert	none	scalar	direct	plain	22	19	9	7	4	oglval end-scraper
24.94/230	scraper	chert	none	scalar	direct	flat facetted	27	18	7	5.9	4	oglval end-scraper (alypical)
24.94/231	_	chert	none	scalar	bifacial	dihedral	25	15	7	3.7	4	oglval end-scraper (alypical)
24.94/232	_	rhyolite	none	scalar	bifacial	plain	23	21	10	7	93	debitage
24.94/233	_	rhyolite	none	scalar & sub-parallel	direct	dihedral	20	21	9	6.1	10	thumbnail scraper
24.94/234	_	rhyolite	none	none	_	absent	20	28	10	10.3	93	debitage
24.94/235	_	chert	none	scalar	bifacial	plain	22	16	6	3.7	93	debitage
24.94/236	_	chert	none	scalar	direct	absent	33	23	15	18.1	93	debitage
24.94/237	_	chert	none	scalar	direct	flat facetted	28	25	14	11.2	65	piece with continuous retouch on one side
24.94/238	_	chert	none	scalar	direct	absent	29	23	13	9.4	65	piece with continuous retouch on one side
24.94/240	_	chert	none	none	_	plain	31	22	11	9.1	93	debitage
24.94/241	_	chert	none	none	_	plain	30	25	8	8.6	93	debitage
24.94/242	_	chert	none	abrupt	inverse	plain	27	28	13	12.7	93	debitage
24.94/243	_	chert	none	scalar	direct	plain	23	22	9	7.4	8	flake end-scraper (alypical)
24.94/244	_	chert	none	scalar	direct	plain	27	26	13	12.5	8	flake end-scraper (alypical)
24.94/245	_	chert	none	scalar	inverse	dihedral	26	25	13	10.6	8	flake end-scraper
24.94/246a	_	flint	deep patination	sub-parallel	direct	absent	25	21	7	7.1	17	end-scraper - burin
24.94/246b	_	flint	deep patination	scalar	direct	plain	25	19	7	4.8	93	debitage
24.94/248	_	chert	none	none	_	plain	24	20	10	7	93	debitage
24.94/249a	_	chert	none	none	_	plain	23	21	8	6.5	93	debitage
24.94/249b	_	chert	none	none	_	plain	24	13	9	6	93	debitage
24.94/250	_	rhyolite	none	none	_	plain	24	27	7	3.8	93	debitage
24.94/252	bec et courbe sur bout de lame	rhyolite	none	scalar	inverse	absent	28	31	11	11.4	93	debitage (partially retouched piece)
24.94/253	_	rhyolite	none	sub-parallel	inverse	absent	40	47	12	18.4	93	debitage
24.94/254	_	rhyolite	none	scalar	bifacial	absent	30	18	18	30.3	8	flake end-scraper (alypical)
24.94/255a	_	flint	deep patination	abrupt	direct	absent	24	22	4	0.7	2	alypical end-scraper (microlithic)
24.94/255b*	_	chert	none	abrupt	direct	absent	30	26	12	10.5	63	concave truncation
24.94/256	_	other	none	scalar	direct	dihedral	34	27	10	9.4	93	debitage
24.94/257	_	rhyolite	none	abrupt	direct	absent	24	27	8	6.2	60	straight truncation
24.94/258	grattoir	flint	deep patination	scalar	direct	absent	43	32	13	19.3	93	debitage
24.94/259	_	chert	none	sub-parallel	direct	plain	23	17	14	13.4	93	debitage
24.94/260	grattoir rectiligne	chert	none	abrupt	inverse	dihedral	34	37	14	6.2	14	shouldered end-scraper
24.94/261	_	rhyolite	none	abrupt	direct	absent	34	45	14	30.3	65	piece with continuous retouch on one side
24.94/262	_	rhyolite	none	sub-parallel	direct	absent	32	47	13	23.4	14	shouldered end-scraper
24.94/263	_	chert	none	abrupt	direct	plain	36	54	20	32.4	65	piece with continuous retouch on one side
24.94/264	_	flint	deep patination	scalar & sub-parallel	direct	absent	32	28	12	10.5	14	flat nosed end-scraper
24.94/265	grattoir museau oglval	rhyolite	none	scalar	direct	absent	29	24	11	12.7	14	flat nosed end-scraper
24.94/266	_	flint	deep patination	sub-parallel	direct	absent	29	18	11	6.7	14	shouldered end-scraper
											93	debitage

APPENDIX II: Catalogue of Finds.

NATIONAL MUSEUMS AND GALLERIES OF WALES: LIST BY ACCESSION NUMBER.

ACC. NO.	PREV. CLASS.	MATERIAL	PATINATION	RETOUCH TYPE	R. POSITION	PLATFORM TYPE	L/mm	W/mm	Th/mm	W/g	TYPE	CLASSIFICATION
24.94/269	_	flint	deep patination	sub-parallel	direct	absent	39	18	7	4.1	93	debitage
24.94/270	_	flint	deep patination	sub-parallel	direct	absent	54	21	9	9	14	flat nosed end-scraper
24.94/271	_	rhyolite	none	scalar	direct	point only	44	42	12	19.5	93	debitage
24.94/272	_	flint	deep patination	s-l s s	direct	point only	41	16	10	7.1	93	debitage
24.94/273	_	chert	none	none	_	flat facetted	39	38	11	16.6	93	debitage
24.94/274	_	chert	none	none	_	plain	32	19	7	7.5	93	debitage
24.94/275	_	chert	none	subparallel	inverse	point only	28	14	11	9.5	61	oblique truncation
24.94/276	_	chert	none	none	_	absent	36	18	6	4.4	93	debitage
24.94/277	_	chert	none	none	_	plain	61	19	13	14	93	debitage
24.94/278	bec et courbe sur bout de lame	chert	none	none	_	plain	28	30	10	13.3	93	debitage
24.94/279	_	flint	deep patination	subparallel	inverse	absent	38	18	8	5.3	61	oblique truncation
24.94/280	_	rhyolite	none	s-l s s	inverse	absent	40	21	10	9.1	93	debitage
24.94/281	scraper	chert	none	s-l s s	direct	plain	27	31	9	11	61	oblique truncation
24.94/282	scraper	chert	none	s-l s s	direct	plain	31	29	14	12.6	93	debitage
24.94/283*	_	flint	deep patination	scalar	direct	absent	29	23	8	6	63	concave truncation
24.94/285	_	rhyolite	none	scalar	direct	absent	20	19	10	7.6	93	debitage
24.94/286	scraper	rhyolite	none	stepped scalar	inverse	absent	59	15	6	4.5	63	concave truncation
24.94/287	scraper	flint	none	sub-parallel	inverse	absent	58	15	6	4.5	64	convex truncation
24.94/288	_	flint	deep patination	sub-parallel	inverse	absent	45	13	7	4.6	92	blade pointed by retouch
24.94/289	_	flint	deep patination	abrupt	inverse	absent	32	10	4	1.6	85	backed bladelet (retouched cortical edge)
24.94/290	_	flint	burnt	abrupt	inverse	absent	22	11	5	2	85	backed bladelet
24.94/291	_	flint	slight patination	none	_	absent	32	10	4	1.9	85	backed bladelet
24.94/292	_	flint	deep patination	abrupt	inverse	plain	30	13	3	1.3	65	piece with continuous retouch on one side
24.94/293	_	flint	deep patination	none	_	point only	37	12	5	1.7	93	debitage (unretouched bladelet)
24.94/295	_	flint	deep patination	abrupt	inverse	absent	20	13	6	1.4	85	backed bladelet (fragment)
24.94/297	perçoir	flint	deep patination	scalar	direct	dihedral	26	39	12	9.8	8	flake end-scraper
24.94/298	perçoir	flint	deep patination	denticulate	inverse	absent	25	13	8	4	93	debitage
24.94/299	perçoir	flint	deep patination	scalar	direct	absent	27	12	6	2.4	93	debitage
24.94/300	perçoir	flint	deep patination	scalar	bifacial	plain	30	28	5	5.4	66	piece with continuous retouch on both edges
24.94/301	perçoir	flint	deep patination	scalar	direct	flat facetted	26	23	6	3.1	66	piece with continuous retouch on both edges
24.94/302	borer	flint	burnt	scalar	direct	plain	32	30	10	8.2	93	debitage
24.94/303	perçoir	flint	deep patination	abrupt	direct	absent	23	43	10	14.4	93	debitage (core trimming flake)
24.94/305	_	chert	deep patination	abrupt	inverse	plain	32	36	9	17.5	23	piercer
24.94/306	_	flint	deep patination	scalar & sub-parallel	direct	plain	53	39	13	27.6	65	piece with continuous retouch on one edge
24.94/307	_	flint	deep patination	s-l s s	direct	absent	12	27	7	2.8	93	debitage
24.94/308	_	flint	deep patination	s-l s s	direct	plain	25	25	8	4.9	93	debitage
24.94/309	perçoir	flint	deep patination	scalar	direct	plain	31	26	8	7.3	23	notched piece
24.94/310	_	flint	deep patination	sub-parallel	direct	plain	52	26	12	18.6	93	debitage
24.94/311	_	flint	slight patination	scalar	direct	absent	26	20	6	3.7	93	debitage
24.94/312	_	chert	none	scalar	bifacial	absent	16	17	7	2.4	69	leaf point (broken)
24.94/313	_	chert	none	scalar	_	plain	24	18	6	5	66	piece with continuous retouch on both edges (possibly leaf point)
24.94/314a	_	rhyolite	none	scalar	inverse	absent	36	18	8	5.9	69	leaf point (broken)
24.94/314b	_	chert	none	none	_	flat facetted	51	22	5	7.2	93	debitage
24.94/315	_	rhyolite	none	scalar	bifacial	absent	22	23	9	4.7	69	leaf point (broken)
24.94/318	_	other	none	none	_	plain	67	14	6	5.8	93	debitage
24.94/320	blade	rhyolite	none	abrupt	direct	absent	53	16	7	6.2	92	blade pointed by retouch
24.94/321	unworked blade	chert	none	scalar	direct	absent	49	18	5	5.1	65	piece with continuous retouch on one edge
24.94/323	_	chert	none	none	_	plain	43	20	5	6.1	93	debitage
24.94/324	_	flint	none	none	_	convex facetted	44	11	5	3.8	93	debitage (unretouched blade)
24.94/325	_	flint	none	none	_	plain	46	23	6	6.4	93	debitage
24.94/326	_	flint	deep patination	scalar	direct	absent	50	16	8	7.3	65	piece with continuous retouch on one edge
24.94/327	_	flint	deep patination	none	_	plain	41	15	3	2.5	93	debitage (unretouched blade)

NATIONAL MUSEUMS AND GALLERIES OF WALES: LIST BY ACCESSION NUMBER.

ACC. NO.	PREV. CLASS.	MATERIAL	PATINATION	RETOUCH TYPE	R. POSITION	PLATFORM TYPE	L/mm	W/mm	Th/mm	W/g.	TYPE	CLASSIFICATION
24.94/330	_	flint	deep patination	scalar	direct	plain	48	17	5	4.4	65	piece with continuous retouch on one edge
24.94/331	_	flint	deep patination	none	_	plain	45	18	6	5.9	93	debitage
24.94/332a	_	chert	none	none	_	point only	46	13	5	3.6	93	debitage
24.94/332b	_	chert	none	none	_	absent	33	13	4	2.4	93	debitage
24.94/334	_	chert	deep patination	none	_	convex facetted	37	15	5	3.2	93	debitage
24.94/336	_	flint	deep patination	none	_	point only	34	17	4	2	93	debitage
24.94/337	_	flint	deep patination	abrupt	direct	absent	approx 38	15	3	2.1	93	debitage (broken and glued)
24.94/338	_	flint	deep patination	none	_	plain	40	16	5	3.8	93	debitage
24.94/339	_	flint	deep patination	none	_	plain	29	14	6	2.3	93	debitage
24.94/340a	_	flint	deep patination	abrupt	inverse	absent	23	19	2	1.3	93	debitage
24.94/340b	_	flint	deep patination	none	_	plain	36	19	3	3	93	debitage
24.94/341	_	chert	none	none	_	absent	45	21	8	8.1	93	debitage
24.94/342	_	rhyolite	none	none	_	point only	45	48	6	7	93	debitage
24.94/343	_	rhyolite	none	none	_	plain	43	45	15	41.8	93	debitage
24.94/344	_	chert	none	none	_	absent	20	27	7	1.8	93	debitage
24.94/345	_	flint	deep patination	abrupt	direct	plain	55	25	11	2	65	piece with continuous retouch on one edge
24.94/346*	_	flint	deep patination	scalar	direct	plain	44	35	8	3.3	67	Aurignacian blade
24.94/347	_	flint	deep patination	scalar	direct	plain	59	26	14	2.5	65	piece with continuous retouch on one edge
24.94/348	_	flint	deep patination	none	_	absent	52	27	12	1.2	93	debitage
24.94/349*	_	flint	deep patination	scalar	direct	absent	30	21	9	2.8	69	leaf point (fragment)
24.94/350	_	flint	deep patination	scalar	direct	plain	26	34	9	7.9	93	debitage
24.94/351*	_	flint	deep patination	scalar	inverse	absent	35	28	35	6.8	93	blade core
24.94/352	_	flint	deep patination	none	_	absent	53	9	15	41.8	106	core
24.94/353a	_	flint	slight patination	scalar	direct	absent	30	9	5	8.4	93	debitage (core trimming flake)
24.94/353b	_	flint	deep patination	none	_	absent	44	13	13	6	106	core
24.94/354	_	flint	deep patination	none	_	absent	33	20	10	7.2	106	core
24.94/355_1	core	chert	none	none	_	absent	24	27	15	13.4	106	core
24.94/355_2	flake core	rhyolite	none	none	_	absent	30	45	22	35.4	106	core
24.94/355_3	_	chert	none	none	_	absent	29	24	16	17.7	106	core
24.94/355_4	scraper	chert	none	none	_	absent	31	26	14	11.2	93	debitage
24.94/355_5	blade	chert	none	none	_	absent	30	11	4	1.7	93	debitage
24.94/355_6	_	chert	none	none	_	point only	30	13	7	5.6	93	debitage
24.94/355_7	_	chert	none	none	_	absent	28	24	15	9.7	93	debitage
24.94/355_8	_	chert	none	none	_	plain	60	30	11	32.5	93	debitage
24.94/355_9	blade	chert	none	sub-parallel	direct	absent	27	8	5	1.6	93	debitage (core trimming flake)
24.94/355_10	_	chert	none	none	_	point only	37	29	11	15.4	93	debitage
24.94/355_11	_	rhyolite	none	none	_	point only	28	11	2	1.2	93	debitage
24.94/355_12	_	rhyolite	none	none	_	plain	41	28	7	7.7	93	debitage
24.94/355_13	burin	rhyolite	none	none	_	plain	28	9	3	1.8	93	debitage
24.94/355_14	_	chert	none	none	_	point only	54	18	15	24	93	debitage
24.94/355_15	_	rhyolite	none	none	_	plain	44	40	14	35.4	93	debitage
24.94/355_16	flake	rhyolite	none	abrupt	direct	absent	76	25	15	42.3	93	debitage
24.94/355_17	_	rhyolite	none	none	_	point only	24	22	11	9	93	debitage
24.94/355_18	flake	rhyolite	none	none	_	point only	40	25	13	15.1	93	debitage
24.94/355_19	_	rhyolite	none	none	_	absent	52	34	17	40.9	28	offset dihedral burin
24.94/355_20	_	chert	none	none	_	absent	31	15	7	6.8	93	debitage
24.94/355_21	_	chert	none	none	_	dihedral	52	36	13	30	93	debitage
24.94/355_22	_	chert	none	none	_	plain	21	34	5	4.4	93	debitage
24.94/355_23	_	rhyolite	none	none	_	plain	44	21	8	6.4	93	debitage
24.94/355_24	_	chert	none	none	_	absent	39	23	17	18.3	93	debitage
24.94/355_25	_	rhyolite	none	none	_	absent	30	12	9	6.2	93	debitage
24.94/355_26	scraper	rhyolite	none	none	_	absent	1	20	37	9.7	93	flake end-scraper
24.94/355_27	_	rhyolite	none	none	_	plain	30	20	10	7.8	93	debitage

NATIONAL MUSEUMS AND GALLERIES OF WALES: LIST BY ACCESSION NUMBER.

ACC. NO.	PREV. CLASS.	MATERIAL	PATINATION	RETOUCH TYPE	R. POSITION	PLATFORM TYPE	L/mm	W/mm	Th/mm	W/g	TYPE	CLASSIFICATION
24.94/355.29	_	rhyolite	none	_	_	plain	27	63	17	31	93	debitage
24.94/355.30	_	chert	none	scalar	direct	plain	11	16	4	0.8	93	debitage
24.94/355.31	_	chert	none	none	_	plain	37	21	6	7.2	93	debitage
24.94/355.32	core	chert	none	none	_	point only	22	20	17	10.8	106	core
24.94/355.33	_	chert	none	none	_	absent	42	22	13	17.2	93	debitage
24.94/355.34	_	chert	none	none	_	point only	20	14	8	2.8	93	debitage
24.94/355.35	_	chert	none	none	_	point only	38	34	12	24.1	93	debitage
24.94/355.36	_	rhyolite	none	none	_	absent	27	34	12	13.6	93	debitage
24.94/355.37	_	chert	none	none	_	plain	33	19	11	11.3	93	debitage
24.94/355.38	_	chert	none	none	_	point only	26	12	10	5.2	93	debitage
24.94/355.39	_	chert	none	none	_	plain	34	53	11	24.5	93	debitage
24.94/355.40	_	chert	none	none	_	point only	28	13	7	3.1	93	debitage
24.94/355.41	_	chert	slight patination	none	_	point only	30	24	13	13.1	93	debitage
24.94/355.41a	_	chert	slight patination	none	_	point only	26	6	4	5	93	debitage
24.94/355.41b	_	chert	none	none	_	plain	29	22	14	10.1	93	debitage
24.94/355.42	_	chert	none	none	_	absent	28	20	8	6.2	93	debitage
24.94/355.43	_	chert	none	none	_	absent	35	11	4	3.7	93	debitage
24.94/355.44	_	chert	none	none	_	point only	30	18	11	8.7	93	debitage
24.94/355.45	_	rhyolite	none	none	_	point only	20	24	9	7.9	93	debitage
24.94/355.46	_	chert	none	none	_	absent	28	14	8	4.5	93	debitage
24.94/355.47	_	chert	none	none	_	plain	23	16	5	1.7	93	debitage
24.94/355.48	_	rhyolite	none	none	_	convex facetted	27	24	11	10.2	93	debitage
24.94/355.49	_	chert	none	none	_	plain	15	18	6	2.6	93	debitage
24.94/355.50	_	chert	none	none	_	point only	20	16	10	6.7	93	debitage
24.94/355.51	_	chert	none	none	_	absent	19	10	2	0.8	93	debitage
24.94/355.52	_	chert	none	none	_	point only	14	12	7	2.1	93	debitage
24.94/355.53	_	chert	none	none	_	point only	27	11	10	3.9	93	debitage
24.94/355.54	_	rhyolite	none	none	_	absent	12	20	2	1.6	93	debitage
24.94/355.55	_	chert	none	abrupt	inverse	absent	35	24	10	11.2	65	piece with continuous retouch on one edge
24.94/355.56	_	chert	none	none	_	absent	20	15	5	2.2	93	debitage
24.94/355.57	_	rhyolite	none	scalar	inverse	absent	19	11	6	1.9	93	debitage
24.94/355.58	_	chert	none	none	_	point only	17	8	4	1.1	93	debitage
24.94/355.59	_	chert	none	abrupt	inverse	absent	20	10	6	3.5	93	debitage
24.94/355.60	_	chert	none	none	_	absent	11	13	5	4.1	93	debitage
24.94/355.61	_	chert	none	none	_	absent	26	13	12	4.6	93	debitage
24.94/355.62	_	chert	none	none	_	absent	27	18	10	7.7	93	debitage
24.94/355.63	_	chert	none	none	_	absent	26	16	5	3.9	93	debitage
24.94/355.64	_	chert	none	abrupt	inverse	absent	15	14	9	1.8	93	debitage (possibly piercer)
24.94/355.65a	_	chert	none	none	_	point only	23	11	10	3.9	93	debitage
24.94/355.65b	stalagmite	other	none	none	_	absent	32	32	23	28.8	93	debitage (stal.)
24.94/355.66	_	chert	none	none	_	point only	22	17	8	4.3	93	debitage
24.94/355.67	_	chert	none	none	_	point only	22	15	10	4.6	93	debitage
24.94/355.68	_	chert	none	none	_	absent	25	9	2	1.1	93	debitage (unretouched bladelet)
24.94/355.69	core	chert	none	none	_	point only	35	32	11	18	93	debitage
24.94/355.70	_	chert	none	scalar	inverse	absent	24	9	5	1.4	93	debitage
24.94/355.71	_	chert	none	none	_	absent	40	35	15	25.2	93	debitage
24.94/355.72	_	chert	none	none	_	point only	19	33	8	4.9	93	debitage
24.94/355.73	core	rhyolite	none	none	_	absent	22	19	8	5.9	93	debitage
24.94/355.74	_	chert	none	none	_	point only	25	21	15	10.9	93	debitage
24.94/355.75	_	chert	none	none	_	plain	39	22	18	19	93	debitage
24.94/355.76	_	chert	none	none	_	plain	34	23	12	13.1	93	debitage
24.94/355.77	_	chert	none	none	_	plain	37	33	10	15.5	93	debitage
24.94/355.78	_	chert	none	none	_	plain	16	15	5	2.1	93	debitage
24.94/355.79	core	chert	none	none	_	plain	20	27	13	11.2	93	debitage

NATIONAL MUSEUMS AND GALLERIES OF WALES: LIST BY ACCESSION NUMBER.

ACC. NO.	PREV. CLASS.	MATERIAL	PATINATION	RETOUCH TYPE	R. POSITION	PLATFORM TYPE	L/mm	W/mm	Th/mm	W/g	TYPE	CLASSIFICATION
24.94/355.80	-	chert	none	none	-	point only	32	23	13	11.9	93	debitage
24.94/355.81	-	chert	none	none	-	point only	14	28	14	7.3	93	debitage
24.94/355.82	-	chert	none	none	-	point only	18	22	10	7.4	93	debitage
24.94/355.83	-	chert	none	s-l-s-s	direct	point only	15	26	11	6.2	93	debitage
24.94/355.84	-	chert	none	none	-	absent	16	20	8	4.7	93	debitage
24.94/355.85	-	chert	none	none	-	absent	10	27	8	3.7	93	debitage
24.94/355.86	-	chert	none	abrupt	inverse	absent	10	19	6	2.2	93	debitage
24.94/355.87	-	chert	none	none	-	point only	39	26	13	24.5	93	debitage
24.94/355.88	-	chert	none	sub-parallel	inverse	point only	25	31	16	15.4	93	debitage
24.94/355.89	-	chert	none	none	-	point only	27	21	15	9.5	93	debitage
24.94/355.90	scraper	chert	none	sub-parallel	inverse	absent	33	18	12	9.7	93	debitage
24.94/355.91	-	chert	none	none	-	absent	19	14	10	3.3	93	debitage
24.94/355.92	-	chert	none	none	-	plain	7	13	9	11.3	93	debitage
24.94/355.93	-	chert	none	scalar	direct	absent	24	13	8	3.7	93	debitage (possibly piercer)
24.94/355.94	flake	chert	none	sub-parallel	direct	absent	39	23	11	13.6	93	debitage
24.94/355.95	utilised blade fragment	chert	none	none	-	plain	25	10	2	1.3	93	debitage (bladelet)
24.94/355.96	-	chert	none	none	-	plain	48	25	10	17.1	93	debitage
24.94/355.97	-	chert	none	none	-	plain	28	27	13	13.9	93	debitage
24.94/355.98	-	chert	none	none	-	absent	35	23	12	10.4	93	debitage
24.94/355.99	-	chert	none	none	-	dihedral	32	39	8	10	93	debitage
24.94/355.100	-	chert	slight patination	none	-	plain	33	24	13	13.5	93	debitage
24.94/355.101	-	chert	none	scalar	-	dihedral	23	28	10	8.9	93	debitage
24.94/355.102	-	chert	none	none	-	absent	30	21	10	8.3	93	debitage
24.94/355.103	-	chert	none	none	-	absent	37	37	12	18.4	93	debitage
24.94/355.104	-	chert	none	scalar	direct	plain	34	13	3	3	93	debitage (core trimming flake)
24.94/355.105	-	chert	none	none	-	absent	18	25	12	6.8	93	debitage
24.94/355.106	-	chert	none	none	-	absent	15	19	9	3.6	93	debitage
24.94/355.107	-	chert	none	none	-	absent	24	35	13	12.3	93	debitage
24.94/355.108	blade	chert	none	none	-	absent	38	10	5	3.1	93	debitage (unretouched bladelet)
24.94/355.109	blade fragment	chert	none	none	-	absent	28	7	5	1	93	debitage
24.94/355.110	-	chert	none	none	-	absent	23	19	2	6.5	93	debitage
24.94/355.111	-	chert	none	none	-	absent	23	7	2	0.8	93	debitage (unretouched bladelet)
24.94/355.112	flake	chert	none	none	-	absent	30	20	9	6.3	93	debitage
24.94/355.113	-	chert	none	none	-	absent	22	14	2	1.2	93	debitage
24.94/355.114	-	chert	none	none	-	point only	25	35	8	10.9	93	debitage
24.94/355.115	-	chert	none	none	-	absent	57	20	5	8.8	93	debitage
24.94/355.116	-	chert	none	none	-	point only	29	16	7	4.9	93	debitage
24.94/355.117	-	chert	none	none	-	absent	37	12	7	5.3	93	debitage
24.94/355.118	-	chert	none	none	-	absent	12	13	9	3.4	93	debitage
24.94/355.119	-	other	none	none	-	absent	21	19	30	9	93	debitage (possibly slag)
24.94/355.120	-	flint	none	scalar	direct	absent	16	24	8	5.4	65	piece with continuous retouch on one edge
24.94/355.121	blade	chert	none	none	-	convex facetted	40	16	7	6.8	93	debitage (broken blade)
24.94/355.122	-	chert	none	none	-	absent	23	29	28	27.5	93	debitage
24.94/355.123	-	chert	slight patination	scalar	direct	plain	29	23	10	9.2	93	debitage
24.94/355.124	-	chert	none	none	-	absent	24	20	9	6.6	93	debitage
24.94/355.125a	core	chert	none	none	-	absent	23	59	18	24.5	93	debitage
24.94/355.125b	-	chert	none	none	-	plain	32	19	6	5.7	93	debitage
24.94/355.126	-	quartzite	none	none	-	absent	36	28	11	15.9	93	piece of quartzite
24.94/355.127	blade	flint	deep patination	none	-	plain	19	7	2	0.5	93	debitage (unretouched bladelet)
24.94/355.128	burin	flint	burnt	none	-	absent	34	26	10	10.3	95	single burin
24.94/355.129	-	flint	deep patination	none	-	plain	15	5	1	0.1	93	debitage (unretouched bladelet)
24.94/355.130	-	flint	deep patination	sub-parallel	direct	plain	7	18	14	0.8	93	debitage (core trimming flake)
24.94/355.131	-	flint	deep patination	none	-	plain	21	11	4	1	93	debitage

NATIONAL MUSEUMS AND GALLERIES OF WALES: LIST BY ACCESSION NUMBER.

ACC. NO.	PREV. CLASS.	MATERIAL	PATINATION	RETOUCH TYPE	R. POSITION	PLATFORM TYPE	L/mm	W/mm	Th/mm	W/g.	TYPE	CLASSIFICATION
24.94/355.133a	_	flint	deep patination	none	_	plain	8	27	3	1.6	93	debitage (core trimming flake)
24.94/355.133b	blade	flint	deep patination	scalar	direct	plain	22	6	3	0.5	85	backed bladelet
24.94/355.134	trimming flake	flint	slight patination	abrupt	direct	absent	12	24	7	2.6	93	debitage (core trimming flake)
24.94/355.135	blade	flint	deep patination	scalar	direct	absent	19	5	4	0.5	93	debitage (burin spall)
24.94/355.136	_	flint	deep patination	scalar	direct	absent	13	11	5	1.3	93	debitage
24.94/355.137	blade	flint	deep patination	scalar	direct	absent	7	15	3	0.5	93	debitage (core trimming flake)
24.94/355.138	_	flint	deep patination	scalar	direct	absent	6	16	4	0.6	93	debitage (core trimming flake)
24.94/355.139	blade	flint	deep patination	none	_	absent	11	8	4	0.7	93	debitage (blade fragment)
24.94/355.140	flake	flint	deep patination	sub-parallel	inverse	flat-facetted	22	29	7	7	14	shouldered end-scraper
24.94/355.141	flake	flint	deep patination	none	_	absent	34	15	9	7.4	93	debitage (core trimming flake)
24.94/355.142	retouched piece	flint	deep patination	sub-parallel	direct	absent	29	12	4	2.7	65	piece with continuous retouch on one side
24.94/355.143	burin	flint	deep patination	none	_	absent	15	30	9	4.6	28	offset dihedral burin (on core trimming flake)
24.94/355.144	scraper	flint	burnt	none	_	plain	22	20	6	4.2	93	debitage
24.94/355.145	flake	flint	deep patination	none	_	plain	8	7	5	0.6	93	debitage
24.94/355.146	_	flint	deep patination	none	_	plain	20	20	5	3.5	93	debitage
24.94/355.147	core	flint	deep patination	none	_	absent	24	23	9	7.8	106	core
24.94/355.148	_	flint	deep patination	none	_	point only	20	37	11	10.4	106	core fragment
24.94/355.149	burin	flint	deep patination	none	_	plain	12	22	3	1.2	93	debitage (core trimming flake)
24.94/355.150	flake	flint	deep patination	none	_	plain	35	14	3	3.1	93	debitage (unretouched blade)
24.94/355.151	_	flint	deep patination	none	direct	plain	6	16	2	0.3	93	debitage
24.94/355.152	retouched piece	flint	deep patination	scalar & sub-parallel	_	absent	25	11	5	1.7	5	endscraper on retouched blank (atypical)
24.94/355.153	blade	flint	deep patination	none	_	plain	60	10	5	4.3	93	debitage (core trimming flake)
24.94/355.154	blade	flint	deep patination	none	_	absent	44	14	11	10	93	debitage
24.94/355.155	scraper	flint	deep patination	scalar	direct	absent	30	27	7	11.5	93	debitage
24.94/355.156	blade	flint	deep patination	none	_	absent	54	11	7	7.4	93	debitage (unretouched blade)
24.94/355.157	blade	flint	deep patination	sub-parallel	direct	absent	43	22	8	8.7	93	debitage
24.94/355.158	blade	flint	deep patination	none	_	absent	30	8	7	2	93	debitage
24.94/355.159	burin	flint	deep patination	none	_	plain	24	7	4	0.9	93	debitage (burin spall)
24.94/355.160	trimming flake	flint	deep patination	scalar	direct	plain	35	11	8	4.7	93	debitage (core trimming flake)
24.94/355.161	scraper	flint	deep patination	none	_	absent	30	19	6	5.6	93	debitage
24.94/355.162	flake	flint	deep patination	none	_	plain	29	20	10	8.9	93	debitage
24.94/355.163	core	flint	deep patination	none	_	point only	20	15	10	4.6	106	bladelet core
24.94/355.164	core	flint	deep patination	none	_	absent	33	18	11	10.9	106	bladelet core fragment (on beach pebble)
24.94/355.165	flake	flint	none	none	_	absent	22	10	4	1.5	93	debitage
24.94/355.166	retouched piece	flint	deep patination	scalar	direct	plain	24	12	8	3.3	66	piece with continuous retouch on both edges
24.94/355.167	blade	flint	deep patination	scalar	direct	absent	18	8	3	0.7	93	debitage (core trimming flake)
24.94/355.168	flake	flint	deep patination	none	_	point only	31	26	17	16.5	93	debitage (core trimming flake)
24.94/355.169	retouched flake	flint	deep patination	sub-parallel	direct	absent	28	10	7	2.1	93	debitage
24.94/355.170	scraper	flint	deep patination	sub-parallel	bifacial	absent	24	12	5	3	93	debitage
24.94/355.171	_	flint	deep patination	none	_	dihedral	45	33	13	15.9	93	debitage
24.94/355.172	flake	flint	deep patination	none	_	plain	42	32	8	7.8	93	debitage
24.94/355.173	_	flint	deep patination	scalar	direct	absent	35	20	6	2.7	2	atypical end-scraper
24.94/355.174	_	flint	deep patination	none	_	absent	33	18	7	4.8	93	debitage
24.94/355.175	_	flint	deep patination	abrupt	direct	dihedral	31	21	8	5.3	60	straight truncation
24.94/355.176	scraper	flint	deep patination	scalar	direct	absent	31	20	7	4.4	65	piece with continuous retouch on one edge
24.94/355.177	burin spall	flint	deep patination	scalar	direct	absent	32	8	4	1.3	93	debitage (burin spall)
24.94/355.178	blade	flint	deep patination	none	_	absent	36	10	3	2.5	93	debitage (unretouched blade)
24.94/355.179	_	flint	burnt	none	_	absent	17	15	15	2.5	93	debitage
24.94/355.180	blade	flint	deep patination	sub-parallel	direct	plain	11	32	4	1.5	93	debitage (core trimming flake)
24.94/355.181	_	flint	deep patination	none	_	absent	29	15	5	2.7	93	debitage
24.94/355.182	core	flint	deep patination	none	_	absent	35	26	20	29.7	106	pebble core
24.94/355.183	blade	flint	deep patination	none	_	plain	24	5	4	0.7	93	debitage (burin spall)
24.94/355.184	blade	flint	deep patination	none	_	absent	25	6	3	0.7	93	debitage

APPENDIX II: Catalogue of Finds.

NATIONAL MUSEUMS AND GALLERIES OF WALES: LIST BY ACCESSION NUMBER.

ACC. NO.	PREV. CLASS.	MATERIAL	PATINATION	RETOUCH TYPE	R. POSITION	PLATFORM TYPE	L/mm	W/mm	Th/mm	W/g.	TYPE	CLASSIFICATION
24.94/355.186	burin	flint	burnt	none	_	plain	30	13	5	3	93	debitage
24.94/355.187	burin	flint	deep patination	none	direct	absent	15	4	4	1.3	28	offset dihedral burin (broken)
24.94/355.188	flake	flint	deep patination	none	_	plain	33	36	7	6.3	93	debitage
24.94/355.189	_	flint	deep patination	none	_	absent	59	26	11	0.7	93	debitage (trimming flake)
24.94/355.190	_	flint	deep patination	none	_	absent	10	11	3	0.3	93	debitage
24.94/355.191	blade	flint	deep patination	none	_	absent	12	5	1	0.2	93	debitage (unretouched bladelet)
24.94/355.192	burnt flake	flint	burnt	none	_	absent	25	15	6	2.6	30	burin on a break
24.94/355.193	retouched piece	flint	deep patination	scalar	direct	absent	28	15	7	3.7	93	debitage
24.94/355.194	core fragment	flint	deep patination	none	_	plain	25	13	6	2.8	93	debitage
24.94/355.195	_	flint	none	none	_	plain	58	18	5	7.9	93	debitage (unretouched blade)
24.94/355.196	flake	rhyolite	none	none	_	plain	37	23	9	12.5	93	debitage
24.94/355.197	core fragment	flint	deep patination	sub-parallel	direct	absent	23	30	13	11.7	106	bladelet core
24.94/355.198	_	flint	deep patination	scalar	inverse	point only	17	26	9	5.9	93	debitage
24.94/355.199	flake fragment	flint	slight patination	scalar	direct	dihedral	35	14	16	9.5	93	debitage
24.94/355.200	blade	flint	deep patination	scalar	direct	plain	34	11	5	3.1	65	piece with continuous retouch on one side
24.94/355.201	flake	flint	deep patination	sub-parallel	direct	absent	11	32	2	2.7	93	debitage (core trimming flake)
24.94/355.202	core	flint	slight patination	none	_	absent	18	35	17	13.4	106	flake core
24.94/355.203	_	flint	deep patination	none	_	absent	14	3	1	0.2	93	debitage (secondary burin spall)
24.94/355.204	flake	flint	deep patination	scalar	inverse	plain	32	10	7	3.4	93	debitage
24.94/355.205	scraper	flint	deep patination	none	_	absent	13	28	9	3.2	93	debitage
24.94/355.206	burnt flake	flint	burnt	none	_	absent	17	3	4	1.4	93	debitage
24.94/355.207	_	flint	deep patination	none	_	plain	45	25	10	11.4	93	debitage
24.94/355.208	burin spall	flint	deep patination	none	_	point only	20	2	3	0.3	93	debitage (secondary burin spall)
24.94/355.209	core	flint	deep patination	none	_	plain	29	20	15	8.9	106	flake core
24.94/355.210	_	flint	deep patination	none	_	point only	52	20	11	14	93	debitage
24.94/355.211	_	flint	deep patination	scalar	bifacial	absent	34	10	4	1.6	93	debitage (core trimming flake)
24.94/355.212	_	flint	deep patination	none	_	dihedral	54	29	13	14	93	debitage (core trimming flake)
24.94/355.213	_	flint	burnt	none	_	plain	24	17	7	3.3	93	debitage
24.94/355.214	_	flint	burnt	none	_	plain	45	24	6	6.2	93	debitage
24.94/355.215	blade	flint	deep patination	none	_	plain	65	22	12	16.2	93	debitage (trimming flake)
24.94/355.216	broken flake	flint	deep patination	sub-parallel	direct	absent	19	32	6	3.2	93	debitage
24.94/355.217	flake	flint	deep patination	none	_	plain	44	20	7	9	93	debitage
24.94/355.218	side scraper	flint	deep patination	scalar	bifacial	absent	43	35	11	14.8	69	bifacially worked piece (possible leaf point fragment)
24.94/355.219	burin	rhyolite	none	none	_	absent	47	28	8	10	93	debitage
24.94/355.220	_	flint	deep patination	none	_	plain	30	11	8	2.7	93	debitage
24.94/355.221	burin spall	flint	deep patination	abrupt	direct	plain	20	4	3	0.6	93	debitage (burin spall)
24.94/355.222	_	flint	none	scalar	direct	plain	27	15	10	6.2	61	oblique truncation
24.94/356	_	flint	deep patination	scalar	direct	absent	22	7	3	21.2	93	debitage (core trimming flake)
24.94/365a	_	flint	deep patination	none	_	dihedral	50	32	13	8.9	93	debitage
24.94/365b	_	chert	none	scalar	bifacial	absent	35	29	13	4.9	93	debitage
24.94/365c	_	flint	deep patination	none	_	plain	40	28	2	46.2	93	debitage (unretouched bladelet)
24.94/366	_	flint	burnt	none	_	absent	30	23	5	32.5	93	debitage
24.94/380	_	flint	deep patination	none	_	point only	6	23	5	1.1	93	debitage (unretouched bladelet)
24.94/a	_	chert	none	none	_	point only	30	27	18	13.5	93	debitage
24.94/b	_	chert	none	none	_	absent	24	12	9	0.4	93	debitage
24.94/c	_	rhyolite	none	none	_	plain	23	13	3	0.5	93	debitage
24.94/396	backed tool	flint	deep patination	abrupt	direct	absent	20	11	4	14.9	85	backed bladelet (fragment)
24.94/d	_	chert	none	none	_	absent	15	12	5	18.0	93	debitage
24.94/e	_	chert	none	none	_	absent	24	20	13	0.6	93	debitage

APPENDIX II: Catalogue of Finds.

NATIONAL MUSEUM AND GALLERIES OF WALES: LIST BY ACCESSION NUMBER.

ACC. NO.	PREV. CLASS.	MATERIAL	PATINATION	RETOUCH TYPE	R. POSITION	PLATFORM TYPE	L/mm	W/mm	Th/mm	W/g.	TYPE	CLASSIFICATION
34.568/1	_	flint	deep patination	abrupt	inverse	flat facetted	23	19	6	3.7	65	piece with continuous retouch on one edge
34.568/2	_	flint	slight patination	sub-parallel	inverse	plain	30	29	9	3.7	8	flake end-scraper
34.568/3	_	flint	slight patination	invasive stepped scalar	direct	point only	32	21	8	0.6	107	single burin
34.568/4	_	chert	none	sub-parallel	inverse	absent	52	28	7	1.3	2	atypical end-scraper
34.568/5	_	flint	deep patination	abrupt	inverse	absent	18	13	5	2.3	93	debitage
34.568/6	_	rhyolite	none	sub-parallel	direct	absent	21	29	16	10.2	93	debitage
34.568/7	_	flint	slight patination	sub-parallel	direct	dihedral	29	34	10	13.3	93	debitage
34.568/8	_	flint	slight patination	none	_	plain	40	30	7	6.5	93	debitage
34.568/9	_	rhyolite	none	none	_	point only	34	37	8	4	93	debitage
34.568/10	_	flint	deep patination	none	_	absent	30	16	15	10.7	106	core
34.568/11	_	flint	slight patination	scalar	direct	plain	35	17	12	6.4	93	debitage
34.568/12	_	chert	none	sub-parallel	direct	absent	21	16	9	11.5	2	atypical end-scraper
34.568/13	_	rhyolite	none	scalar	direct	absent	41	22	10	1.8	93	debitage
34.568/14	_	flint	deep patination	sub-parallel	direct	absent	7	22	9	7.7	17	end-scraper - burin
34.568/15	_	flint	deep patination	none	_	plain	24	8	4	13.3	93	debitage
34.568/16	_	rhyolite	none	none	_	absent	20	12	5	6.5	93	debitage
34.568/17	_	flint	deep patination	abrupt	inverse	plain	8	6	4	15.1	23	piercer
34.568/18	_	flint	deep patination	abrupt	direct	plain	29	20	4	9	23	piercer
34.568/19	_	flint	deep patination	scalar	direct	absent	24	22	7	10.1	65	piece with continuous retouch on one edge
34.568/20	_	flint	deep patination	none	_	point only	35	22	8	5	93	debitage
34.568/21a	_	flint	deep patination	none	_	plain	46	27	9	12.2	93	debitage
34.568/21b	_	flint	deep patination	none	_	convex facetted	41	26	4	11.8	93	debitage
34.568/22	_	flint	slight patination	none	_	plain	53	21	10	1.5	93	debitage
34.568/23	_	flint	slight patination	none	_	absent	39	17	9	1.4	93	debitage
34.568/24	_	flint	deep patination	abrupt	inverse	plain	18	16	5	0.8	62	concave truncation
34.568/25	_	flint	deep patination	scalar	direct	absent	37	29	10	3.9	64	double truncation
34.568/26	_	flint	deep patination	abrupt	inverse	absent	12	10	4	5.3	93	debitage
34.568/27	_	flint	burnt	none	_	point only	22	10	3	6	93	debitage
34.568/28	_	flint	deep patination	sub-parallel	direct	convex facetted	27	18	9	11.8	93	debitage (possible leaf point fragment)
34.568/29	_	other	none	abrupt	inverse	plain	49	22	7	5.1	60	straight truncation (broken and glued)
34.568/30	_	flint	slight patination	none	_	absent	30	20	7	12.3	93	debitage
34.568/31	_	flint	deep patination	abrupt	inverse	absent	57	29	8	8.3	93	debitage
34.568/32	_	flint	deep patination	scalar	bifacial	point only	25	18	12	2	93	debitage
34.568/33	_	flint	deep patination	none	_	point only	20	19	5	7.1	93	debitage
34.568/34	_	flint	deep patination	none	_	plain	38	20	7	0.6	27	dihedral straight burin
34.568/35	_	chert	none	none	_	absent	32	23	4	0.8	93	debitage
34.568/36	_	chert	none	none	_	absent	16	18	8	2.5	93	debitage
34.568/37	_	flint	deep patination	none	_	absent	20	10	6	5.7	93	debitage
34.568/38	_	flint	slight patination	none	_	absent	15	19	4	2.1	93	debitage

APPENDIX II: Catalogue of Finds.

NATIONAL MUSEUMS AND GALLERIES OF WALES:LIST BY ACCESSION NUMBER.

ACC. NO.	PREV. CLASS.	MATERIAL	PATINATION	RETOUCH TYPE	R. POSITION	PLATFORM TYPE	L/mm	W/mm	Th/mm	W/g.	TYPE	CLASSIFICATION
60.96/1	scraper	flint	slight patination	none	_	point only	31	32	13	15.4	93	debitage
60.96/2	core	flint	slight patination	none	_	absent	37	40	37	48.6	106	core
60.96/3	core	flint	deep patination	sub-parallel	direct	dihedral	17	31	20	6.7	12	atypical carinated end-scraper
60.96/4	_	flint	deep patination	none	_	point only	46	44	25	5.2	106	core
60.96/5	_	flint	deep patination	sub-parallel	direct	plain	40	50	15	7.9	106	core
60.96/6a	unworked blade	flint	deep patination	none	_	plain	48	11	3	2.6	93	debitage
60.96/6b	unworked blade	flint	deep patination	none	_	plain	36	18	6	4.4	93	debitage
60.96/6c	unworked blade	flint	deep patination	none	_	absent	26	9	2	0.6	93	debitage
60.96/6d	unworked blade	flint	deep patination	abrupt	direct	absent	42	12	5	1.9	61	oblique truncation
60.96/6e	unworked blade	flint	deep patination	none	_	absent	22	24	3	3.5	93	debitage (broken blade)
60.96/6f	unworked blade	flint	deep patination	none	_	absent	19	17	2	4.5	93	debitage (broken blade)
60.96/6g	unworked blade	flint	deep patination	none	_	absent	42	15	6	2.1	93	debitage (broken blade)
60.96/6h	_	flint	slight patination	none	_	flat facetted	47	17	6	2.1	28	offset dihedral burin
60.96/7 .1	_	bone	_	_	_	_	_	_	_	_	_	bone fragment
60.96/7 .2	_	flint	deep patination	none	_	absent	20	16	2	0.2	93	debitage
60.96/7 .3	_	flint	slight patination	none	_	plain	34	16	3	10.6	93	debitage
60.96/7 .4	_	flint	deep patination	none	_	plain	17	4	4	54.1	93	debitage (burin spall)
60.96/7 .5	_	flint	deep patination	none	_	point only	31	6	4	33.7	93	debitage (burin spall)
60.96/7 .6	_	flint	deep patination	scalar	_	point only	38	17	20	1	106	core
60.96/7 .7	_	flint	deep patination	none	direct	absent	22	6	5	3.4	93	debitage (burin spall)
60.96/7 .8	_	quartzite	none	none	_	plain	8	5	4	0.6	93	debitage
60.96/7 .9	_	flint	deep patination	none	_	point only	8	33	5	1.8	93	debitage
60.96/7 .10	_	flint	deep patination	sub-parallel	_	plain	42	49	30	2.7	106	core
60.96/7 .11	_	flint	slight patination	none	direct	dihedral	10	18	4	1.1	93	debitage (thinning flake)
60.96/7 .12	_	flint	deep patination	none	_	plain	18	12	3	4.9	93	debitage
60.96/7 .13	_	flint	deep patination	none	_	absent	24	21	4	7	93	debitage
60.96/7 .14	_	flint	deep patination	none	_	absent	29	20	6	1.4	93	debitage
60.96/7 .15	_	flint	deep patination	none	_	plain	25	28	6	0.2	93	debitage
60.96/7 .16	_	flint	deep patination	none	_	flat facetted	17	24	5	2.1	93	debitage
60.96/7 .17	_	flint	deep patination	scalar	_	dihedral	12	19	4	0.4	93	debitage (thinning flake)
60.96/7 .18	_	flint	deep patination	none	direct	point only	30	27	10	0.7	65	piece with continuous retouch on one edge
60.96/7 .19	_	flint	slight patination	none	_	point only	15	34	10	19.7	93	debitage (thinning flake)
60.96/7 .20	_	flint	deep patination	none	_	plain	36	18	19	0.5	106	core
60.96/7 .21	_	flint	deep patination	none	_	plain	40	15	5	0.4	93	debitage
60.96/7 .22	_	flint	deep patination	none	_	absent	15	20	4	4.4	93	debitage
60.96/7 .23	_	flint	deep patination	none	_	absent	23	20	5	111.7	93	debitage
60.96/7 .24	_	unknown	deep patination	none	_	flat facetted	29	23	4	0.8	93	debitage
60.96/7 .25	_	flint	deep patination	none	_	absent	22	10	5	0.4	93	debitage
60.96/7 .26	_	flint	deep patination	none	_	absent	20	21	5	2.7	93	debitage
60.96/7 .27	_	flint	deep patination	scalar	direct	absent	10	19	4	3.9	93	debitage (possible retouched notch)
60.96/7 .28	_	flint	deep patination	none	_	point only	23	13	2	3.6	93	debitage
60.96/7 .29	_	flint	deep patination	none	_	flat facetted	15	25	11	2	93	debitage
60.96/7 .30	_	flint	deep patination	none	_	plain	29	17	12	0.7	93	debitage (trimming flake)

APPENDIX II: Catalogue of Finds.

NATIONAL MUSEUMS AND GALLERIES OF WALES:LIST BY ACCESSION NUMBER.

ACC. NO.	PREV. CLASS.	MATERIAL	PATINATION	RETOUCH TYPE	R. POSITION	PLATFORM TYPE	L/mm	W/mm	Th/mm	W/g.	TYPE	CLASSIFICATION
60.96/7 .31	_	flint	deep patination	none	_	absent	21	11	4	8.1	93	debitage
60.96/7 .32	_	flint	deep patination	none	_	absent	19	12	2	6	93	debitage
60.96/7 .33	_	chert	slight patination	none	_	absent	26	25	9	13.7	93	debitage
60.96/7 .34	_	flint	slight patination	none	_	plain	18	23	6	3.7	93	debitage
60.96/7 .35	_	flint	deep patination	none	_	absent	14	9	2	1.6	93	debitage
60.96/7 .36	_	flint	slight patination	scalar	bifacial	dihedral	25	18	7	2.8	65	piece with continuous retouch on one edge
60.96/7 .37	_	flint	deep patination	none	_	absent	25	15	8	3.4	93	debitage
60.96/7 .38	_	chert	none	abrupt	_	absent	20	8	25	1.2	93	debitage
60.96/7 .39	_	flint	slight patination	none	direct	absent	25	24	6	2	93	debitage
60.96/7 .40	_	other	slight patination	none	_	plain	20	15	5	1	93	debitage
60.96/7 .41	_	flint	slight patination	none	_	point only	17	15	1	0.7	93	debitage (squamous flake)
60.96/7 .42	_	flint	deep patination	none	_	plain	22	16	5	4.1	93	debitage
60.96/7 .43	_	flint	deep patination	none	_	point only	19	16	3	5.6	93	debitage
60.96/7 .44	_	flint	deep patination	none	_	dihedral	10	17	4	1	93	debitage
60.96/7 .45	_	flint	deep patination	none	_	absent	14	19	4	0.7	93	debitage
60.96/7 .46	_	flint	deep patination	none	_	plain	13	17	2	7.4	93	debitage
60.96/7 .47	_	flint	deep patination	none	_	flat facetted	32	10	6	2.6	93	debitage (trimming flake)
60.96/7 .48	_	flint	deep patination	none	_	plain	23	25	4	0.3	93	debitage
60.96/7 .49	_	chert	deep patination	none	_	absent	25	23	5	2.6	93	debitage
60.96/7 .50	_	flint	deep patination	none	_	absent	20	11	1	3.1	93	debitage (thinning flake)
60.96/7 .51	_	chert	deep patination	none	_	absent	20	19	7	4.1	93	debitage (broken blade)
60.96/7 .52	_	flint	deep patination	none	_	plain	22	22	19	5.7	15	core-like end-scraper
60.96/7 .53	_	flint	deep patination	none	_	absent	29	7	6	1.8	93	debitage
60.96/7 .54	_	flint	deep patination	sub-parallel	direct	dihedral	21	17	3	0.5	93	debitage
60.96/7 .55	_	flint	deep patination	none	_	absent	22	24	4	1.7	93	debitage
60.96/7 .56	_	flint	deep patination	none	_	absent	19	22	8	1	93	debitage
60.96/7 .57	_	flint	deep patination	none	_	absent	18	12	4	1.7	93	debitage (broken blade)
60.96/7 .58	_	flint	deep patination	none	_	absent	13	16	3	0.9	93	debitage
60.96/7 .59	_	flint	deep patination	none	_	absent	17	10	2	1	93	debitage
60.96/7 .60	_	flint	deep patination	none	_	flat facetted	31	19	4	2.3	93	debitage
60.96/7 .61	_	flint	deep patination	none	_	plain	19	17	6	3.4	93	debitage
60.96/7 .62	_	chert	slight patination	none	_	plain	27	26	15	3	106	core
60.96/7 .63	_	flint	deep patination	sub-parallel	inverse	plain	39	25	10	0.3	14	flat nosed endscraper
60.96/7 .64	_	flint	deep patination	none	_	absent	30	13	3	2.8	93	debitage
60.96/7 .65	_	flint	deep patination	none	_	dihedral	19	32	7	5.7	93	debitage
60.96/7 .66	_	flint	deep patination	s-l s s	_	dihedral	29	19	8	5.5	93	debitage
60.96/7 .67	_	flint	deep patination	none	_	point only	19	35	4	0.9	93	debitage
60.96/7 .68	_	flint	deep patination	none	_	point only	22	6	3	2.7	93	debitage (burin spall)
60.96/7 .69	_	flint	deep patination	sub-parallel	direct	point only	10	21	4	2.9	1	end-scraper (broken)
60.96/7 .70	_	flint	deep patination	none	_	flat facetted	28	20	7	1	93	debitage
60.96/7 .71	_	flint	deep patination	none	_	plain	15	19	12	0.5	93	debitage
60.96/7 .72	_	flint	deep patination	none	_	absent	37	24	10	0.4	93	debitage
60.96/7 .73	_	flint	deep patination	none	_	absent	40	18	8	2.8	93	debitage

NATIONAL MUSEUMS AND GALLERIES OF WALES:LIST BY ACCESSION NUMBER.

ACC. NO.	PREV. CLASS.	MATERIAL	PATINATION	RETOUCH TYPE	R. POSITION	PLATFORM TYPE	L/mm	W/mm	Th/mm	W/g.	TYPE	CLASSIFICATION
60.96/7 .74	_	flint	deep patination	none	_	point only	17	31	5	1.6	30	burin on a break
60.96/7 .75	_	flint	deep patination	none	_	point only	24	17	4	12.7	93	debitage (thinning flake)
60.96/7 .76	_	flint	deep patination	scalar	direct	point only	27	20	8	8.7	65	piece with continuous retouch on one edge
60.96/7 .77	_	flint	deep patination	none	_	point only	17	18	10	1.8	93	debitage
60.96/7 .78	_	flint	deep patination	none	_	point only	18	32	2	5.1	93	debitage (thinning flake)
60.96/7 .79	_	flint	deep patination	none	_	point only	43	26	17	2.9	106	core
60.96/7 .80	_	flint	deep patination	none	_	absent	19	22	12	2.8	93	debitage
60.96/7 .81	_	flint	deep patination	sub-parallel	direct	absent	21	24	10	0.2	93	debitage
60.96/7 .82	_	flint	deep patination	none	_	absent	32	23	7	1.3	93	debitage
60.96/7 .83	limestone	other	none	none	_	absent	31	13	7	4.2	93	debitage
60.96/7 .84	_	flint	slight patination	none	_	absent	30	20	9	5.1	93	debitage
60.96/7 .85	_	flint	slight patination	none	_	plain	29	17	6	7.8	28	offset dihedral burin (atypical)
60.96/7 .86	_	flint	deep patination	none	_	absent	20	25	4	5.8	93	debitage
60.96/7 .87	_	flint	deep patination	none	_	point only	22	9	8	2	93	debitage (burin spall)
60.96/7 .88	_	flint	deep patination	none	_	plain	23	32	8	1.3	93	debitage
60.96/7 .89	_	flint	none	none	_	absent	25	19	6	5.3	106	core
60.96/7 .90	_	flint	none	none	_	absent	15	16	4	4.3	93	debitage (trimming flake)
60.96/7 .91	_	flint	deep patination	none	_	absent	19	30	8	1.2	93	debitage
60.96/7 .92	_	flint	deep patination	none	_	absent	22	15	5	18.4	93	debitage
60.96/7 .93	_	flint	deep patination	none	_	plain	18	7	5	7.4	93	debitage (burin spall)
60.96/7 .94	_	flint	deep patination	none	_	absent	16	12	2	5.8	93	debitage
60.96/7 .95	_	flint	deep patination	none	_	absent	21	18	8	7	93	debitage (broken blade)
60.96/7 .96	_	flint	deep patination	none	direct	plain	29	23	13	2.8	93	debitage
60.96/7 .97	_	flint	deep patination	scalar	_	absent	25	18	4	5.6	93	debitage (thinning flake)
60.96/7 .98	_	flint	deep patination	none	_	dihedral	16	15	17	3.8	93	debitage (burin spall)
60.96/7 .99	_	flint	deep patination	none	_	plain	34	26	10	3.4	93	debitage
60.96/7 .100	_	flint	deep patination	none	_	absent	17	16	4	2	93	debitage
60.96/7 .101	_	flint	deep patination	none	_	point only	22	24	12	7.1	93	debitage
60.96/7 .102	_	flint	deep patination	none	_	point only	32	48	14	4.1	93	debitage
60.96/7 .103	_	flint	deep patination	none	_	absent	15	25	6	0.9	93	debitage
60.96/7 .104	_	flint	deep patination	none	_	point only	16	20	5	4.6	93	debitage
60.96/7 .105	_	flint	deep patination	none	_	convex facetted	39	19	18	1.9	93	debitage
60.96/7 .106	_	flint	deep patination	none	_	plain	23	15	7	2.1	93	debitage (trimming flake)
60.96/7 .107	_	flint	deep patination	none	_	absent	26	18	10	0.7	93	debitage
60.96/8 .1	flake	rhyolite	none	none	_	absent	29	30	6	0.6	93	debitage
60.96/8 .2	_	chert	none	none	_	absent	33	22	17	14.7	106	core
60.96/8 .3	flake	flint	none	none	_	plain	25	18	9	1.4	69	leaf point fragment
60.96/8 .4	flake	chert	none	none	_	plain	42	38	18	0.3	93	debitage
60.96/8 .5	_	flint	none	none	_	absent	28	9	7	10.3	93	debitage
60.96/8 .6	_	chert	none	none	_	absent	28	19	4	1.4	93	debitage
60.96/8 .7	_	chert	none	none	_	point only	19	21	4	6.9	93	debitage
60.96/8 .8	_	chert	none	none	_	absent	13	26	17	18.8	93	debitage
60.96/8 .9												

APPENDIX II: Catalogue of Finds.

NATIONAL MUSEUMS AND GALLERIES OF WALES:LIST BY ACCESSION NUMBER.

ACC. NO.	PREV. CLASS.	MATERIAL	PATINATION	RETOUCH TYPE	R. POSITION	PLATFORM TYPE	L/mm	W/mm	Th/mm	W/g.	TYPE	CLASSIFICATION
60.96/8 .10	flake	chert	slight patination	none	direct	point only	44	29	10	1.4	93	debitage
60.96/8 .11	_	chert	none	scalar	_	absent	15	21	6	15.7	66	piece with continuous retouch on both edges
60.96/8 .12	flake	flint	none	none	_	absent	43	32	17	4.6	93	debitage
60.96/8 .13	stone	rhyolite	none	none	_	absent	15	10	3	5.3	93	debitage (broken blade)
60.96/8 .14	flake	rhyolite	none	none	_	plain	43	27	10	1.3	93	debitage
60.96/8 .15	flake	unknown	none	none	direct	plain	55	12	7	25.6	28	offset dihedral burin (atypical)
60.96/8 .16	flake	chert	none	sub-parallel	_	point only	32	15	10	4.1	93	debitage
60.96/8 .17	_	rhyolite	none	none	_	absent	26	17	10	34.7	93	debitage
60.96/8 .18	stone	chert	none	none	_	absent	35	27	5	2.3	93	debitage
60.96/8 .19	_	rhyolite	none	none	_	absent	42	27	26	2.7	93	debitage
60.96/9	_	flint	deep patination	none	_	absent	9	15	1	15.4	93	debitage (thinning flake)
60.96/83	_	quartzite	none	none	_	plain	24	12	7	48.7	93	debitage

APPENDIX II: Catalogue of Finds.

NATIONAL MUSEUMS AND GALLERIES OF WALES: LIST BY ACCESSION NUMBER.

ACC. NO.	PREV. CLASS.	MATERIAL	PATINATION	RETOUCH TYPE	R. POSITION	PLATFORM TYPE	L/mm	W/mm	Th/mm	W/g.	TYPE	CLASSIFICATION
50.406/1	_	flint	deep patination	none	_	absent	51	25	12	35	65	piece with continuous retouch on one side
50.406/2	_	flint	deep patination	scalar	direct	absent	32	17	7	36	93	debitage
50.406/3	graver	flint	deep patination	none	_	flat facetted	31	19	4	39	28	offset dihedral burin
50.406/4	_	flint	deep patination	none	_	flat facetted	28	15	7	13.3	13	single end-scraper
50.406/5	_	flint	deep patination	sub-parallel	direct	absent	33	30	5	2.1	93	debitage
50.406/6	_	flint	slight patination	none	_	point only	31	34	7	19.6	1	single end-scraper
50.406/7	_	flint	deep patination	sub-parallel	direct	plain	42	26	10	0.7	2	atypical end-scraper
50.406/8	_	flint	deep patination	sub-parallel	direct	convex facetted	36	23	8	18	93	debitage
50.406/9	_	flint	deep patination	none	_	flat facetted	35	25	8	5.1	93	debitage (thinning flake)
50.406/10	_	flint	deep patination	none	_	flat facetted	56	39	7	5.9	1	single end-scraper
50.406/11*	_	rhyolite	none	sub-parallel	direct	absent	48	19	7	3.8	4	ogival end-scraper*
50.406/12a	_	flint	deep patination	sub-parallel	direct	flat facetted	41	26	8	5.4	14	single end-scraper
50.406/12b	_	flint	deep patination	scalar	direct	flat facetted	28	20	7	39.1	93	debitage
50.406/14	_	rhyolite	none	sub-parallel	direct	absent	40	28	10	3.2	93	debitage
50.406/15	_	other	none	sub-parallel	inverse	point only	38	15	5	4.1	65	piece with continuous retouch on one side
50.406/16	_	flint	slight patination	none	_	point only	51	13	6	13.8	93	debitage
50.406/17	_	flint	deep patination	none	_	absent	57	14	4	4.4	93	debitage
50.406/18	_	flint	slight patination	none	_	plain	43	16	6	4.3	93	debitage
50.406/19	_	flint	deep patination	none	_	point only	19	14	5	2.9	93	debitage
50.406/20a	_	flint	deep patination	scalar	direct	absent	34	12	6	3.4	93	debitage
50.406/20b	sidescraper	flint	none	sub-parallel	direct	absent	4	15	5	20.9	93	debitage
50.406/23 1	flake	chert	none	none	_	convex facetted	52	31	17	17.8	106	core
50.406/23 2	_	other	deep patination	none	_	absent	24	23	28	9.1	93	debitage
50.406/23 3	flake	flint	none	none	_	absent	19	26	8	10.2	93	debitage
50.406/23 4	flake	flint	none	sub-parallel	direct	plain	30	14	4	18.4	93	debitage
50.406/23 5	flake	other	none	scalar	direct	absent	27	35	9	8.5	4	ogival end-scraper
50.406/23 6	flake	chert	burnt	none	_	plain	32	24	12	13	93	debitage
50.406/23 7	flake	other	slight patination	none	_	plain	22	18	14	6.3	93	debitage
50.406/23 8	_	flint	deep patination	none	_	flat facetted	40	16	10	15.7	93	debitage
50.406/23 9	flake	flint	none	sub-parallel	direct	plain	41	31	9	4.1	93	debitage (thinning flake)
50.406/23 10	knife	chert	none	scalar	direct	plain	18	9	5	4.1	93	debitage
50.406/23 11	flake	other	none	none	_	plain	45	20	13	3.7	93	debitage
50.406/23 12	_	rhyolite	slight patination	none	_	convex facetted	23	19	11	4.3	93	debitage
50.406/23 13	flake	chert	none	none	_	plain	35	21	9	1.6	93	debitage
50.406/23 14	flake	chert	none	abrupt	inverse	plain	36	22	13	3.8	93	debitage
50.406/23 15	_	chert	none	none	_	plain	19	21	8	2.9	65	piece with continuous retouch on one side (red colouration)
50.406/23 16	flake	rhyolite	none	none	_	absent	21	27	16	31.4	93	debitage
50.406/23 17	_	rhyolite	none	none	_	point only	30	27	44	19.4	93	debitage
50.406/23 18	blade fragment	chert	none	scalar	direct	plain	34	23	12	6	93	debitage
50.406/23 19	blade fragment	chert	none	sub-parallel	direct	absent	27	13	7	2.7	93	debitage
50.406/23 20	flake	rhyolite	none	none	_	convex facetted	78	27	7	8.7	93	debitage
50.406/23 21	_	chert	deep patination	none	_	absent	30	20	8	10.2	93	debitage
50.406/23 22	flake	flint	none	none	_	absent	23	7	11	5.7	93	debitage
50.406/23 23	scraper	chert	deep patination	none	_	plain	28	20	9	7.7	93	debitage
50.406/23 24	flake	chert	none	none	_	absent	35	34	14	14.2	93	debitage
50.406/23 25	_	rhyolite	none	none	_	plain	37	45	7	0.8	93	debitage
50.406/23 26	_	other	slight patination	none	_	plain	47	17	16	14	93	debitage
50.406/23 27	flake	flint	none	none	_	point only	33	28	11	6.3	93	debitage
50.406/23 28	_	rhyolite	deep patination			point only	59	32	6	20.7	93	debitage
											65	piece with continuous retouch on one side

APPENDIX II: Catalogue of Finds.

NATIONAL MUSEUMS AND GALLERIES OF WALES:LIST BY ACCESSION NUMBER.

ACC. NO.	PREV. CLASS.	MATERIAL	PATINATION	RETOUCH TYPE	R. POSITION	PLATFORM TYPE	L/mm	W/mm	Th/mm	W/g.	TYPE	CLASSIFICATION
58.428/5	blade	flint	none	none	_	absent	67	25	9	_	93	debitage
78.47 h/8	_	rhyolite	none	s-l s s	direct	absent	55	38	21	17.5	13	thick nosed end-scraper
15.277/8a	graver	flint	slight patination	sub-parallel	direct	absent	37	27	8	7.1	107	simple burin
15.277/8b	_	flint	slight patination	abrupt	inverse	absent	50	15	6	5.7	19	burin- truncated blade
15.277/8c	_	flint	slight patination	scalar	direct	point only	48	9	10	5.6	65	piece with continuous retouch on one edge
15.277/8d	blade	flint	slight patination	none	_	point only	41	25	4	4.4	93	debitage
15.277/8e	_	flint	slight patination	scalar	direct	flat facetted	40	26	11	_	65	piece with continuous retouch on one edge
15.277/8f	blade	chert	none	none	_	absent	42	18	4	3.3	93	debitage
15.277/8g	endscraper	flint	slight patination	scalar	direct	point only	37	22	8	7.8	1	single end-scraper
15.277/8h	_	flint	deep patination	none	_	point only	23	40	2	4.8	93	debitage
15.277/8i	rostrate scraper	flint	slight patination	scalar	inverse	point only	53	27	6	11	1	single endscraper
98.18/1*	large flake	chert	none	_	_	point only	90	113	28	303	93	debitage (large proto-Levallois flake)
61.382.a	as bone	flint	slight patination	_	_	absent	20	12	3	0.5	93	debitage
61.382.b	as bone	flint	burnt	_	_	absent	17	22	8	4.4	93	debitage
61.382.c	as bone	flint	slight patination	_	_	absent	13	10	2	0.3	93	debitage

APPENDIX III Catalogue of Finds

OXFORD UNIVERSITY MUSEUM LIST BY ACCESSION NUMBER

ACC. NO.	PREV. CLASS.	MATERIAL	PATINATION	RETOUCH TYPE	R. POSITION	PLATFORM TYPE	L/mm	W/mm	Th/mm	W/g	TYPE	FIGURED	NEW CLASSIFICATION
s 290	Mousterian ovoid flake	flint	deep patination	scalar	direct	dihedral	180	56	26	143	93	a1	large flake
s 290	Mousterian	chert	none	scalar	direct	plain	31	29	9	16	8	_	flake end-scraper
s 291	Mousterian	flint	deep patination	scalar	direct	dihedral	31	31	14	18	8	a2	flake end-scraper
s 292	Mousterian	chert	none	scalar	direct	point only	40	61	14	53	93	a15	retouched piece
s 293	Mousterian	chert	none	scalar	direct	flat facetted	49	31	17	27	14	a20	flat nosed end-scraper
s 295	Mousterian	chert	none	none	_	absent	49	24	8	7	95	a16	single burin
s 296	Mousterian	chert	none	scalar	direct	absent	40	26	14	10	93	a18	debitage
s 297	Mousterian	chert	none	scalar	bifacial	absent	44	39	13	18	93	a22	debitage
s 298	Mousterian	chert	none	none	_	plain	28	35	13	18	93	a17	debitage
s 299	Mousterian	chert	none	none	_	plain	30	26	10	10	93	a7	debitage
s 300	Mousterian	chert	none	sub-parallel	direct	absent	40	24	11	13	93	a8	debitage
s 301	Mousterian	chert	slight patination	none	_	absent	26	23	11	10	18	a21	single burin and opposed truncation
s 302	Mousterian	chert	none	scalar	bifacial	plain	39	25	15	15	13	a6	thick nosed end-scraper
s 303	flake with shouldered notch	flint	deep patination	none	_	absent	53	37	6	14 3	93	a31	debitage
s 304	radoir with faceted butt	flint	deep patination	sub-parallel	direct	convex facetted	48	37	12	2 4	8	a26	flake end-scraper
s 305	radoir pseudo-Mousterian	flint	deep patination	none	_	absent	22	39	9	9 1	93	a27	debitage
s 307	Mousterian	chert	none	scalar	direct	flat facetted	35	31	6	15	65	a12	piece with continuous retouch on one side
s 308	chert grattoir	?chert	none	sub-parallel	direct	absent	56	38	21	49 8	93	a19	debitage
s 308	Mousterian	flint	deep patination	scalar	direct	plain	26	40	19	27	93	a14	debitage
s 309	Mousterian	flint	deep patination	none	_	absent	32	31	12	12	93	a4	debitage
s 310	Mousterian	rhyolite	none	scalar & sub-parallel	direct	absent	27	24	8	9	14	a9	flat nosed end-scraper
s 311	Mousterian	chert	none	scalar	direct	absent	35	27	16	15	65	a13	piece with continuous retouch on one side
s 312	Mousterian	flint	deep patination	scalar	bifacial	plain	30	32	14	15	10	a10	thumbnail scraper
s 313	Mousterian	chert	none	none	_	absent	26	39	17	18	93	a23	debitage
s 315	grattoir Mosterian	flint	deep patination	scalar	direct	point only	34	23	7	6 7	65	a30	piece with continuous retouch on one side
s 316	Mousterian	rhyolite	none	scalar	bifacial	absent	25	30	14	17	93	a5	flake scraper
s 317*	flake	flint	slight patination	scalar	bifacial	absent	39	40	10	23 6	70	a28 d95 4	leaf point
s 318	flake	flint	deep patination	scalar	direct	plain	33	33	7	10 3	93	a25	debitage
s 319	nucleiform grattoir	chert	none	scalar	direct	absent	33	27	12	13 5	66	a35	piece with continuous retouch on both edges
s 319	oldest Aurignacian, nucleiform grattoir	flint	deep patination	scalar	direct	point only	28	33	18	19	8	a35	river gravel staining
s 320	implement	flint	deep patination	none	_	dihedral	37	38	12	18 7	93	a24	debitage
s 321	oldest Aurignacian, carinate grattoir	flint	deep patination	scalar	direct	absent	38	29	25	33	12	a32	atypical carinated end-scraper
s 322	oldest Aurignacian, carinate grattoir	flint	deep patination	sub-parallel	direct	absent	24	21	12	7	4	a33	ogival end-scraper
s 323	oldest Aurignacian, carinate grattoir	flint	slight patination	sub-parallel	direct	flat facetted	37	26	21	15	93	a34	debitage (trimming flake)
s 324	universal tool	flint	deep patination	none	_	point only	37	23	11	11 3	93	a29	debitage
s 325	implement	flint	deep patination	sub-parallel	direct	point only	34	25	14	11 4	13	_	thick nosed end-scraper
s 326	grattoir rectiligne	flint	deep patination	sub-parallel	direct	flat facetted	31	29	12	14	60	a60	straight truncation
s 327	grattoir rectiligne	flint	deep patination	abrupt	direct	absent	35	33	9	12	64	a56	double truncation (both concave)
s 328	grattoir rectiligne	flint	deep patination	scalar	direct	absent	30	26	8	10	64	a74 b6 7	double truncation (both concave)
s 329	grattoir rectiligne	flint	deep patination	sub-parallel	direct	absent	30	33	9	10	60	a53	straight truncation
s 330	grattoir rectiligne avec concave	flint	slight patination	sub-parallel	direct	absent	23	28	11	13	62	a73 b6 6	concave truncation
s 331	grattoir rectiligne	flint	deep patination	scalar	direct	dihedral	26	24	10	7	61	a94	oblique truncation
s 332	grattoir rectiligne	flint	deep patination	scalar	direct	dihedral	35	23	9	8	61	a58 b6 5	oblique truncation
s 333	grattoir rectiligne	flint	deep patination	scalar	direct	absent	36	8	7	5	60	a45	straight truncation
s 334*	ogival rostrate grattoir	rhyolite	none	scalar	direct	dihedral	47	30	17	23 3	13	a43 b6 11	thick nosed end-scraper
s 335*	ogival rostrate grattoir	rhyolite	none	sub-parallel	direct	absent	54	37	20	34 5	13	a36 b6 10 g27 8h	thick nosed end-scraper ("tang")
s 336	ogival rostrate grattoir	rhyolite	none	sub-parallel	direct	point only	40	26	34	66 1	13	a35	thick nosed end-scraper
s 337	ogival rostrate grattoir	rhyolite	none	sub-parallel	direct	absent	44	40	15	33 7	93	a42 d96 5	debitage
s 338	rostrate grattoir	flint	deep patination	none	_	point only	29	33	15	13 8	93	a71	debitage
s 339	rostrate grattoir	flint	deep patination	parallel	direct	point only	45	30	15	18 1	13	a40	thick nosed end-scraper
s 340	rostrate grattoir	flint	none	none	_	absent	35	34	15	26 4	93	a37	debitage
s 341	rostrate grattoir	flint	deep patination	sub-parallel	direct	absent	42	27	10	11 4	13	a38 b6 8	shouldered end-scraper
s 342	rostrate grattoir	flint	deep patination	s-l s s	direct	point only	34	22	13	6 7	61	a57	oblique truncation
s 343	rostrate grattoir	flint	deep patination	parallel	direct	absent	32	28	9	8 8	13	a41 b6 9	shouldered
s 344*	rostrate grattoir	flint	deep patination	sub-parallel	direct	flat facetted	43	18	11	9 9	17	a59	end-scraper-burin
s 345	terminal grattoir	flint	deep patination	sub-parallel	direct	absent	29	18	8	4 9	3	a62 b6 2	note "tang"
s 346	terminal grattoir	flint	deep patination	sub-parallel	direct	absent	45	26	12	3 2	2	a61	on trimming flake
s 347	grattoir sur bout de lame	flint	deep patination	scalar	bifacial	plain	82	19	7	16	6	a63 b6 1	end-scraper on Aurignacian blade
s 348	terminal grattoir	flint	deep patination	sub-parallel	direct	absent	35	25	8	7 6	2	a64	atypical end-scraper
s 349	terminal grattoir	flint	deep patination	scalar	direct	absent	40	17	10	7 2	17	a65 b6 3	end-scraper-burin
s 350	terminal grattoir	flint	deep patination	sub-parallel	direct	absent	34	20	5	3 2	2	a49 b6 4	atypical end-scraper
s 351	grattoir rectiligne	chert	none	sub-parallel	direct	plain	62	25	8	14	61	a55	oblique truncation
s 352	straight-notched grattoir	flint	deep patination	abrupt	direct	convex facetted	37	34	10	11 5	60	a52	straight truncation
s 353	straight-notched grattoir	flint	deep patination	sub-parallel	direct	absent	41	18	6	17	27	a47	dihedral straight burin
s 354	nucleus grattoir	flint	none	sub-parallel	direct	absent	25	32	24	21 4	11	a90	carinated end-scraper
s 356	rostrate grattoir	flint	deep patination	sub-parallel	inverse	dihedral	25	19	7	4 1	14	a39	flat nosed end-scraper
s 357	rostrate grattoir	flint	deep patination	sub-parallel	inverse	flat facetted	42	29	8	8 7	14	a48 b6 14	flat nosed end-scraper

OXFORD UNIVERSITY MUSEUM LIST BY ACCESSION NUMBER

ACC. NO.	PREV. CLASS.	MATERIAL	PATINATION	RETOUCH TYPE	R. POSITION	PLATFORM TYPE	L/mm	W/mm	Th/mm	W/g	TYPE	FIGURED	NEW CLASSIFICATION
s 359	round grattoir with opposed burin	flint	deep patination	sub-parallel	direct	absent	31	27	17	11 5	17	a89/89a	end-scraper
s 360	round grattoir with opposed burin	flint	deep patination	scalar	direct	absent	37	27	17	13 8	17	a87	end-scraper
s 361	grattoir court	flint	deep patination	scalar	direct	absent	48	38	12	27	8	a68 b6 13	flake end-scraper
s 362	grattoir court	flint	deep patination	scalar	direct	plain	27	37	8	8	10	a69	thumbnail end-scraper
s 363	grattoir court	flint	slight patination	s-l s s	direct	point only	25	26	6	5	10	a85 b7 1	thumbnail end-scraper
s 364	burin d'angle	flint	deep patination	abrupt	direct	absent	50	26	7	12	62	a86	concave truncation
s 365	burin busque a retouches laterales	flint	slight patination	sub-parallel	inverse	absent	44	8	8	8	32	a84	busqué burin
s 366	burin d'angle avec retouches transversales	flint	deep patination	scalar	direct	plain	40	25	7	6	34	a86	burin on oblique retouched truncation
s 367	grattoir sur bout de lame	flint	deep patination	s-l s s	direct	point only	72	40	13	34	77	a87 b7 7	side-scraper
s 368	beaked burin	flint	deep patination	none	_	absent	44	31	16	28 3	28	a81/81a	offset dihedral burin
s 369	_	flint	deep patination	sub-parallel	inverse	flat facetted	36	9	5	4	61	a 72 b7 8	oblique truncation
s 370	burin busque	chert	none	scalar	bifacial	point only	30	64	21	46	32	a80	busque burin
s 371	lateral burin	flint	deep patination	none	_	absent	36	32	13	3 2	13	a82	thick nosed end-scraper
s 372	lateral burin with opposing scraper	flint	deep patination	scalar	direct	absent	30	24	11	10 2	17	a46	end-scraper-burin
s 373*	lateral burin	flint	deep patination	scalar	direct	convex facetted	39	20	5	6 3	65	b7 9	piece with continuous retouch on one side
s 374*	lateral burin	flint	deep patination	sub-parallel	inverse	convex facetted	34	15	7	4 5	35	a51 b7 3	burin on oblique retouched truncation
s 375*	lateral burin	flint	deep patination	sub-parallel	direct	absent	33	28	4	7 2	35	a5- b7 2	burin on oblique retouched truncation
s 376	burin au bec de flute	flint	deep patination	scalar	direct	absent	44	22	9	11	17	a83/83a	end-scraper-burin
s 377	spatulate burin	flint	deep patination	sub-parallel	direct	plain	66	31	11	26	28	a77	offset dihedral burin
s 378	grattoir sur bout de lame	flint	deep patination	scalar	direct	dihedral	61	22	7	10	61	_	oblique truncation
s 379	middle Aurignacian burin au bec de flute	flint	deep patination	scalar	direct	flat facetted	53	19	8	8	27	a78 b7 4	dihedral straight burin
s 380	middle Aurignacian burin au bec de flute	flint	deep patination	scalar	direct	plain	72	28	8	15	27	a76	dihedral straight burin
s 381	middle Aurignacian burin au bec de flute	flint	deep patination	none	_	absent	35	15	4	1	27	a75	dihedral straight burin
s 382	middle Aurignacian burin au bec de flute	flint	deep patination	none	_	plain	54	21	8	9	27	a79	dihedral straight burin
s 383	squamous flake	flint	deep patination	none	_	absent	40	35	15	29	93	a111	debitage
s 384	squamous flake	flint	deep patination	none	_	absent	25	29	7	5 9	93	a113	debitage
s 385	squamous flake	flint	deep patination	none	_	absent	30	13	8	3 6	93	a112	debitage
s 386	squamous flake	flint	deep patination	none	_	absent	26	14	7	2 3	93	a114	debitage
s 387	squamous flake	flint	deep patination	none	_	absent	31	22	8	6 3	93	a116	debitage
s 388	upper Aurignacian	chert	none	scalar	direct	absent	40	31	7	14	93	a110	debitage
s 389	upper Aurignacian	rhyolite	none	scalar	direct	plain	60	18	5	7	65	a108 b8 5	piece with continuous retouch on one side
s 390	upper Aurignacian	chert	none	scalar	direct	convex facetted	45	14	4	3	24	a109 b8 6	alypical piercer
s 391	upper Aurignacian	rhyolite	none	none	_	plain	25	38	7	9	93	a107	debitage
s 392	(bec au courbe sur boule de lame)	rhyolite	none	scalar	direct	absent	41	21	11	13	64	a106	concave and oblique
s 393	upper Aurignacian	flint	deep patination	scalar	direct	plain	13	12	5	1	24	a100	alypical piercer
s 394	upper Aurignacian	flint	deep patination	abrupt	direct	plain	46	22	10	9	23	a103	piercer
s 396	upper Aurignacian (compared to Trilobite)	flint	deep patination	scalar	direct	absent	42	16	7	6	92	a102	blade narrowed by retouch
s 397	upper Aurignacian	flint	deep patination	s-l s s	direct	plain	32	18	7	3	93	a104	debitage
s 398	upper Aurignacian	flint	slight patination	none	_	absent	42	31	8	11	24	a105	alypical piercer
s 399	upper Aurignacian	flint	deep patination	abrupt	direct	convex facetted	49	12	5	3	95	a92 c175	single burin on partially retouched blade
s 400	upper Aurignacian	flint	deep patination	abrupt	direct	absent	47	14	5	4	65	a93 b8 8 c175 d133 11	piece with continuous retouch on one side
s 401	upper Aurignacian	flint	deep patination	abrupt	direct	absent	47	15	3	3	64	a94 b8 9 c175 g31 10b	alypical "Cheddar Point"
s 402	small flakes and borers	flint	deep patination	sub-parallel	direct	plain	35	6	3	0 7	93	_	debitage (burin spall)
s 403	small flakes and borers	flint	slight patination	none	_	absent	22	4	5	0 6	93	_	debitage (burin spall)
s 404	small flakes and borers	flint	slight patination	none	_	absent	23	15	4	1 3	93	_	debitage
s 405	small flakes and borers	flint	deep patination	none	_	plain	9	23	2	0 6	93	_	debitage
s 406	small flakes and borers	flint	deep patination	abrupt	direct	absent	18	4	1	0 1	93	_	debitage
s 407	small flakes and borers	flint	deep patination	abrupt	direct	absent	17	15	3	1 1	26	_	microlithic backed blade
s 408	small flakes and borers	flint	deep patination	scalar	direct	absent	21	13	7	1 9	65	_	piece with continuous retouch on one side (trimming flake)
s 409	small flakes and borers	flint	deep patination	none	_	absent	10	15	3	0 5	93	_	debitage
s 410	small flakes and borers	flint	deep patination	none	_	absent	9	7	2	0 2	93	_	debitage
s 412	small flakes and borers	flint	deep patination	none	_	absent	20	4	3	0 3	93	_	burin spall (broken and glued)
s 413	upper Aurignacian	flint	deep patination	abrupt	direct	convex facetted	39	11	4	1	58	a95 b8 7 c175 d133 13	totally backed blade
s 414	upper Aurignacian	flint	deep patination	abrupt	direct	absent	25	15	3	1	58	a96 c175	penknife point (broken)
s 415	upper Aurignacian	flint	deep patination	abrupt	direct	absent	26	10	2	1	58	a97 c175	totally backed blade
s 416	knife-like flake	flint	deep patination	sub-parallel	direct	absent	26	10	3	1 2	60	a98 c175	straight truncation
s 417	knife-like flake	flint	deep patination	scalar	_	absent	20	12	4	1 1	61	a99	oblique truncation
s 418	Proto-Solutrean (Font Robert Point au sol	flint	deep patination	abrupt	direct	plain	60	30	11	13	55	a116 b8 1 c275 d95 5 g27 8c	Font Robert Point (broken)
s 419	Proto-Solutrean	flint	none	s-l s s	direct	absent	73	30	4	34	65	a119 b8 1 c275	piece with continuous retouch on one side (trimming flake)
s 420	Proto-Solutrean	chert	none	scalar	bifacial	absent	80	28	7	25	69	a118/118a b8 2 c275 d95 1 g27 8a	leaf point
s 421	Proto-Solutrean	flint	deep patination	parallel	direct	absent	45	22	11	13	65	a120	piece with continuous retouch on one side
s 422	Proto-Solutrean	flint	none	scalar	direct	absent	52	15	10	10	65	a117	piece with continuous retouch on one side (trimming flake)
(cast) s 424	Proto-Solutrean	flint	none	scalar	direct	absent	60	18	10	CAST	69	a122 d94 1	leaf point
s 425	Proto-Solutrean	flint	deep patination	_	_	_	55	23	11	11	93	a121	trimming flake with invasive retouch
s 426	hammerstone	other	_	_	_	_	57	39	21	85	93	a mentioned page 352	hammerstone (of hornblende)
s 427	hammerstone	other	_	_	_	_	63	38	34	111	93	a photographed 18	hammerstone (of silicified breccia)
s 703	upper Aurignacian	flint	deep patination	scalar	direct	dihedral	30	28	6	6	93	_	debitage
4168	worked core	flint	none	none	_	absent	49	73	61	374 1	94	_	core

APPENDIX III Catalogue of Finds

OXFORD UNIVERSITY MUSEUM, LIST BY ACCESSION NUMBER

ACC. NO.	PREV. CLASS.	MATERIAL	PATINATION	RETOUCH TYPE	R. POSITION	PLATFORM TYPE	L/mm	W/mm	Th/mm	W/g.	TYPE	FIGURED	NEW CLASSIFICATION
5100	worked core	rhyolite	none	none	_	absent	114	520	400	270.6	94	_	core
5104	worked core	flint	none	none	_	absent	94	63	50	301.4	94	_	core
5106	worked core	chert	none	none	_	absent	60	50	40	130.6	94	_	core
5109	worked core	flint	none	none	_	absent	84	52	33	198.4	94	_	core (broken and glued)
8	_	flint	deep patination	scalar	direct	absent	69	19	5	9.2	93	_	debitage
15	_	rhyolite	none	scalar	inverse	absent	32	25	5	5.4	93	_	debitage
16	_	chert	deep patination	scalar	direct	dihedral	41	13	4	2.9	93	_	debitage
17	_	flint	deep patination	sub-parallel	direct	absent	11	18	3	0.8	93	_	debitage
18	_	flint	deep patination	scalar	direct	absent	37	26	8	8.1	93	_	debitage
19	_	flint	deep patination	abrupt	direct	absent	25	16	17	3.4	65	_	piece with continuous retouch on one edge
20	_	flint	deep patination	abrupt	direct	absent	25	15	3	2.1	85	_	backed bladelet
21	_	flint	none	none	_	absent	43	16	14	11.7	27	_	dihedral straight burin (fragment)
22	_	chert	deep patination	abrupt	direct	absent	35	23	5	6.8	93	_	debitage
23	_	flint	deep patination	scalar	_	absent	31	26	4	2.6	93	_	debitage
24	_	flint	none	abrupt	direct	absent	18	20	8	3.3	61	_	oblique truncation
25	_	chert	slight patination	sub-parallel	inverse	absent	27	19	7	4.4	93	_	debitage
26	_	flint	deep patination	abrupt	direct	absent	23	18	3	1.4	85	_	backed bladelet
27	_	flint	deep patination	none	_	absent	22	14	5	2.4	95	_	single burin
28	_	flint	deep patination	scalar	direct	absent	35	28	18	8.8	65	_	piece with continuous retouch on one edge
29	_	flint	deep patination	sub-parallel	direct	absent	33	17	8	3.9	2	_	atypical end-scraper
30	_	flint	deep patination	none	_	absent	32	21	10	7.9	95	_	single burin
31	_	flint	deep patination	scalar	direct	absent	30	11	4	2.4	65	_	piece with continuous retouch on one edge
32	_	flint	deep patination	abrupt	direct	absent	27	14	4	2	34	_	burin on straight retouched truncation
33	_	flint	deep patination	scalar	direct	plain	9	18	2	1	65	_	piece with continuous retouch on one edge
34	_	flint	deep patination	abrupt	inverse	absent	32	13	6	2.7	65	_	piece with continuous retouch on one edge
35*	_	flint	deep patination	sub-parallel	direct	absent	26	13	6	2.6	1	_	single end-scraper
36	_	flint	deep patination	scalar	direct	absent	13	15	6	0.9	65	_	piece with continuous retouch on one edge
37	_	flint	deep patination	none	_	plain	10	18	3	2.2	95	_	single burin
38	_	flint	deep patination	scalar	direct	point only	12	21	4	1.8	93	_	debitage
39	_	flint	deep patination	sub-parallel	direct	plain	18	20	7	2.9	93	_	debitage (trimming flake)
40	_	flint	deep patination	sub-parallel	direct	absent	10	18	5	2.1	93	_	debitage
41	_	flint	deep patination	abrupt	direct	absent	18	25	9	5.8	66	_	piece with continuous retouch on both edges
42	_	flint	deep patination	scalar	direct	absent	15	14	5	2	93	_	debitage
43	_	flint	deep patination	scalar	direct	point only	30	25	9	7	65	_	piece with continuous retouch on one edge
44	_	flint	deep patination	none	_	absent	25	21	5	3.8	95	_	single burin
45	_	flint	deep patination	sub-parallel	direct	plain	39	20	12	9.3	27	_	dihedral straight burin

THE ASHMOLEAN MUSEUM, OXFORD: LIST BY ACCESSION NUMBER

ACC. NO.	PREV. CLASS.	MATERIAL	PATINATION	RETOUCH TYPE	R. POSITION	PLATFORM	L/mm	W/mm	Th/mm	W/g.	TYPE	NEW CLASSIFICATION
1968.1683	side scraper	flint	deep patination	none	none	plain	29	24	4	5.2	93	debitage
1968.1684	side scraper	flint	deep patination	scalar	direct	plain	59	28	6	10.9	65	piece with continuous retouch on one edge
1968.1685	side scraper	flint	deep patination	s-l s s	direct	absent	29	15	7	3.8	65	piece with continuous retouch on one edge (trimming flake)
1968.1689	horse shoe scraper	flint	deep patination	scalar	direct	plain	22	26	7	10.4	2	atypical end-scraper
1968.1690	end scraper	flint	slight patination	none	none	plain	32	21	8	7.4	93	debitage (blade)
1968.1691	end scraper	flint	deep patination	none	none	absent	34	21	4	4.9	93	debitage
1968.1692	end scraper	flint	deep patination	abrupt	none	absent	34	21	3	4.2	14	flat nosed end-scraper
1968.1693	rostrate scraper	flint	deep patination	none	none	absent	21	21	7	6.2	93	debitage
1968.1694	rostrate scraper	flint	deep patination	sub-parallel	direct	absent	15	16	5	1.7	13	thick nosed end-scraper (river gravel staining)
1968.1695	rostrate scraper	flint	deep patination	none	none	absent	18	14	8	2.1	93	debitage
1968.1696	rostrate scraper	flint	deep patination	sub-parallel	direct	absent	22	20	9	3.5	14	flat nosed end-scraper
1968.1703	rostrate scraper	flint	deep patination	sub-parallel	direct	absent	14	7	6	1.1	12	atypical carinated end-scraper
1968.1708	rostrate scraper	flint	deep patination	none	none	absent	24	27	11	5.4	93	debitage (core remnant)
1968.1711	graver	flint	deep patination	none	none	absent	23	18	3	3	27	dihedral straight burin
1968.1713	graver	flint	deep patination	scalar	direct	absent	46	14	9	7.6	32	busque burin
1968.1714	graver	flint	deep patination	none	none	absent	23	22	10	5.7	93	debitage (trimming flake)
1968.1716	graver	flint	deep patination	scalar	direct	plain	34	22	6	7.2	65	piece with continuous retouch on one edge
1968.1717	graver	flint	deep patination	none	none	absent	37	22	26	10.7	28	offset dihedral burin
1968.1718	graver spall	flint	deep patination	none	none	absent	37	4	3	0.6	93	debitage (burin spall)
1968.1719	serrated flake	flint	deep patination	none	none	point only	20	16	5	2.3	93	debitage (river gravel staining)
1968.1721	core (s)	flint	deep patination	none	none	absent	66	24	43	118.7	15	core-like end-scraper
1968.1723	scraper	rhyolite	slight patination	none	none	plain	34	31	7	9.6	93	debitage
1968.1724	scraper	rhyolite	none	none	none	absent	27	25	7	5.7	93	debitage
1968.1726	end scraper	rhyolite	none	scalar	direct	absent	52	29	18	18.7	2	atypical end-scraper
1968.1727	rostrate scraper	chert	none	?abrupt	?inverse	absent	26	6	10	6.6	93	debitage
1968.1730	rostrate scraper	rhyolite	none	none	none	absent	39	37	10	16.9	93	debitage (possible nosed corner)
1968.1732	rostrate scraper	chert	slight patination	none	none	absent	21	17	9	4.6	93	debitage
1968.1733	rostrate scraper	chert	none	sub-parallel	direct	absent	14	11	10	3.2	14	flat nosed end-scraper
1968.1734	graver (s)	rhyolite	none	denticulate	inverse	plain	53	28	11	19.8	35	burin on oblique retouched truncation
1968.1736	core	rhyolite	slight patination	none	none	absent	50	25	35	75.4	94	core

APPENDIX V: Catalogue of Finds.

SWANSEA MUSEUM: LIST BY ACCESSION NUMBER.

ACC. NO.	PREV. CLASS.	MATERIAL	PATINATION	RETOUCH TYPE	R. POSITION	PLATFORM TYPE	L/mm	W/mm	Th/mm	W/g.	TYPE	CLASSIFICATION
A909.1.8	–	flint	deep patination	none	–	point only	6	35	5	18	93	debitage
A909.1.10	–	flint	deep patination	scalar	direct	point only	–	–	–	–	1	single end-scraper
A909.1.11	–	flint	deep patination	none	–	flat facetted	55	25	10	12	93	debitage
A909.1.20	–	rhyolite	none	none	–	plain	55	20	5	10	93	debitage
A909.1.25	–	flint	deep patination	none	–	point only	45	23	3	2	93	debitage
A909.1.26	–	flint	deep patination	none	–	flat facetted	53	20	17	8	93	debitage
A909.1.27	–	flint	slight patination	none	–	absent	15	42	6	4	93	debitage
A909.1.30	–	flint	deep patination	none	–	point only	40	15	2	1	93	debitage
A909.1.33	–	flint	deep patination	abrupt	inverse	absent	31	13	3	1	65	debitage
A909.1.34	–	flint	deep patination	none	–	absent	40	14	2	1	93	debitage
A909.1.37	–	flint	slight patination	none	–	dihedral	125	28	5	152	93	debitage (L.U.P.)
A909.1.38	–	chert	none	none	–	dihedral	123	33	39	204	93	debitage (large trimming flake)
A909.1.39	fine grained black chert	chert	none	none	–	plain	60	35	7	14	93	debitage
A909.1.40	–	flint	deep patination	none	–	absent	50	22	7	6	93	debitage
A909.1.41	grattoir rectiligne	flint	deep patination	sub-parallel	direct	absent	35	29	4	10	1	single end-scraper
A909.1.42	–	flint	deep patination	none	–	point only	55	25	8	10	93	debitage
A909.1.44	greensand chert	chert	none	none	–	point only	56	23	3	8	93	debitage
A909.1.45	–	chert	none	scalar	direct	point only	46	30	10	14	93	debitage
A909.1.49	–	other	slight patination	none	–	absent	35	42	10	18	93	debitage
A909.1.50	–	flint	deep patination	none	–	flat facetted	32	41	7	12	93	debitage
A909.1.51	–	flint	deep patination	none	–	plain	56	31	10	32	93	debitage
A909.1.52	–	flint	deep patination	none	–	convex facetted	52	27	4	4	93	debitage
A909.1.53	–	flint	deep patination	none	–	dihedral	63	46	12	54	93	debitage (core rejuvination flake)
A909.1.54	–	flint	deep patination	none	–	absent	59	19	9	8	93	debitage
A909.1.55	–	flint	slight patination	none	–	absent	51	23	9	10	93	debitage
A909.1.56	–	flint	deep patination	none	–	flat facetted	39	45	9	27	93	debitage
A909.1.57	–	chert	none	none	–	plain	50	17	12	8	93	debitage
A909.1.58	–	flint	deep patination	none	–	absent	20	23	8	2	93	debitage
A909.1.59	–	flint	deep patination	none	–	absent	29	19	10	4	93	debitage
A909.1.61	–	flint	deep patination	none	direct	point only	54	27	16	39	93	debitage (core rejuvination flake)
A909.1.62	–	flint	deep patination	scalar	–	plain	17	42	5	3	93	debitage
A909.1.63	–	flint	deep patination	none	direct	plain	27	18	7	4	93	debitage
A909.1.65	–	flint	deep patination	none	–	point only	32	21	4	8	93	debitage
A909.1.67	–	rhyolite	none	none	–	plain	43	36	6	16	93	debitage
A909.1.68	–	flint	slight patination	none	–	dihedral	19	62	9	17	93	debitage (possible starch fracture)
A909.1.69	–	flint	deep patination	abrupt	direct	absent	37	15	8	7	93	debitage (core trimming flake)
A909.1.76	–	flint	deep patination	none	–	point only	50	29	5	10	93	debitage
A909.1.77	–	flint	deep patination	none	–	absent	27	6	3	1	93	debitage
A909.1.78	–	flint	slight patination	abrupt	inverse	absent	35	12	5	3	61	oblique truncation
A909.1.79	–	flint	deep patination	none	–	convex facetted	28	20	3	5	93	debitage (core rejuvination flake)
A909.1.80	–	flint	deep patination	none	–	absent	33	19	3	2	107	simple burin
A909.1.81	–	flint	deep patination	none	–	plain	22	30	2	1	93	debitage (thinning flake)
A909.1.84	–	flint	deep patination	none	–	plain	30	31	2	2	93	debitage
A909.1.87	–	flint	deep patination	none	–	dihedral	8	38	6	7	93	debitage
A909.1.88	–	flint	deep patination	none	–	convex facetted	31	22	5	2	93	debitage
A909.1.89	–	flint	deep patination	none	–	plain	35	22	7	9	93	debitage
A909.1.90	–	flint	deep patination	none	–	point only	33	34	7	23	93	debitage
A909.1.91	–	flint	deep patination	none	–	plain	30	28	2	2	93	debitage
A909.1.93	–	flint	deep patination	none	–	absent	26	19	6	3	93	debitage
A909.1.94	–	flint	deep patination	none	–	flat facetted	17	28	4	2	93	debitage (thinning flake)
A909.1.95	–	flint	deep patination	none	–	absent	16	8	3	1	93	debitage

APPENDIX V: Catalogue of Finds.

SWANSEA MUSEUM: LIST BY ACCESSION NUMBER

ACC. NO.	PREV. CLASS.	MATERIAL	PATINATION	RETOUCH TYPE	R. POSITION	PLATFORM TYPE	L/mm	W/mm	Th/mm	W/g.	TYPE	CLASSIFICATION
A909.1.96	_	flint	deep patination	none	_	absent	39	15	4	3	93	debitage
A909.1.97	_	flint	deep patination	sub-parallel	direct	absent	28	27	6	3	93	debitage
A909.1.98	_	flint	deep patination	none	_	plain	37	19	8	9	93	debitage (core fragment)
A909.1.99	_	flint	deep patination	none	_	absent	30	29	6	1	93	debitage
A909.1.104	_	rhyolite	none	none	_	absent	32	17	4	2	93	debitage
A909.1.105	_	flint	deep patination	none	_	plain	22	21	6	3	93	debitage
A909.1.107	_	flint	deep patination	none	_	absent	12	18	8	1	93	debitage
A909.1.108	_	flint	deep patination	none	_	flat facetted	33	30	7	11	93	debitage
A909.1.110a	_	flint	deep patination	none	_	absent	34	14	6	2	93	debitage
A909.1.110b	_	flint	deep patination	none	_	dihedral	44	20	15	19	93	debitage
A909.1.111	_	flint	deep patination	none	_	absent	40	24	14	11	93	debitage
A909.1.112	_	flint	deep patination	none	_	plain	45	32	14	20	93	debitage
A909.1.117	_	chert	none	scalar	direct	absent	28	22	4	3	93	debitage
A909.1.118	_	flint	deep patination	none	_	plain	32	15	5	2	93	debitage (yellow/ orange colouration)
A909.1.119	_	flint	deep patination	none	_	absent	33	13	4	2	93	debitage
A909.1.120	_	flint	deep patination	none	_	absent	13	13	3	<1	93	debitage
A909.1.122	_	chert	deep patination	none	_	absent	33	2	7	<1	93	debitage
836.1.16	blade end-scraper	flint	deep patination	scalar	direct	point only	_	_	_	_	5	end-scraper on retouched blade
836.1.22	round scraper with opposed point	flint	deep patination	scalar	direct	point only	_	_	_	_	17	end-scraper-burin (b59:4)
"7" on piece	_	flint	deep patination	abrupt	direct	absent	_	_	_	_	61	oblique truncation
"9" on piece	_	flint	deep patination	abrupt	direct	absent	_	_	_	_	62	concave truncation
"Pavisland Dec 1914"	_	chert	none	none	_	point only	_	_	_	_	93	bifacially retouched piece/disc core

APPENDIX VI: Catalogue of Finds.

BRITISH MUSEUM: LIST BY ACCESSION NUMBER.

ACC. NO.	PREV. CLASS.	MATERIAL	PATINATION	RETOUCH TYPE	R. POSITION	PLATFORM TYPE	L/mm	W/mm	Th/mm	W/g.	TYPE	CLASSIFICATION
1946 7-1:2	chert flake narrow	chert	slight patination	none	_	plain	61	16	5	10.8	93	debitage (hard beige sediment dorsal side)
1946 7-1:3	flint flake narrow	flint	deep patination	none	_	flat facetted	72	18	9	10.3	93	debitage
1946 7-1:4	flint flake lanceolate	flint	deep patination	scalar	direct	plain	75	28	6	10	93	debitage (hard beige sediment dorsal side)
1946 7-1:5	flint flake triangular	flint	deep patination	none	_	convex facetted	48	30	13	13.8	93	debitage (hard beige sediment dorsal side and cortex)
1916 6-5:108	flint flake	flint	slight patination	none	_	plain	74	24	7	11.4	93	debitage
1916 6-5:109	flint flake	other	slight patination	none	_	point only	54	25	6	10.1	93	debitage
1916 6-5:110	flint flake	flint	deep patination	none	_	flat facetted	63	20	8	12.8	93	debitage (rejuvination flake)
1916 6-5:111	flint flake	flint	slight patination	none	_	flat facetted	40	24	3	5.9	93	debitage
1916 6-5:112	flint flake	flint	slight patination	none	_	absent	42	14	3	3.3	93	debitage (retouched point)
1916 6-5:113	flint flake	flint	deep patination	none	_	absent	40	18	7	5.4	93	debitage
1916 6-5:114	flint splinter	flint	deep patination	none	_	flat facetted	44	5	4	1.6	93	debitage (large burin spall or bladelet)
1916 6-5:115	slatelike stone flake	chert	none	scalar	direct	plain	58	29	8	22.6	65	piece with continuous retouch on one side
1916 6-5:116	slatelike stone flake	chert	none	none	_	plain	43	31	5	10.8	93	debitage
1916 6-5:117	slatelike stone flake	chert	none	sub-parallel	inverse	convex facetted	46	23	7	10	14	flat nosed end-scraper
1916 6-5:118	slatelike stone flake	chert	none	scalar	direct	absent	43	26	4	6.3	65	piece with continuous retouch on one side
1916 6-5:119	slatelike stone flake	flint	none	none	_	point only	45	22	5	9.2	93	debitage (red staining)

APPENDIX VII: Catalogue of Finds.

THE MANCHESTER MUSEUM: LIST BY ACCESSION NUMBER.

ACC. NO.	PREV. CLASS.	MATERIAL	PATINATION	RETOUCH TYPE	R. POSITION	PLATFORM TYPE	L/mm	W/mm	Th/mm	W/g.	TYPE	CLASSIFICATION
2879 (a)	_	flint	deep	none	_	plain	54	37	9	_	93	debitage
2879 (b)	_	flint	deep	none	_	absent	37	22	6	_	93	debitage
2879 (c)	_	flint	deep	sub-parallel	direct	plain	40	32	9	_	8	flake endscraper
2879 (d)	_	flint	deep	scalar	direct	absent	49	28	10	_	65	piece with continuous retouch on one side

APPENDIX VIII Catalogue of Finds

ALL COLLECTIONS: LIST BY TOOL TYPE

TYPE	CLASSIFICATION	MATERIAL	PATINATION	RETOUCH TYPE	R. POSITION	PLATFORM TYPE	L/mm	W/mm	Th/mm	W/g	ACC. NO.
1	single end-scraper	flint	deep patination	sub-parallel	direct	absent	26	13	6	2 6	debitage 35*
1	single end-scraper	flint	slight patination	scalar	direct	point only	37	22	8	7 8	15 277/8g
1	single endscraper	flint	slight patination	scalar	inverse	point only	53	27	6	11	15 277/8l
1	single end-scraper (on core trimming flake)	flint	deep patination	scalar	direct	absent	35	22	13	12 4	24 94/155
1	single end-scraper	flint	burnt	scalar & sub-parallel	direct	absent	29	29	10	12 3	24 94/210
1	single end-scraper	flint	deep patination	none	_	flat facetted	56	39	7	5 9	50 406/10
1	single end-scraper	flint	slight patination	none	_	point only	31	34	7	19 6	50 406/6
1	single end-scraper	flint	deep patination	scalar	direct	point only	_	_	_	_	A909 1 10
1	single end-scraper	flint	deep patination	sub-parallel	direct	absent	35	29	4	10	A909 1 41
2	atypical end-scraper	chert	none	sub-parallel	direct	flat facetted	25	25	9	5 2	24 94/158
2	atypical end-scraper	chert	none	sub-parallel	direct	absent	21	16	9	11 5	34 588/12
2	atypical end-scraper	chert	none	sub-parallel	inverse	absent	52	28	7	1 3	34 568/4
2	atypical end-scraper	flint	deep patination	sub-parallel	direct	absent	33	17	8	3 9	debitage 29
2	atypical end-scraper	flint	deep patination	scalar	direct	plain	22	26	7	10 4	1968 1689
2	atypical end-scraper	flint	slight patination	sub-parallel	inverse	flat facetted	31	15	6	3 1	24 94/127
2	atypical end-scraper	flint	deep patination	sub-parallel	direct	absent	44	30	5	6 7	24 94/149
2	atypical end-scraper	flint	deep patination	sub-parallel	direct	absent	36	16	8	4 4	24 94/160
2	atypical end-scraper	flint	deep patination	scalar	direct	absent	20	24	6	4 6	24 94/163
2	atypical end-scraper	flint	deep patination	scalar	direct	plain	50	24	11	17 9	24 94/164b
2	atypical end-scraper	flint	deep patination	abrupt	direct	flat facetted	34	19	7	5 7	24 94/186
2	atypical end-scraper	flint	deep patination	abrupt	inverse	absent	22	17	7	3 5	24 94/188
2	atypical end-scraper	flint	deep patination	sub-parallel	direct	absent	33	20	13	12 8	24 94/19c
2	atypical end-scraper (microlithic)	flint	deep patination	abrupt	direct	absent	24	22	4	0 7	24 94/255a
2	atypical end-scraper	flint	deep patination	scalar	direct	absent	35	20	6	2 7	24 94/355 173
2	atypical end-scraper	flint	deep patination	scalar	direct	plain	38	28	16	17 7	24 94/99b
2	atypical end-scraper	flint	deep patination	sub-parallel	direct	plain	42	28	10	0 7	50 406/7
2	atypical end-scraper on trimming flake	flint	deep patination	sub-parallel	direct	absent	45	26	12	3 2	s 346
2	atypical end-scraper	flint	deep patination	sub-parallel	direct	absent	35	25	8	7 6	s 348
2	atypical end-scraper	flint	deep patination	sub-parallel	direct	absent	34	20	5	3 2	s 350
2	atypical end-scraper	flint	deep patination	sub-parallel	inverse	dihedral	39	31	11	14	s 358
2	atypical end-scraper	rhyolite	none	scalar	direct	absent	52	29	18	18 7	1968 1726
2	atypical end-scraper (note "tang")	flint	deep patination	sub-parallel	direct	absent	29	18	8	4 9	s 345
4	ogival end-scraper	chert	none	scalar	direct	plain	22	19	9	7	24 94/228
4	ogival end-scraper (atypical)	chert	none	scalar	direct	flat facetted	27	18	7	6 9	24 94/230
4	ogival end-scraper (atypical)	chert	none	scalar	bifacial	dihedral	25	15	7	3 7	24 94/231
4	ogival end-scraper	flint	deep patination	sub-parallel	direct	absent	24	21	12	7	s 322
4	ogival end-scraper	other	none	scalar	direct	absent	27	35	9	8 5	50 406/23 5
4	ogival end-scraper	rhyolite	none	sub-parallel	direct	dihedral	31	19	8	8	24 94/227
4	ogival end-scraper	rhyolite	none	sub-parallel	direct	absent	48	19	7	3 8	50 406/11*
5	end-scraper on retouched blank	chert	none	abrupt	bifacial	absent	32	22	7	8 4	24 94/153
5	end-scraper on retouched blank	flint	deep patination	sub-parallel	direct	dihedral	29	23	8	7 6	24 94/150
5	endscraper on retouched blank (atypical)	flint	deep patination	scalar & sub-parallel	_	absent	25	11	5	1 7	24 94/355 152
5	end-scraper on retouched blank	flint	deep patination	parallel	bifacial	absent	32	13	5	2 5	24 94/87
5	end-scraper on retouched blade	flint	deep patination	scalar	direct	point only	_	_	_	_	836 1 16
5	end-scraper on retouched blank	rhyolite	none	scalar	inverse	plain	40	19	9	9 7	24 94/141
6	end-scraper on Aurignacian blade	flint	deep patination	scalar	bifacial	plain	82	19	7	16	s 347
8	flake end-scraper	chert	none	scalar	direct	absent	36	35	10	12 6	24 94/223
8	flake end-scraper	chert	none	none	_	dihedral	28	24	8	6 7	24 94/225
8	flake end-scraper (atypical)	chert	none	scalar	direct	plain	23	22	9	7 4	24 94/243
8	flake end-scraper (atypical)	chert	none	scalar	direct	plain	27	26	13	12 5	24 94/244
8	flake end-scraper	chert	none	scalar	inverse	dihedral	26	25	13	10 6	24 94/245
8	flake end-scraper	chert	none	scalar	direct	plain	31	29	9	16	s 290
8	flake end-scraper	flint	deep patination	sub-parallel	direct	absent	29	20	4	3 2	24 94/156
8	flake end-scraper (broken)	flint	deep patination	scalar	direct	flat facetted	25	23	9	4 1	24 94/157
8	flake end-scraper	flint	deep patination	abrupt	direct	plain	31	23	8	5 4	24 94/169
8	flake end-scraper	flint	deep patination	abrupt	direct	absent	17	26	7	3	24 94/170
8	flake end-scraper	flint	deep patination	scalar	direct	absent	23	28	12	9 1	24 94/211

APPENDIX VIII Catalogue of Finds

ALL COLLECTIONS LIST BY TOOL TYPE

TYPE	CLASSIFICATION	MATERIAL	PATINATION	RETOUCH TYPE	R. POSITION	PLATFORM TYPE	L/mm	W/mm	Th/mm	W/g	ACC. NO.
8	flake end-scraper (broken and glued)	flint	deep patination	scalar	direct	plain	33	29	10	10 4	24 94/212
8	flake end-scraper	flint	deep patination	abrupt	direct	dihedral	21	19	7	6 6	24 94/214
8	flake end-scraper	flint	deep patination	scalar	direct	absent	29	28	18	7 2	24 94/215
8	flake end-scraper	flint	deep patination	abrupt	inverse	absent	26	25	5	3 3	24 94/216
8	flake end-scraper (atypical)	flint	deep patination	scalar	direct	plain	43	34	20	29	24 94/220
8	flake end-scraper (atypical)	flint	deep patination	scalar	direct	plain	35	34	8	17	24 94/222
8	flake end-scraper	flint	deep patination	abrupt	direct	plain	31	24	7	7 4	24 94/226
8	flake end-scraper	flint	deep patination	scalar	direct	dihedral	26	39	12	9 8	24 94/297
8	flake end-scraper	flint	slight patination	sub-parallel	inverse	plain	30	29	9	3 7	34 568/2
8	flake end-scraper	flint	deep patination	scalar	direct	dihedral	31	31	14	18	s 291
8	flake end-scraper	flint	deep patination	sub-parallel	direct	convex facetted	48	37	12	2 4	s 304
8	river gravel staining	flint	deep patination	scalar	direct	point only	28	33	18	19	s 319
8	flake end-scraper	flint	deep patination	scalar	direct	absent	48	38	12	27	s 361
8	flake end-scraper (atypical)	rhyolite	none	scalar	bifacial	absent	30	18	18	30 3	24 94/254
10	thumb-nail end-scraper	flint	deep patination	scalar	direct	absent	21	22	11	5 7	24 94/162
10	thumbnail scraper	flint	deep patination	scalar	bifacial	plain	30	32	14	15	s 312
10	thumbnail end-scraper	flint	deep patination	scalar	direct	plain	27	37	8	8	s 362
10	thumbnail end-scraper	flint	slight patination	s-l s s	direct	point only	25	26	6	5	s 363
10	thumbnail scraper	rhyolite	none	scalar & sub-parallel	direct	dihedral	20	21	9	6 1	24 94/233
11	carinated end-scraper	flint	none	sub-parallel	direct	absent	25	32	24	21 4	s 354
12	atypical carinated end-scraper	flint	deep patination	sub-parallel	direct	absent	14	7	6	1 1	1968 1703
12	atypical carinated end-scraper	flint	deep patination	sub-parallel	direct	dihedral	17	31	20	6 7	60 96/3
12	atypical carinated end-scraper	flint	deep patination	scalar	direct	absent	38	29	25	33	s 321
13	thick nosed end-scraper (atypical)	chert	none	sub-parallel	direct	absent	27	22	15	12	24 94/19b
13	thick nosed end-scraper	chert	none	scalar	bifacial	plain	39	25	15	15	s 302
13	thick nosed end-scraper (river gravel staining)	flint	deep patination	sub-parallel	direct	absent	15	16	5	1 7	1968 1694
13	thick nosed end-scraper (atypical)	flint	deep patination	sub-parallel	direct	plain	23	14	10	4 2	24 94/ 1
13	thick nosed end-scraper	flint	deep patination	none	direct	plain	8	12	5	1 5	24 94/168
13	single end-scraper	flint	deep patination	none	_	flat facetted	28	15	7	13 3	50 406/4
13	thick nosed end-scraper	flint	deep patination	sub-parallel	direct	point only	34	25	14	11 4	s 325
13	thick nosed end-scraper	flint	deep patination	parallel	direct	point only	45	30	15	18 1	s 339
13	shouldered end-scraper	flint	deep patination	sub-parallel	direct	absent	42	27	10	11 4	s 341
13	shouldered	flint	deep patination	parallel	direct	absent	32	28	9	8 8	s 343
13	thick nosed end-scraper	flint	deep patination	none	_	absent	36	32	13	3 2	s 371
13	thick nosed end-scraper	rhyolite	none	s-l s s	direct	absent	55	38	21	17 5	78 47 h/8
13	thick nosed end-scraper	rhyolite	none	scalar	direct	dihedral	47	30	17	23 3	s 334*
13	thick nosed end-scraper ("tang")	rhyolite	none	sub-parallel	direct	absent	54	37	20	34 5	s 335*
13	thick nosed end-scraper	rhyolite	none	sub-parallel	direct	point only	40	28	34	66 1	s 336
14	flat nosed end-scraper	chert	none	sub-parallel	direct	absent	14	11	10	3 2	1968 1733
14	flat nosed end-scraper	chert	none	sub-parallel	inverse	convex facetted	46	23	7	10	1916 6-5 117
14	flat nosed end-scraper	chert	none	sub-parallel	inverse	flat facetted	49	26	8	1 8	24 94/139
14	flat nosed end-scraper	chert	none	scalar & sub-parallel	inverse	plain	37	26	6	5 9	24 94/140
14	shouldered end-scraper	chert	none	sub-parallel	direct	flat facetted	25	20	7	4 3	24 94/17a
14	flat nosed end-scraper	chert	none	sub-parallel	inverse	point only	24	35	6	6 4	24 94/218
14	shouldered end-scraper	chert	none	abrupt	inverse	dihedral	34	37	14	6 2	24 94/260
14	flat nosed end-scraper	chert	none	scalar	direct	flat facetted	49	31	17	27	s 293
14	flat nosed end-scraper	flint	deep patination	abrupt	none	absent	34	21	3	4 2	1968 1692
14	flat nosed end-scraper	flint	deep patination	sub-parallel	direct	absent	22	20	9	3 5	1968 1696
14	flat nosed end-scraper	flint	deep patination	sub-parallel	inverse	plain	40	25	8	7 8	24 94/145*
14	flat nosed end-scraper	flint	deep patination	sub-parallel	inverse	flat facetted	34	24	17	6 7	24 94/146*
14	shouldered end-scraper	flint	none	sub-parallel	direct	flat facetted	35	9	11	7 5	24 94/193b
14	flat nosed end-scraper	flint	deep patination	scalar	direct	dihedral	40	37	17	24 4	24 94/221
14	flat nosed end-scraper	flint	deep patination	scalar & sub-parallel	direct	absent	32	28	12	10 5	24 94/264
14	shouldered end-scraper	flint	deep patination	sub-parallel	direct	absent	29	18	11	6 7	24 94/266
14	nosed end-scraper	flint	deep patination	sub-parallel	direct	point only	32	31	9	16 9	24 94/268
14	flat nosed end-scraper	flint	deep patination	sub-parallel	direct	absent	54	21	9	9	24 94/270
14	shouldered end-scraper	flint	deep patination	sub-parallel	inverse	flat-facetted	22	29	7	7	24 94/355 140

APPENDIX VIII: Catalogue of Finds

ALL COLLECTIONS: LIST BY TOOL TYPE.

TYPE	CLASSIFICATION	MATERIAL	PATINATION	RETOUCH TYPE	R. POSITION	PLATFORM TYPE	L/mm	W/mm	Th/mm	W/g	ACC. NO.
14	single end-scraper	flint	deep patination	sub-parallel	direct	flat facetted	41	26	8	5 4	50 406/12a
14	flat nosed endscraper	flint	deep patination	sub-parallel	inverse	plain	39	25	10	0 3	60 96/7 63
14	flat nosed end-scraper	flint	deep patination	sub-parallel	inverse	dihedral '	25	19	7	4 1	s 356
14	flat nosed end-scraper	flint	deep patination	sub-parallel	inverse	flat facetted	42	29	8	8 7	s 357
14	shouldered end-scraper	rhyolite	none	sub-parallel	direct	absent	32	47	13	23 4	24 94/262
14	flat nosed end-scraper	rhyolite	none	scalar	direct	absent	29	24	11	12 7	24 94/265
14	flat nosed end-scraper	rhyolite	none	scalar & sub-parallel	direct	absent	27	24	8	9	s 310
15	core-like end-scraper	flint	deep patination	none	none	absent	66	24	43	118 7	1968 1721
17	end-scraper - burin	flint	deep patination	sub-parallel	inverse	absent	34	17	6	3	24 94/147b
17	end-scraper - burin	flint	deep patination	sub-parallel	direct	absent	25	21	7	7 1	24 94/246a
17	end-scraper-burin	flint	deep patination	abrupt	direct	absent	56	19	5	7	24 94/35b*
17	end-scraper - burin	flint	deep patination	scalar	direct	plain	31	35	13	13 2	24 94/76
17	end-scraper - burin	flint	deep patination	sub-parallel	direct	plain	33	19	5	3 8	24 94/84
17	end-scraper - burin	flint	deep patination	scalar	direct	absent	40	30	7	7 8	24 94/94
17	end-scraper - burin	flint	slight patination	s-l s s	direct	absent	31	32	13	12 1	24 94/95
17	end-scraper - burin	flint	deep patination	sub-parallel & s-l s s	direct	absent	35	31	18	18 9	24 94/96
17	end-scraper - burin	flint	deep patination	sub-parallel	direct	absent	7	22	9	7 7	34 568/14
17	end-scraper - burin (b59 4)	flint	deep patination	scalar	direct	point only	_	_	_	_	836 1 22
17	end-scraper-burin	flint	deep patination	sub-parallel	direct	flat facetted	43	18	11	9 9	s 344*
17	end-scraper-burin	flint	deep patination	scalar	direct	absent	40	17	10	7 2	s 349
17	end-scraper	flint	deep patination	sub-parallel	direct	absent	31	27	17	11 5	s 359
17	end-scraper	flint	deep patination	scalar	direct	absent	37	27	17	13 8	s 360
17	end-scraper-burin	flint	deep patination	scalar	direct	absent	30	24	11	10 2	s 372
17	end-scraper-burin	flint	deep patination	scalar	direct	absent	44	22	9	11	s 378
18	single burin and opposed truncation	chert	slight patination	none	_	absent	26	23	11	10	s 301
19	burin- truncated blade	flint	slight patination	abrupt	inverse	absent	50	15	6	5 7	15 277/8b
23	piercer	chert	none	abrupt	direct	plain	30	24	10	9 2	24 94/26b
23	piercer	chert	deep patination	abrupt	inverse	plain	32	36	9	17 5	24 94/305
23	piercer	flint	deep patination	abrupt	direct	plain	34	18	6	4 1	24 94/194
23	piercer	flint	deep patination	abrupt	inverse	absent	24	13	3	1 6	24 94/27b
23	notched piece	flint	deep patination	scalar	direct	plain	31	26	8	7 3	24 94/309
23	piercer	flint	deep patination	abrupt	inverse	plain	8	6	4	16 1	34 568/17
23	piercer	flint	deep patination	abrupt	direct	plain	29	20	4	9	34 568/18
23	piercer	flint	deep patination	abrupt	direct	plain	46	22	10	9	s 394
24	atypical piercer	chert	none	scalar	direct	convex facetted	45	14	4	3	s 390
24	atypical piercer	flint	deep patination	scalar	direct	plain	13	12	5	1	s 393
24	atypical piercer	flint	slight patination	none	_	absent	42	31	8	11	s 398
26	microlithic backed blade	flint	deep patination	abrupt	direct	absent	17	15	3	1 1	s 407
27	dihedral straight burin (fragment)	flint	none	none	_	absent	43	16	14	11 7	debitage 21
27	dihedral straight burin	flint	deep patination	sub-parallel	direct	plain	39	20	12	9 3	debitage 45
27	dihedral straight burin	flint	deep patination	none	none	absent	23	18	3	3	1968 1711
27	dihedral straight burin	flint	slight patination	none	_	absent	32	20	7	4 2	24 94/102
27	dihedral straight burin	flint	deep patination	scalar	direct	dihedral	42	17	5	4 6	24 94/104
27	dihedral straight burin	flint	deep patination	none	_	plain	33	18	6	4	24 94/105
27	dihedral straight burin	flint	deep patination	scalar	inverse	absent	34	25	6	5 2	24 94/110
27	dihedral straight burin	flint	deep patination	none	_	absent	70	21	6	7 7	24 94/113
27	dihedral straight burin	flint	deep patination	scalar	direct	plain	31	23	6	7 7	24 94/147d
27	dihedral straight burin	flint	deep patination	scalar	direct	absent	12	48	5	5 1	24 94/190
27	dihedral straight burin	flint	deep patination	none	_	plain	45	16	4	4 7	24 94/31
27	dihedral straight burin	flint	deep patination	scalar	inverse	plain	44	12	4	3 7	24 94/67
27	dihedral straight burin	flint	deep patination	none	_	absent	24	25	7	6 1	24 94/72
27	dihedral straight burin	flint	deep patination	scalar	direct	absent	31	19	5	3 7	24 94/77
27	dihedral straight burin	flint	deep patination	scalar	inverse	plain	32	18	6	5 9	24 94/89a
27	dihedral straight burin	flint	deep patination	none	_	plain	38	20	7	0 6	34 568/34
27	dihedral straight burin	flint	deep patination	sub-parallel	direct	absent	41	18	6	17	s 353
27	dihedral straight burin	flint	deep patination	scalar	direct	flat facetted	53	19	8	8	s 379
27	dihedral straight burin	flint	deep patination	scalar	direct	plain	72	28	8	15	s 380

ALL COLLECTIONS LIST BY TOOL TYPE

TYPE	CLASSIFICATION	MATERIAL	PATINATION	RETOUCH TYPE	R. POSITION	PLATFORM TYPE	L/mm	W/mm	Th/mm	W/g	ACC. NO.
27	dihedral straight burin	flint	deep patination	none	–	absent	35	15	4	1	s.381
27	dihedral straight burin	flint	deep patination	none	–	plain	54	21	8	9	s.382
27	dihedral straight burin	rhyolite	none	scalar	direct	absent	35	24	7	6.8	24.94/103
27	dihedral straight burin	rhyolite	none	none	–	absent	41	20	13	11.7	24.94/131
28	offset dihedral burin	flint	deep patination	none	none	absent	37	22	26	10.7	1968.1717
28	offset dihedral burin	flint	deep patination	scalar & sub-parallel	inverse	plain	21	42	10	9.5	24.94/125
28	offset dihedral burin	flint	deep patination	sub-parallel	inverse	absent	4	6	8	5.8	24.94/126
28	offset dihedral burin	flint	deep patination	none	–	point only	44	28	14	15.6	24.94/134
28	offset dihedral burin	flint	deep patination	none	–	absent	15	30	9	4.6	24.94/355.143
28	offset dihedral burin (on core trimming flake)	flint	deep patination	none	direct	absent	15	4	4	1.3	24.94/355.187
28	offset dihedral burin (broken)	flint	deep patination	none	–	dihedral	34	32	10	13.7	24.94/69
28	offset dihedral burin	flint	deep patination	none	–	flat facetted	31	19	4	3.9	50.406/3
28	offset dihedral burin	flint	slight patination	none	–	flat facetted	47	17	6	2.1	60.96/6h
28	offset dihedral burin	flint	slight patination	none	–	plain	29	17	6	7.8	60.96/7.85
28	offset dihedral burin (atypical)	flint	deep patination	none	–	absent	44	31	18	28.3	s.368
28	offset dihedral burin	flint	deep patination	sub-parallel	direct	plain	66	31	11	26	s.377
28	offset dihedral burin	rhyolite	none	none	–	absent	52	34	17	40.9	24.94/355.19
28	offset dihedral burin	unknown	none	none	direct	plain	55	12	7	25.6	60.96/8.15
28	offset dihedral burin (atypical)	flint	deep patination	none	–	absent	26	20	18	7.7	24.94/120
29	dihedral angle burin	flint	slight patination	scalar	inverse	convex facetted	39	14	5	4	24.94/97
29	dihedral angle burin	flint	deep patination	scalar	direct	plain	34	16	6	4	24.94/99a
29	dihedral angle burin	rhyolite	none	none	–	plain	19	21	4	2.4	24.94/112a
29	dihedral angle burin	flint	deep patination	sub-parallel	direct	plain	34	33	9	8.8	24.94/112b
30	burin on a break	flint	burnt	none	–	absent	25	15	6	2.6	24.94/355.192
30	burin on a break	flint	deep patination	s-l s s	direct	absent	32	22	10	8.9	24.94/74
30	burin on a break	flint	deep patination	none	–	point only	17	31	5	1.6	60.96/7.74
30	burin on a break	flint	deep patination	scalar	direct	absent	49	23	12	22	24.94/129
31	multiple dihedral burin	chert	none	scalar	bifacial	point only	30	64	21	46	s.370
32	busque burin	flint	deep patination	scalar	direct	absent	46	14	9	7.6	1968.1713
32	busqué burin	flint	deep patination	none	–	absent	33	20	9	8.7	24.94/115*
32	busqué burin (atypical)	flint	deep patination	none	–	absent	39	20	11	13.5	24.94/116*
32	busqué burin (atypical)	flint	deep patination	none	–	flat facetted	34	26	8	8.1	24.94/119
32	busqué burin	flint	deep patination	sub-parallel	bifacial	absent	46	27	25	42.3	24.94/65
32	busqué burin (atypical)	flint	slight patination	sub-parallel	inverse	absent	44	8	8	8	s.365
32	busque burin	chert	none	sub-parallel & s-l s s	direct	point only	21	36	10	11.4	24.94/101
34	burin on straight retouched truncation	flint	deep patination	abrupt	direct	absent	27	14	4	2	debitage 32
34	burin on straight retouched truncation	flint	deep patination	sub-parallel	inverse	flat facetted	34	22	8	8.5	24.94/136
34	burin on straight retouched truncation	flint	deep patination	scalar	direct	plain	40	25	7	6	s.366
34	burin on oblique retouched truncation	rhyolite	slight patination	scalar	inverse	flat facetted	70	28	14	32.8	24.94/187
34	burin on straight retouched truncation	flint	deep patination	sub-parallel	inverse	dihedral	34	22	12	8.5	24.94/135
35	burin on oblique retouched truncation	flint	deep patination	sub-parallel	inverse	convex facetted	34	15	7	4.5	s.374*
35	burin on oblique retouched truncation	flint	deep patination	sub-parallel	direct	absent	33	28	4	7.2	s.375*
35	burin on oblique retouched truncation	rhyolite	none	denticulate	inverse	plain	53	28	11	19.8	1968.1734
36	burin on concave retouched truncation	chert	none	abrupt	direct	absent	23	18	4	2.6	24.94/93
55	Font Robert Point (broken)	flint	deep patination	abrupt	direct	plain	60	30	11	13	s.418
58	totally backed blade	flint	deep patination	abrupt	direct	convex facetted	39	11	4	1	s.413
58	penknife point (broken)	flint	deep patination	abrupt	direct	absent	25	15	3	1	s.414
58	totally backed blade	flint	deep patination	abrupt	direct	absent	26	10	2	1	s.415
60	straight truncation	chert	none	abrupt	direct	absent	20	18	7	4	24.94/180*
60	straight truncation	flint	deep patination	scalar	direct	absent	26	21	4	3.5	24.94/152
60	straight truncation	flint	deep patination	scalar	direct	absent	25	23	8	6.1	24.94/184
60	straight truncation	flint	none	scalar	direct	plain	43	23	8	8	24.94/189b
60	straight truncation	flint	deep patination	abrupt	direct	absent	38	31	10	14.4	24.94/200
60	straight truncation	flint	deep patination	abrupt	inverse	plain	30	23	7	4.3	24.94/217
60	straight truncation	flint	deep patination	abrupt	direct	dihedral	31	21	8	6.3	24.94/355.175
60	straight truncation	flint	deep patination	sub-parallel	direct	flat facetted	31	29	12	14	s.326
60	straight truncation	flint	deep patination	sub-parallel	direct	absent	30	33	9	10	s.329

APPENDIX VIII Catalogue of Finds

ALL COLLECTIONS LIST BY TOOL TYPE

TYPE	CLASSIFICATION	MATERIAL	PATINATION	RETOUCH TYPE	R. POSITION	PLATFORM TYPE	L/mm	W/mm	Th/mm	W/g	ACC. NO.
60	straight truncation	flint	deep patination	scalar	direct	absent	36	8	7	5	s 333
60	straight truncation	flint	deep patination	abrupt	direct	convex facetted	37	34	10	11 5	s 352
60	straight truncation	flint	deep patination	sub-parallel	direct	absent	26	10	3	1 2	s 416
60	straight truncation (broken and glued)	other	none	abrupt	inverse	plain	49	22	7	5 1	34 568/29
60	straight truncation	rhyolite	none	abrupt	direct	absent	24	27	8	6 2	24 94/257
61	oblique truncation	flint	deep patination	scalar	direct	flat facetted	38	28	8	7 6	24 94/207*
61	oblique truncation	flint	none	none	–	plain	11	26	8	2 5	24 94/199*
61	oblique truncation	chert	none	subparallel	inverse	point only	28	14	11	9 5	24 94/275
61	oblique truncation	chert	none	s-l s s	direct	plain	27	31	9	11	24 94/281
61	oblique truncation	chert	none	sub-parallel	direct	plain	62	25	8	14	s 351
61	oblique truncation	flint	none	abrupt	direct	absent	18	20	8	3 3	debitage 24
61	oblique truncation	flint	deep patination	abrupt	direct	absent	–	–	–	–	"7" on piece
61	oblique truncation	flint	slight patination	scalar	direct	absent	28	19	10	5 6	24 94/185
61	oblique truncation	flint	deep patination	subparallel	inverse	absent	38	18	8	5 3	24 94/279
61	oblique truncation	flint	none	scalar	direct	plain	27	15	10	6 2	24 94/355 222
61	oblique truncation	flint	deep patination	abrupt	direct	absent	42	12	5	1 9	60 96/6d
61	oblique truncation	flint	slight patination	abrupt	inverse	absent	35	12	5	3	A909 1 78
61	oblique truncation	flint	deep patination	scalar	direct	dihedral	26	24	10	7	s 331
61	oblique truncation	flint	deep patination	scalar	direct	dihedral	35	23	9	8	s 332
61	oblique truncation	flint	deep patination	s-l s s	direct	point only	34	22	13	6 7	s 342
61	oblique truncation	flint	deep patination	sub-parallel	inverse	flat facetted	36	9	5	4	s 369
61	oblique truncation	flint	deep patination	scalar	direct	dihedral	61	22	7	10	s 378
61	oblique truncation	flint	deep patination	scalar	–	absent	20	12	4	1 1	s 417
61	oblique truncation (atypical)	rhyolite	none	sub-parallel	inverse	plain	60	20	10	16 6	24 94/144
62	concave truncation	flint	deep patination	abrupt	direct	absent	–	–	–	–	"9" on piece
62	concave truncation	flint	slight patination	abrupt	direct	plain	22	21	10	9 6	24 94/165
62	concave truncation	flint	deep patination	abrupt	direct	absent	33	30	7	9 4	24 94/201
62	concave truncation	flint	deep patination	abrupt	inverse	plain	37	24	8	9 2	24 94/202
62	concave truncation	flint	deep patination	abrupt	inverse	plain	18	16	5	0 8	34 568/24
62	concave truncation	flint	slight patination	sub-parallel	direct	absent	23	28	11	13	s 330
62	concave truncation	flint	deep patination	abrupt	direct	absent	50	26	7	12	s 364
62	piece with continuous retouch on one edge	flint	deep patination	scalar	direct	absent	29	23	8	6	24 94/283*
62	concave truncation	chert	none	stepped scalar	inverse	absent	59	15	6	4 5	24 94/255b
64	double truncation	flint	deep patination	scalar	direct	absent	37	29	10	3 9	34 568/25
64	double truncation (both concave)	flint	deep patination	abrupt	direct	absent	35	33	9	12	s 327
64	double truncation (both concave)	flint	deep patination	scalar	direct	absent	30	26	8	10	s 328
64	atypical "Cheddar Point"	flint	deep patination	abrupt	direct	absent	47	15	3	3	s 401
64	concave and oblique	rhyolite	none	scalar	direct	absent	41	21	11	13	s 392
65	piece with continuous retouch on one side	chert	none	scalar	direct	plain	58	29	8	22 6	1916 6-5 115
65	piece with continuous retouch on one side	chert	none	scalar	direct	absent	43	26	4	6 3	1916 6-5 118
65	piece with continuous retouch on one edge	chert	none	scalar	direct	plain	19	45	10	10 2	24 94/117
65	piece with continuous retouch on one edge	chert	none	sub-parallel	direct	flat facetted	31	32	18	17	24 94/142
65	piece with continuous retouch on one edge	chert	none	scalar	direct	flat facetted	28	25	14	11 2	24 94/237
65	piece with continuous retouch on one edge	chert	none	scalar	direct	absent	29	23	13	9 4	24 94/238
65	piece with continuous retouch on one edge	chert	none	abrupt	direct	plain	36	54	20	32 4	24 94/283
65	piece with continuous retouch on one edge	chert	none	scalar	direct	absent	49	18	5	5 1	24 94/321
65	piece with continuous retouch on one edge	chert	none	abrupt	inverse	absent	35	24	10	11 2	24 94/355 55
65	piece with continuous retouch on one edge (red colouration)	chert	none	none	–	plain	19	21	8	2 9	50 406/23 15
65	piece with continuous retouch on one side	chert	none	scalar	direct	flat facetted	35	31	6	15	s 307
65	piece with continuous retouch on one side	chert	none	scalar	direct	absent	35	27	16	15	s 311
65	piece with continuous retouch on one edge	flint	deep patination	abrupt	direct	absent	25	16	17	3 4	debitage 19
65	piece with continuous retouch on one edge	flint	deep patination	scalar	direct	absent	35	28	18	8 8	debitage 28
65	piece with continuous retouch on one edge	flint	deep patination	scalar	direct	absent	30	11	4	2 4	debitage 31
65	piece with continuous retouch on one edge	flint	deep patination	scalar	direct	plain	9	18	2	1	debitage 33
65	piece with continuous retouch on one edge	flint	deep patination	abrupt	inverse	absent	32	13	6	2 7	debitage 34
65	piece with continuous retouch on one edge	flint	deep patination	scalar	direct	absent	13	15	6	0 9	debitage 36
65	piece with continuous retouch on one edge	flint	deep patination	scalar	direct	point only	30	25	9	7	debitage 43

APPENDIX VIII Catalogue of Finds

ALL COLLECTIONS LIST BY TOOL TYPE

TYPE	CLASSIFICATION	MATERIAL	PATINATION	RETOUCH TYPE	R. POSITION	PLATFORM TYPE	L/mm	W/mm	Th/mm	W/g.	ACC. NO.
65	piece with continuous retouch on one edge	flint	deep patination	scalar	direct	plain	59	28	8	10 9	1968 1684
65	piece with continuous retouch on one edge (trimming flake)	flint	deep patination	s-l s s	direct	absent	29	15	7	3 8	1968 1685
65	piece with continuous retouch on one edge	flint	deep patination	scalar	direct	plain	34	22	6	7 2	1968 1716
65	piece with continuous retouch on one edge	flint	slight patination	scalar	direct	point only	48	9	10	5 6	15 277/8c
65	piece with continuous retouch on one edge	flint	slight patination	scalar	direct	flat facetted	40	26	11	_	15 277/8e
65	piece with continuous retouch on one edge	flint	deep patination	scalar	direct	absent	23	19	10	4	24 94/118
65	piece with continuous retouch on one edge	flint	deep patination	sub-parallel	inverse	dihedral	32	27	8	6 5	24 94/138
65	piece with continuous retouch on one edge	flint	deep patination	sub-parallel	direct	flat facetted	29	18	10	6 4	24 94/147a
65	piece with continuous retouch on one edge (atypical)	flint	deep patination	sub-parallel	bifacial	point only	42	32	14	13 1	24 94/147c
65	piece with continuous retouch on one edge	flint	deep patination	scalar	direct	absent	28	19	6	2 3	24 94/151a
65	piece with continuous retouch on one edge	flint	deep patination	abrupt	bifacial	absent	29	33	6	9 5	24 94/154
65	piece with continuous retouch on one edge	flint	deep patination	scalar	direct	absent	42	14	8	5 2	24 94/161
65	piece with continuous retouch on one edge	flint	slight patination	sub-parallel	direct	absent	42	25	13	13 6	24 94/164a
65	piece with continuous retouch on one edge	flint	deep patination	scalar	direct	absent	24	28	7	5 9	24 94/171
65	piece with continuous retouch on one edge	flint	deep patination	abrupt	direct	plain	44	34	7	14 1	24 94/193a
65	piece with continuous retouch on one edge	flint	deep patination	abrupt	bifacial	absent	25	28	5	3 2	24 94/25a
65	piece with continuous retouch on one edge	flint	deep patination	abrupt	inverse	absent	23	22	7	4	24 94/25b
65	piece with continuous retouch on one edge	flint	deep patination	abrupt	direct	absent	22	18	5	2 7	24 94/26a
65	piece with continuous retouch on one edge	flint	deep patination	abrupt	inverse	plain	30	13	3	1 3	24 94/292
65	piece with continuous retouch on one edge	flint	slight patination	sub-parallel	direct	plain	32	42	10	15 2	24 94/29b
65	piece with continuous retouch on one edge	flint	deep patination	scalar & sub-parallel	direct	plain	53	39	13	27 6	24 94/306
65	piece with continuous retouch on one edge	flint	deep patination	scalar	direct	absent	50	16	8	7 3	24 94/326
65	piece with continuous retouch on one edge	flint	deep patination	scalar	direct	plain	48	17	5	4 4	24 94/330
65	piece with continuous retouch on one edge	flint	deep patination	abrupt	direct	plain	55	25	11	2	24 94/345
65	piece with continuous retouch on one edge	flint	deep patination	scalar	direct	plain	59	28	14	2 5	24 94/347
65	piece with continuous retouch on one edge	flint	none	scalar	direct	absent	16	24	8	5 4	24 94/355 120
65	piece with continuous retouch on one edge	flint	deep patination	sub-parallel	direct	absent	29	12	4	2 7	24 94/355 142
65	piece with continuous retouch on one edge	flint	deep patination	scalar	direct	absent	31	20	7	4 4	24 94/355 176
65	piece with continuous retouch on one edge	flint	deep patination	scalar	direct	plain	34	11	5	3 1	24 94/355 200
65	piece with continuous retouch on one edge	flint	deep patination	scalar	direct	absent	27	37	20	20 7	24 94/73
65	piece with continuous retouch on one edge	flint	deep patination	scalar	direct	absent	31	14	10	5 2	24 94/75
65	piece with continuous retouch on one edge	flint	deep patination	abrupt	inverse	flat facetted	23	19	6	3 7	34 568/1
65	piece with continuous retouch on one edge	flint	deep patination	scalar	direct	absent	24	22	7	10 1	34 568/19
65	piece with continuous retouch on one edge	flint	deep patination	none	_	absent	51	25	12	3 5	50 406/1
65	piece with continuous retouch on one edge	flint		scalar	inverse	plain	29	24	9	15 3	50 406/24
65	piece with continuous retouch on one edge	flint	deep patination	none	direct	point only	30	27	10	0 7	60 96/7 18
65	piece with continuous retouch on one edge	flint	slight patination	scalar	bifacial	dihedral	25	18	7	2 8	60 96/7 38
65	piece with continuous retouch on one edge	flint	deep patination	scalar	direct	point only	27	20	8	8 7	60 96/7 78
65	piece with continuous retouch on one edge (possible broken leaf point)	flint	none	none	_	plain	25	18	9	1 4	60 96/8 3
65	piece with continuous retouch on one edge	flint	deep patination	abrupt	inverse	absent	31	13	3	1	A909 1.33
65	piece with continuous retouch on one edge	flint	deep patination	scalar	direct	point only	34	23	7	8 7	s 315
65	piece with continuous retouch on one side	flint	deep patination	scalar	direct	convex facetted	39	20	5	6 3	s 373*
65	piece with continuous retouch on one side	flint	deep patination	abrupt	direct	absent	47	14	5	4	s 400
65	piece with continuous retouch on one side	flint	deep patination	scalar	direct	absent	21	13	7	1 9	s 408
65	piece with continuous retouch on one side (trimming flake)	flint	none	s-l s s	direct	absent	73	30	4	34	s 419
65	piece with continuous retouch on one side (trimming flake)	flint	deep patination	parallel	direct	absent	45	22	11	13	s 421
65	piece with continuous retouch on one side	flint	none	scalar	direct	absent	52	15	10	10	s 422
65	piece with continuous retouch on one side (trimming flake)	other	none	sub-parallel	inverse	point only	38	15	5	4 1	50 406/15
65	piece with continuous retouch on one edge	rhyolite	none	abrupt	direct	absent	34	45	14	30 3	24 94/261
65	piece with continuous retouch on one edge	rhyolite	none	scalar	direct	absent	19	11	3	0 9	24 94/28c
65	piece with continuous retouch on one side	rhyolite	none	scalar	direct	plain	60	18	5	7	s 389
66	piece with continuous retouch on both edges (possibly leaf point)	chert	none	scalar	_	plain	24	18	6	5	24 94/313
66	piece with continuous retouch on both edges	chert	none	scalar	_	absent	15	21	6	15 7	60 96/8 11
66	piece with continuous retouch on both edges	chert	none	scalar	direct	absent	33	27	12	13 5	s 319
66	piece with continuous retouch on both edges	flint	deep patination	abrupt	direct	absent	18	25	9	5 8	debitage 41
66	piece with continuous retouch on both edges	flint	deep patination	abrupt	direct	plain	40	27	8	10 7	24 94/206*
66	piece with continuous retouch on both edges	flint	deep patination	scalar	bifacial	plain	30	28	5	5 4	24 94/300

ALL COLLECTIONS: LIST BY TOOL TYPE.

TYPE	CLASSIFICATION	MATERIAL	PATINATION	RETOUCH TYPE	R. POSITION	PLATFORM TYPE	L/mm	W/mm	Th/mm	W/g	ACC. NO.
66	piece with continuous retouch on both edges	flint	deep patination	scalar	direct	flat facetted	26	23	6	3 1	24 94/301
66	piece with continuous retouch on both edges	flint	deep patination	abrupt	direct	plain	19	22	6	4 5	24 94/30b
66	piece with continuous retouch on both edges	flint	deep patination	scalar	direct	plain	24	12	8	3 3	24 94/355 166
66	piece with continuous retouch on both edges	rhyolite	none	none	direct	plain	29	43	7	29	24 94/167
67	Aurignacian blade	flint	deep patination	scalar	direct	plain	44	35	8	3 3	24 94/346*
69	leaf point (broken)	chert	none	scalar	bifacial	absent	16	17	7	2 4	24 94/349*
69	leaf point	chert	none	scalar	bifacial	absent	80	28	7	25	s 420
69	leaf point	flint	none	scalar	direct	absent	60	18	10	CAST	(cast) s 424
69	bifacially worked piece (possible leaf point fragment)	flint	deep patination	scalar	bifacial	absent	43	35	11	14 8	24 94/355 218
69	leaf point (broken)	rhyolite	none	scalar	inverse	absent	36	18	8	5 9	24 94/314a
69	leaf point (broken)	rhyolite	none	scalar	bifacial	absent	22	23	9	4 7	24 94/315
69	leaf point (broken)	flint	slight patination	scalar	bifacial	absent	39	40	10	23 6	s 317*
75	denticulate	flint	deep patination	denticulate	direct	absent	27	16	6	3 9	24 94/9
77	side-scraper (atypical)	chert	none	abrupt	direct	absent	30	12	13	10 7	24 94/15b
77	side-scraper	chert	none	sub-parallel	direct	plain	31	25	9	9 2	24 94/16b
77	side-scraper	flint	deep patination	sub-parallel	bifacial	absent	25	25	13	10 2	24 94/12
77	side-scraper (denticulate)	flint	deep patination	scalar	bifacial	absent	26	15	8	4 2	24 94/16a
77	side-scraper	flint	deep patination	s-l s s	bifacial	point only	25	34	13	14 1	24 94/18a
77	side-scraper	flint	deep patination	sub-parallel	direct	dihedral	16	12	4	1	24 94/2
77	side-scraper	flint	deep patination	abrupt	direct	absent	24	15	11	5	24 94/22b
77	side-scraper	flint	deep patination	scalar	direct	absent	22	18	7	3 4	24 94/23b
77	side-scraper	flint	deep patination	scalar	direct	plain	26	22	10	6 3	24 94/29a
77	side-scraper	flint	deep patination	sub-parallel	direct	plain	33	56	22	41 4	24 94/64
77	side-scraper	flint	deep patination	denticulate	direct	absent	44	24	11	14 2	24 94/8b
77	side-scraper	flint	deep patination	s-l s s	direct	point only	72	40	13	34	s 367
84	convex truncation	flint	none	sub-parallel	inverse	absent	58	15	6	4 5	24 94/287
84	truncated bladelet (cheddar point)	flint	deep patination	sub-parallel	direct	absent	49	13	4	2 7	24 94/28t
85	backed bladelet	flint	deep patination	abrupt	direct	absent	25	15	3	2 1	debitage 20
85	backed bladelet	flint	deep patination	abrupt	direct	absent	23	18	3	1 4	debitage 26
85	backed bladelet (retouched cortical edge)	flint	deep patination	abrupt	inverse	absent	32	10	4	1 6	24 94/289
85	backed bladelet	flint	burnt	abrupt	inverse	absent	22	11	5	2	24 94/290
85	backed bladelet	flint	slight patination	none	_	absent	32	10	4	1 9	24 94/291
85	backed bladelet (fragment)	flint	deep patination	abrupt	inverse	absent	20	13	6	1 4	24 94/295
85	backed bladelet	flint	deep patination	scalar	direct	plain	22	8	3	0 5	24 94/355 133b
85	backed bladelet (fragment)	flint	deep patination	abrupt	direct	absent	20	11	4	14 9	24 94/398
92	blade pointed by retouch	flint	deep patination	sub-parallel	inverse	absent	45	13	7	4 6	24 94/288
92	blade narrowed by retouch	flint	deep patination	scalar	direct	absent	42	16	7	6	s 396
92	blade pointed by retouch	rhyolite	none	abrupt	direct	absent	53	16	7	6 2	24 94/320
93	debitage	rhyolite	none	scalar	direct	absent	80	90	30	303	98 18*
93	debitage	flint	deep patination	scalar	direct	absent	39	33	12	19 8	24 94/39*
93	debitage	chert	deep patination	scalar	direct	dihedral	41	13	4	2 9	debitage 16
93	debitage	chert	deep patination	abrupt	direct	absent	35	23	5	6 8	debitage 22
93	debitage	chert	slight patination	sub-parallel	inverse	absent	27	19	7	4 4	debitage 25
93	debitage	chert	none	?abrupt	?inverse	absent	26	6	10	6 6	1968 1727
93	debitage	chert	slight patination	none	none	absent	21	17	9	4 6	1968 1732
93	bifacially retouched piece/ disc core	chert	none	none	_	point only	_	_	_	_	"Pavisland Dec 1914"
93	debitage	chert	none	none	_	plain	43	31	5	10 8	1916 6-5 116
93	debitage (hard beige sediment dorsal side)	chert	slight patination	none	_	plain	61	16	5	10 8	1946 7-1 2
93	debitage	chert	none	scalar	direct	absent	28	22	4	3	A909 1 117
93	debitage	chert	deep patination	none	_	absent	33	2	7	<1	A909 1 122
93	debitage (large trimming flake)	chert	none	none	_	dihedral	123	33	39	204	A909 1 38
93	debitage	chert	none	none	_	plain	60	35	7	14	A909 1 39
93	debitage	chert	none	none	_	point only	56	23	3	8	A909 1 44
93	debitage	chert	none	scalar	direct	point only	46	30	10	14	A909 1 45
93	debitage	chert	none	none	_	plain	50	17	12	8	A909 1 57
93	retouched piece	chert	none	scalar	direct	point only	40	61	14	53	s 292
93	debitage	chert	none	scalar	direct	absent	40	26	14	10	s 296

ALL COLLECTIONS: LIST BY TOOL TYPE.

TYPE	CLASSIFICATION	MATERIAL	PATINATION	RETOUCH TYPE	R. POSITION	PLATFORM TYPE	L/mm	W/mm	Th/mm	W/g	ACC. NO.
93	debitage	chert	none	scalar	bifacial	absent	44	39	13	18	s 297
93	debitage	chert	none	none	_	plain	28	35	13	18	s 298
93	debitage	chert	none	none	_	plain	30	26	10	10	s 299
93	debitage	chert	none	sub-parallel	direct	absent	40	24	11	13	s 300
93	debitage	chert	none	sub-parallel	direct	absent	56	38	21	49 8	s 308
93	debitage	chert	none	none	_	absent	26	39	17	18	s 313
93	debitage	chert	none	scalar	direct	absent	40	31	7	14	s 388
93	debitage	flint	deep patination	scalar	direct	absent	69	19	5	9 2	debitage 8
93	debitage	flint	deep patination	sub-parallel	direct	absent	11	18	3	0 8	debitage 17
93	debitage	flint	deep patination	scalar	direct	absent	37	26	8	8 1	debitage 18
93	debitage	flint	deep patination	scalar	_	absent	31	26	4	2 6	debitage 23
93	debitage	flint	deep patination	scalar	direct	point only	12	21	4	1 8	debitage 38
93	debitage (trimming flake)	flint	deep patination	sub-parallel	direct	plain	16	20	7	2 9	debitage 39
93	debitage	flint	deep patination	sub-parallel	direct	absent	10	18	5	2 1	debitage 40
93	debitage	flint	deep patination	scalar	direct	absent	15	14	5	2	debitage 42
93	debitage	flint	deep patination	none	none	plain	29	24	4	5 2	1968 1683
93	debitage (blade)	flint	slight patination	none	none	plain	32	21	8	7 4	1968 1690
93	debitage	flint	deep patination	none	none	absent	34	21	4	4 9	1968 1691
93	debitage	flint	deep patination	none	none	absent	21	21	7	6 2	1968 1693
93	debitage	flint	deep patination	none	none	absent	18	14	8	2 1	1968 1695
93	debitage (core remnant)	flint	deep patination	none	none	absent	24	27	11	5 4	1968 1708
93	debitage (trimming flake)	flint	deep patination	none	none	absent	23	22	10	5 7	1968 1714
93	debitage (burin spall)	flint	deep patination	none	none	absent	37	4	3	0 6	1968 1718
93	debitage (river gravel staining)	flint	deep patination	none	none	point only	20	16	5	2 3	1968 1719
93	debitage	flint	slight patination	none	_	plain	74	24	7	11 4	1916 6-5 108
93	debitage (rejuvination flake)	flint	deep patination	none	_	flat facetted	63	20	8	12 8	1916 6-5 110
93	debitage	flint	slight patination	none	_	flat facetted	40	24	3	5 9	1916 6-5 111
93	debitage (retouched point)	flint	slight patination	none	_	absent	42	14	3	3 3	1916 6-5 112
93	debitage	flint	deep patination	none	_	absent	40	18	7	5 4	1916 6-5 113
93	debitage (large burin spall or bladelet)	flint	deep patination	none	_	flat facetted	44	5	4	1 6	1916 6-5 114
93	debitage (red staining)	flint	none	none	_	point only	45	22	5	9 2	1916 6-5 119
93	debitage	flint	deep patination	none	_	flat facetted	72	18	9	10 3	1946 7-1 3
93	debitage (hard beige sediment dorsal side)	flint	deep patination	scalar	direct	plain	75	28	6	10	1946 7-1 4
93	debitage (hard beige sediment dorsal side and cortex)	flint	deep patination	none	_	convex facetted	48	30	13	13 8	1946 7-1 5
93	debitage	flint	deep patination	none	_	plain	22	21	6	3	A909 1 105
93	debitage	flint	deep patination	none	_	absent	12	18	8	1	A909 1 107
93	debitage	flint	deep patination	none	_	flat facetted	33	30	7	11	A909 1 108
93	debitage	flint	deep patination	none	_	flat facetted	55	25	10	12	A909 1 11
93	debitage	flint	deep patination	none	_	absent	34	14	6	2	A909 1 110a
93	debitage	flint	deep patination	none	_	dihedral	44	20	15	19	A909 1 110b
93	debitage	flint	deep patination	none	_	absent	40	24	14	11	A909 1 111
93	debitage	flint	deep patination	none	_	plain	45	32	14	20	A909 1 112
93	debitage (yellow/ orange colouration)	flint	deep patination	none	_	plain	32	15	5	2	A909 1 118
93	debitage	flint	deep patination	none	_	absent	33	13	4	2	A909 1 119
93	debitage	flint	deep patination	none	_	absent	13	13	3	< 1	A909 1 120
93	debitage	flint	deep patination	none	_	point only	45	23	3	2	A909 1 25
93	debitage	flint	deep patination	none	_	flat facetted	53	20	17	8	A909 1 26
93	debitage	flint	slight patination	none	_	absent	15	42	6	4	A909 1 27
93	debitage	flint	deep patination	none	_	point only	40	15	2	1	A909 1 30
93	debitage	flint	deep patination	none	_	absent	40	14	2	1	A909 1 34
93	debitage	flint	slight patination	none	_	dihedral	125	28	5	152	A909 1 37
93	debitage	flint	deep patination	none	_	absent	50	22	7	6	A909 1 40
93	debitage	flint	deep patination	none	_	point only	55	25	8	10	A909 1 42
93	debitage	flint	deep patination	none	_	flat facetted	32	41	7	12	A909 1 50
93	debitage	flint	deep patination	none	_	plain	56	31	10	32	A909 1 51
93	debitage	flint	deep patination	none	_	convex facetted	52	27	4	4	A909 1 52
93	debitage (core rejuvination flake)	flint	deep patination	none	_	dihedral	63	46	12	54	A909 1 53

ALL COLLECTIONS: LIST BY TOOL TYPE

TYPE	CLASSIFICATION	MATERIAL	PATINATION	RETOUCH TYPE	R. POSITION	PLATFORM TYPE	L/mm	W/mm	Th/mm	W/g	ACC. NO.
93	debitage	flint	deep patination	none	_	absent	59	19	9	8	A909 1 54
93	debitage	flint	slight patination	none	_	absent	51	23	9	10	A909 1 55
93	debitage	flint	deep patination	none	_	flat facetted	39	45	9	27	A909 1 56
93	debitage	flint	deep patination	none	_	absent	20	23	8	2	A909 1 58
93	debitage	flint	deep patination	none	_	absent	29	19	10	4	A909 1 59
93	debitage (core rejuvination flake)	flint	deep patination	none	direct	point only	54	27	16	39	A909 1 61
93	debitage	flint	deep patination	scalar	_	plain	17	42	5	3	A909 1 62
93	debitage	flint	deep patination	none	direct	plain	27	18	7	4	A909 1 63
93	debitage	flint	deep patination	none	_	point only	32	21	4	8	A909 1 65
93	debitage (possible starch fracture)	flint	slight patination	none	_	dihedral	19	62	9	17	A909 1 68
93	debitage (core trimming flake)	flint	deep patination	abrupt	direct	absent	37	15	8	7	A909 1 69
93	debitage	flint	deep patination	none	_	point only	50	29	5	10	A909 1 76
93	debitage	flint	deep patination	none	_	absent	27	6	3	1	A909 1 77
93	debitage (core rejuvination flake)	flint	deep patination	none	_	convex facetted	28	20	3	5	A909 1 79
93	debitage	flint	deep patination	none	_	point only	6	35	5	18	A909 1 8
93	debitage (thinning flake)	flint	deep patination	none	_	plain	22	30	2	1	A909 1 81
93	debitage	flint	deep patination	none	_	plain	30	31	2	2	A909 1 84
93	debitage	flint	deep patination	none	_	dihedral	8	38	6	7	A909 1 87
93	debitage	flint	deep patination	none	_	convex facetted	31	22	5	2	A909 1 88
93	debitage	flint	deep patination	none	_	plain	35	22	7	9	A909 1 89
93	debitage	flint	deep patination	none	_	point only	33	34	7	23	A909 1 90
93	debitage	flint	deep patination	none	_	plain	30	28	2	2	A909 1 91
93	debitage	flint	deep patination	none	_	absent	26	19	6	3	A909 1 93
93	debitage (thinning flake)	flint	deep patination	none	_	flat facetted	17	28	4	2	A909 1 94
93	debitage	flint	deep patination	none	_	absent	16	8	3	1	A909 1 95
93	debitage	flint	deep patination	none	_	absent	39	15	4	3	A909 1 96
93	debitage	flint	deep patination	sub-parallel	direct	absent	28	27	6	3	A909 1 97
93	debitage (core fragment)	flint	deep patination	none	_	plain	37	19	8	9	A909 1 98
93	debitage	flint	deep patination	none	_	absent	30	29	6	1	A909 1 99
93	large flake	flint	deep patination	scalar	direct	dihedral	180	56	26	143	s 290
93	debitage	flint	deep patination	none	_	absent	53	37	6	14 3	s 303
93	debitage	flint	deep patination	none	_	absent	22	39	9	9 1	s 305
93	debitage	flint	deep patination	scalar	direct	plain	26	40	19	27	s 308
93	debitage	flint	deep patination	none	_	absent	32	31	12	12	s 309
93	debitage	flint	deep patination	scalar	direct	plain	33	33	7	10 3	s 318
93	debitage	flint	deep patination	none	_	dihedral	37	38	12	18 7	s 320
93	debitage (trimming flake)	flint	slight patination	sub-parallel	direct	flat facetted	37	26	21	15	s 323
93	debitage	flint	deep patination	none	_	point only	37	23	11	11 3	s 324
93	debitage	flint	deep patination	none	_	point only	29	33	15	13 8	s 338
93	debitage	flint	none	none	_	absent	35	34	15	26 4	s 340
93	debitage	flint	deep patination	none	_	absent	40	35	15	29	s 383
93	debitage	flint	deep patination	none	_	absent	25	29	7	5 9	s 384
93	debitage	flint	deep patination	none	_	absent	30	13	8	3 6	s 385
93	debitage	flint	deep patination	none	_	absent	26	14	7	2 3	s 386
93	debitage	flint	deep patination	none	_	absent	31	22	8	6 3	s 387
93	debitage	flint	deep patination	s-l s s	direct	plain	32	18	7	3	s 397
93	debitage (burin spall)	flint	deep patination	sub-parallel	direct	plain	35	6	3	0 7	s 402
93	debitage (burin spall)	flint	slight patination	none	_	absent	22	4	5	0 6	s 403
93	debitage	flint	slight patination	none	_	absent	23	15	4	1 3	s 404
93	debitage	flint	deep patination	none	_	plain	9	23	2	0 6	s 405
93	debitage	flint	deep patination	abrupt	direct	absent	18	4	1	0 1	s 406
93	debitage	flint	deep patination	none	_	absent	10	15	3	0 5	s 409
93	debitage	flint	deep patination	none	_	absent	9	7	2	0 2	s 410
93	burin spall (broken and glued)	flint	deep patination	none	_	absent	20	4	3	0 3	s 412
93	trimming flake with invasive retouch	flint	deep patination	_	_	_	55	23	11	11	s 425
93	debitage	flint	deep patination	scalar	direct	dihedral	30	28	6	6	s 703
93	debitage	other	slight patination	none	_	point only	54	25	6	10 1	1916 6-5 109

ALL COLLECTIONS: LIST BY TOOL TYPE.

TYPE	CLASSIFICATION	MATERIAL	PATINATION	RETOUCH TYPE	R. POSITION	PLATFORM TYPE	L/mm	W/mm	Th/mm	W/g	ACC. NO.
93	debitage	other	slight patination	none	_	absent	35	42	10	18	A909.1.49
93	hammerstone (of hornblende)	other	_	_	_	_	57	39	21	85	s.426
93	hammerstone (of silicified breccia)	other	_	_	_	_	63	38	34	111	s.427
93	debitage	rhyolite	none	scalar	inverse	absent	32	25	5	5.4	debitage 15
93	debitage	rhyolite	slight patination	none	none	plain	34	31	7	9.6	1968.1723
93	debitage	rhyolite	none	none	none	absent	27	25	7	5.7	1968.1724
93	debitage	rhyolite	none	none	none	absent	39	37	10	16.9	1968.1730
93	debitage (possible nosed corner)	rhyolite	none	none	_	absent	32	17	4	2	A909.1.104
93	debitage	rhyolite	none	none	_	plain	55	20	5	10	A909.1.20
93	debitage	rhyolite	none	none	_	plain	43	36	6	16	A909.1.67
93	debitage	rhyolite	none	scalar	bifacial	absent	25	30	14	17	s.316
93	flake scraper	rhyolite	none	sub-parallel	direct	absent	44	40	15	33.7	s.337
93	debitage	rhyolite	none	none	_	plain	25	38	7	9	s.391
93	debitage	chert	none	none	_	absent	60	50	40	130.6	5106
106	core	flint	none	none	_	absent	49	73	61	274.1	4108
106	core	flint	none	none	_	absent	94	63	50	301.4	5104
106	core	flint	none	none	_	absent	84	52	33	198.4	5109
106	core (broken and glued)	rhyolite	none	none	_	absent	114	520	400	270.6	5100
106	core	chert	none	scalar	direct	point only	40	30	24	19.2	24.94/34
106	core	flint	none	none	_	absent	24	27	15	13.4	24.94/351*
106	core	chert	none	none	_	absent	29	24	16	17.7	24.94/355.3
106	core	rhyolite	none	none	_	point only	22	20	17	10.8	24.94/32a*
106	core	chert	none	parallel	direct	absent	44	22	22	26.5	24.94/63
106	core	chert	none	none	_	convex facetted	52	31	17	17.8	50.406/23.1
106	core	chert	slight patination	none	_	plain	27	26	15	3	60.96/7.62
106	core	flint	deep patination	none	_	absent	19	25	12	9.9	24.94/11
106	core	flint	deep patination	none	_	absent	40	42	34	102.4	24.94/30a
106	core	flint	deep patination	none	_	absent	53	9	15	41.8	24.94/352
106	core	flint	deep patination	none	_	absent	44	13	13	6	24.94/353b
106	core	flint	deep patination	none	_	absent	33	20	10	7.2	24.94/354
106	core	flint	deep patination	none	_	absent	24	23	9	7.6	24.94/355.147
106	core	flint	deep patination	none	_	point only	20	37	11	10.4	24.94/355.148
106	core fragment	flint	deep patination	none	_	point only	20	15	10	4.6	24.94/355.163
106	bladelet core	flint	deep patination	none	_	absent	33	18	11	10.9	24.94/355.164
106	bladelet core fragment (on beach pebble)	flint	deep patination	sub-parallel	direct	absent	23	30	13	11.7	24.94/355.197
106	bladelet core	flint	slight patination	none	_	absent	18	35	17	13.4	24.94/355.202
106	flake core	flint	deep patination	none	_	plain	29	20	15	8.9	24.94/355.209
106	flake core	flint	deep patination	none	_	absent	25	24	25	22.5	24.94/36
106	core	flint	deep patination	none	_	plain	33	34	20	23.2	24.94/38
106	core	flint	deep patination	parallel	bifacial	absent	32	30	23	23.2	24.94/81
106	core	flint	deep patination	sub-parallel	inverse	absent	41	22	5	6.6	24.94/70
106	core	flint	deep patination	s-l s s	direct	plain	38	47	13	25.3	24.94/71
106	core	flint	deep patination	none	_	absent	30	16	15	10.7	34.568/10
106	core	flint	slight patination	none	_	absent	37	40	37	48.6	60.96/2
106	core	flint	deep patination	none	_	point only	46	44	25	5.2	60.96/4
106	core	flint	deep patination	sub-parallel	direct	plain	40	50	15	7.9	60.96/5
106	core	flint	deep patination	sub-parallel	_	plain	42	49	30	2.7	60.96/7.10
106	core	flint	deep patination	none	_	plain	36	18	19	0.5	60.96/7.20
106	core	flint	deep patination	scalar	_	point only	38	17	20	1	60.96/7.6
106	core	flint	deep patination	none	_	point only	43	26	17	2.9	60.96/7.79
106	core	flint	none	none	_	absent	25	19	6	5.3	60.96/7.89
106	core	rhyolite	slight patination	none	none	absent	50	25	35	75.4	1968.1736
106	core	rhyolite	none	none	_	absent	40	30	24	39.3	24.94/33a
106	core	rhyolite	none	none	_	absent	30	45	22	35.4	24.94/355.2
106	core	rhyolite	none	none	_	absent	33	22	17	14.7	60.96/8.2
106	core	chert	none	none	_	absent	49	24	8	7	s.295
107	single burin	flint	deep patination	none	_	absent	22	14	5	2.4	debitage 27
107	single burin										

APPENDIX VIII: Catalogue of Finds

ALL COLLECTIONS: LIST BY TOOL TYPE.

TYPE	CLASSIFICATION	MATERIAL	PATINATION	RETOUCH TYPE	R. POSITION	PLATFORM TYPE	L/mm	W/mm	Th/mm	W/g	ACC. NO.
107	single burin	flint	deep patination	none	_	absent	32	21	10	7 9	debitage 30
107	single burin	flint	deep patination	none	_	plain	10	18	3	2 2	debitage 37
107	single burin	flint	deep patination	none	_	absent	25	21	5	3 6	debitage 44
107	single burin on partially retouched blade	flint	deep patination	abrupt	direct	convex facetted	49	12	5	3	s 399
107	single burin	chert	none	none	_	absent	45	18	10	10 2	24 94/121
107	single burin	chert	none	scalar	direct	plain	36	18	7	8 2	24 94/88
107	single burin	chert	none	scalar	direct	absent	28	11	4	2 5	24 94/89b
107	single burin	flint	slight patination	sub-parallel	direct	absent	37	27	8	7 1	15 277/8a
107	single burin	flint	deep patination	scalar	direct	absent	31	23	8	9 6	24 94/111
107	single burin	flint	deep patination	none	none	point only	51	16	5	4 8	24 94/122
107	single burin	flint	deep patination	none	_	plain	23	44	14	17 9	24 94/133
107	single burin	flint	deep patination	scalar	direct	flat facetted	25	11	6	6 7	24 94/137
107	single burin	flint	deep patination	stepped scalar	direct	absent	27	23	11	7 2	24 94/19a
107	single burin	flint	deep patination	none	_	plain	37	23	12	10 3	24 94/23a
107	single burin	flint	burnt	none	_	absent	34	26	10	10 3	24 94/355 128
107	single burin	flint	deep patination	abrupt	direct	convex facetted	30	35	13	16 8	24 94/82
107	single burin	flint	deep patination	none	_	plain	25	17	10	3 9	24 94/83
107	single burin	flint	deep patination	none	_	absent	40	16	7	6 1	24 94/86
107	single burin	flint	deep patination	scalar	direct	absent	30	19	5	5	24 94/90
107	single burin	flint	deep patination	abrupt	direct	flat facetted	40	19	5	4 9	24 94/91
107	single burin	flint	deep patination	scalar	inverse	absent	35	17	6	3 9	24 94/98
107	single burin	flint	slight patination	invasive stepped scalar	direct	point only	32	21	8	0 6	34 568/3
107	single burin	flint	deep patination	none	_	absent	33	19	3	2	A909 1 80

ALL COLLECTIONS: LIST BY AGE OF ARTEFACTS.

DATE	TYPE	CLASSIFICATION	MATERIAL	L/mm	W/mm	Th/mm	W/g.	ACC. NO.	MUSEUM
Lower Palaeolithic/ Mousterian	93	"Proto-Levallois" flake	chert	80	90	30	303	98.18*	N.M.G.W.
Lower Palaeolithic/ Mousterian	93	handaxe	rhyolite	40	30	24	135.1	24.94/32a*	N.M.G.W.
Mousterian	93	radially flaked disc core	flint	39	33	12	19.8	24.94/39*	N.M.G.W.
Mousterian	93	bifacially retouched piece/ possible disc core	chert	–	–	–	–	"Pavisland Dec 1914"	Swansea
definite E.U.P. (leaf point phase)	69	leaf point (broken)	rhyolite	36	18	8	5.9	24.94/314a	N.M.G.W.
definite E.U.P. (leaf point phase)	69	leaf point (broken)	rhyolite	22	23	9	4.7	24.94/315	N.M.G.W.
definite E.U.P. (leaf point phase)	69	leaf point (broken)	chert	16	17	7	2.4	24.94/312	N.M.G.W.
definite E.U.P. (leaf point phase)	69	leaf point (broken)	chert	16	17	7	2.4	24.94/349*	N.M.G.W.
definite E.U.P. (leaf point phase)	69	leaf point	chert	80	28	7	25	s.420	O.U.M.
definite E.U.P. (leaf point phase)	69	leaf point	flint	39	40	10	23.6	s.317*	O.U.M.
definite E.U.P. (Aurignacian)	6	end-scraper on Aurignacian blade (Sollas:" from ochre bed")	flint	82	19	7	16	s.347	O.U.M.
definite E.U.P. (Aurignacian)	11	carinated end-scraper	flint	25	32	24	21.4	s.354*	O.U.M.
definite E.U.P. (Aurignacian)	32	busqué burin	flint	46	14	9	7.6	1968.1713	Ashmolean
definite E.U.P. (Aurignacian)	32	busqué burin	flint	33	20	9	8.7	24.94/115*	N.M.G.W.
definite E.U.P. (Aurignaclan)	32	busqué burin	flint	39	20	11	13.5	24.94/116*	N.M.G.W.
definite E.U.P. (Aurignacian)	32	busqué burin	flint	34	26	8	8.1	24.94/119	N.M.G.W.
definite E.U.P. (Aurignacian)	32	busqué burin (atypical)	flint	46	27	25	42.3	24.94/65	N.M.G.W.
definite E.U.P. (Aurignacian)	32	busqué burin	chert	30	64	21	46	s.370	O.U.M.
definite E.U.P. (Aurignacian)	32	busqué burin	flint	44	8	8	8	s.365	O.U.M.
definite E.U.P. (Aurignacian)	67	Aurignacian blade	flint	44	35	8	3.3	24.94/346*	N.M.G.W.
definite E.U.P. (Upper Perigordian)	55	Font Robert Point (broken - tang only)	flint	60	30	11	13	s.418	O.U.M.
probable E.U.P.	1	single end-scraper	flint	29	29	10	12.3	24.94/210	N.M.G.W.
probable E.U.P.	1	single end-scraper	flint	37	22	8	7.8	15.277/8g	N.M.G.W.
probable E.U.P.	1	single end-scraper	flint	56	39	7	5.9	50.406/10	N.M.G.W.
probable E.U.P.	1	single end-scraper	flint	31	34	7	19.6	50.406/6	N.M.G.W.
probable E.U.P.	1	single endscraper	flint	53	27	6	11	15.277/8i	N.M.G.W.
probable E.U.P.	1	single end-scraper	flint	26	13	6	2.6	debitage 35*	O.U.M.
probable E.U.P.	1	single end-scraper	flint	–	–	–	–	A909.1.10	Swansea
probable E.U.P.	1	single end-scraper	flint	35	29	4	10	A909.1.41	Swansea
probable E.U.P.	2	atypical end-scraper	flint	33	17	8	3.9	debitage 29	O.U.M.
probable E.U.P.	2	atypical end-scraper	flint	35	25	8	7.6	s.348	O.U.M.
probable E.U.P.	2	atypical end-scraper	flint	34	20	5	3.2	s.350*	O.U.M.
probable E.U.P.	2	atypical end-scraper	flint	39	31	11	14	s.358	O.U.M.
probable E.U.P.	2	atypical end-scraper (on trimming flake)	flint	45	26	12	3.2	s.346	O.U.M.
probable E.U.P.	5	end-scraper on retouched blade	flint	–	–	–	–	836.1.16	Swansea
probable E.U.P.	12	atypical carinated end-scraper	flint	14	7	6	1.1	1968.1703	Ashmolean
probable E.U.P.	12	atypical carinated end-scraper	flint	17	31	20	6.7	60.96/3	N.M.G.W.
probable E.U.P.	12	atypical carinated end-scraper	flint	38	29	25	33	s.321	O.U.M.
probable E.U.P.	13	thick nosed end-scraper (with river gravel staining)	flint	15	16	5	1.7	1968.1694	Ashmolean
probable E.U.P.	13	thick nosed end-scraper	rhyolite	55	38	21	17.5	78.47 h/8	N.M.G.W.
probable E.U.P.	13	thick nosed end-scraper	flint	8	12	5	1.5	24.94/168	N.M.G.W.
probable E.U.P.	13	thick nosed end-scraper	flint	28	15	7	13.3	50.406/4	N.M.G.W.
probable E.U.P.	13	shouldered end-scraper	flint	32	28	9	8.8	s.343	O.U.M.
probable E.U.P.	13	shouldered end-scraper	flint	42	27	10	11.4	s.341	O.U.M.
probable E.U.P.	13	thick nosed end-scraper	chert	39	25	15	15	s.302	O.U.M.
probable E.U.P.	13	thick nosed end-scraper	flint	34	25	14	11.4	s.325	O.U.M.
probable E.U.P.	13	thick nosed end-scraper	rhyolite	47	30	17	23.3	s.334*	O.U.M.

ALL COLLECTIONS: LIST BY AGE OF ARTEFACTS.

DATE	TYPE	CLASSIFICATION	MATERIAL	L/mm	W/mm	Th/mm	W/g.	ACC. NO.	MUSEUM
probable E.U.P.	13	thick nosed end-scraper	rhyolite	40	26	34	66.1	s.336	O.U.M.
probable E.U.P.	13	thick nosed end-scraper	flint	45	30	15	18.1	s.339	O.U.M.
probable E.U.P.	13	thick nosed end-scraper	flint	36	32	13	3.2	s.371	O.U.M.
probable E.U.P.	13	thick nosed end-scraper (with "tang")	rhyolite	54	37	20	34.5	s.335*	O.U.M.
probable E.U.P.	14	flat nosed end-scraper	chert	14	11	10	3.2	1968.1733	Ashmolean
probable E.U.P.	14	flat nosed end-scraper	flint	34	21	3	4.2	1968.1692	Ashmolean
probable E.U.P.	14	flat nosed end-scraper	flint	22	20	9	3.5	1968.1696	Ashmolean
probable E.U.P.	14	flat nosed end-scraper	chert	46	23	7	10	1916 6-5:117	B.M.
probable E.U.P.	14	flat nosed end-scraper	rhyolite	29	24	11	12.7	24.94/265	N.M.G.W.
probable E.U.P.	14	flat nosed end-scraper	chert	49	26	8	1.8	24.94/139	N.M.G.W.
probable E.U.P.	14	flat nosed end-scraper	chert	37	26	6	5.9	24.94/140	N.M.G.W.
probable E.U.P.	14	flat nosed end-scraper	chert	24	35	6	6.4	24.94/218	N.M.G.W.
probable E.U.P.	14	flat nosed end-scraper	flint	40	25	8	7.8	24.94/145*	N.M.G.W.
probable E.U.P.	14	flat nosed end-scraper	flint	34	24	17	6.7	24.94/146*	N.M.G.W.
probable E.U.P.	14	flat nosed end-scraper	flint	40	37	17	24.4	24.94/221	N.M.G.W.
probable E.U.P.	14	flat nosed end-scraper	flint	32	28	12	10.5	24.94/264	N.M.G.W.
probable E.U.P.	14	flat nosed end-scraper	flint	54	21	9	9	24.94/270	N.M.G.W.
probable E.U.P.	14	flat nosed end-scraper	flint	39	25	10	0.3	60.96/7 .63	N.M.G.W.
probable E.U.P.	14	flat nosed end-scraper	flint	32	31	9	16.9	24.94/268	N.M.G.W.
probable E.U.P.	14	shouldered end-scraper	rhyolite	32	47	13	23.4	24.94/262	N.M.G.W.
probable E.U.P.	14	shouldered end-scraper	chert	25	20	7	4.3	24.94/17a	N.M.G.W.
probable E.U.P.	14	shouldered end-scraper	chert	34	37	14	6.2	24.94/260	N.M.G.W.
probable E.U.P.	14	shouldered end-scraper	flint	35	9	11	7.5	24.94/193b	N.M.G.W.
probable E.U.P.	14	shouldered end-scraper	flint	29	18	11	6.7	24.94/266	N.M.G.W.
probable E.U.P.	14	shouldered end-scraper	flint	22	29	7	7	24.94/355.140	N.M.G.W.
probable E.U.P.	14	flat nosed end-scraper	chert	49	31	17	27	s.293	O.U.M.
probable E.U.P.	14	flat nosed end-scraper	rhyolite	27	24	8	9	s.310	O.U.M.
probable E.U.P.	14	flat nosed end-scraper	flint	25	19	7	4.1	s.356	O.U.M.
probable E.U.P.	14	flat nosed end-scraper	flint	42	29	8	8.7	s.357*	O.U.M.
probable E.U.P.	15	core-like end-scraper	flint	66	24	43	118.7	1968.1721	Ashmolean
probable E.U.P.	17	end-scraper - burin (illustrated in: b59:4)	flint	–	–	–	–	836.1.22	Swansea
probable E.U.P.	69	bifacially worked piece (possible leaf point fragment)	flint	43	35	11	14.8	24.94/355.218	N.M.G.W.
Late Upper Palaeolithic	58	penknife point (broken)	flint	25	15	3	1	s.414	O.U.M.
Late Upper Palaeolithic	58	totally backed blade	flint	39	11	4	1	s.413	O.U.M.
Late Upper Palaeolithic	58	totally backed blade	flint	26	10	2	1	s.415	O.U.M.
Late Upper Palaeolithic	64	atypical "Cheddar Point'	flint	47	15	3	3	s.401	O.U.M.
Late Upper Palaeolithic	84	truncated bladelet	flint	49	13	4	2.7	24.94/28t	N.M.G.W.
Late Upper Palaeolithic	85	backed bladelet	flint	22	11	5	2	24.94/290	N.M.G.W.
Late Upper Palaeolithic	85	backed bladelet	flint	22	6	3	0.5	24.94/355.133b	N.M.G.W.
Late Upper Palaeolithic	85	backed bladelet	flint	32	10	4	1.9	24.94/291	N.M.G.W.
Late Upper Palaeolithic	85	backed bladelet (fragment)	flint	20	13	6	1.4	24.94/295	N.M.G.W.
Late Upper Palaeolithic	85	backed bladelet (fragment)	flint	20	11	4	14.9	24.94/396	N.M.G.W.
Late Upper Palaeolithic	85	backed bladelet (with retouched cortical edge)	flint	32	10	4	1.6	24.94/289	N.M.G.W.
Late Upper Palaeolithic	85	backed bladelet	flint	25	15	3	2.1	debitage 20	O.U.M.
Late Upper Palaeolithic	85	backed bladelet	flint	23	18	3	1.4	debitage 26	O.U.M.

APPENDIX IX: Analysis of Finds.

ALL COLLECTIONS: LIST BY AGE OF ARTEFACTS.

DATE	TYPE	CLASSIFICATION	MATERIAL	L/mm	W/mm	Th/mm	W/g.	ACC. NO.	MUSEUM
Late Upper Palaeolithic	93	debitage (steeply retouched piece)	flint	125	28	5	152	A909.1.37	Swansea
(Later) Mesolithic	2	atypical end-scraper (microlithic)	flint	24	22	4	0.7	24.94/255a	N.M.G.W.
(Later) Mesolithic	26	microlithic backed blade	flint	17	15	3	1.1	s.407	O.U.M.
(Later) Mesolithic	106	bladelet core	flint	20	15	10	4.6	24.94/355.163	N.M.G.W.
(Later) Mesolithic	106	bladelet core	flint	23	30	13	11.7	24.94/355.197	N.M.G.W.
(Later) Mesolithic	106	bladelet core fragment (on beach pebble)	flint	33	18	11	10.9	24.94/355.164	N.M.G.W.

Bibliography:

ADDINGTON, L. R. 1986. *Lithics Illustration.* University of Chicago Press.

ALDHOUSE-GREEN, S., PETTITT, P. & STRINGER, C. 1996. Holocene Humans at Pontnewydd and Cae Gronw Caves, *Antiquity* 70: 268 444-447.

ALDHOUSE-GREEN, S. 1997. The Paviland Research Project: the field assessment. *Archaeology in Wales* 37, 3-12.

ALDHOUSE-GREEN, S. & PETTITT, P. 1998 Paviland Cave: contextualising the "Red Lady". *Antiquity* 72 (178), 756-772.

ALLEN, E. E. & RUTTER, J. G. 1944. A Survey of the Gower Caves with an Account of Recent Excavations Part I *Proceedings of the Swansea Scientific and Field Naturalists' Society.* 2, 22-46. Part II. *Ibid.* 1947. 2, 263-290.

ALLSWORTH-JONES, P. 1986. *The Szeletian.* Oxford: Clarendon Press.

ANDERTON, R., BRIDGES, P. H., LEEDER, M. R., & SELLWOOD, B. W 1979. *A Dynamic Stratigraphy of the British Isles.* London Allen and Unwin.

ARMSTRONG, A. L. 1921. Pinhole Cave Excavations, Cresswell Crags, Derbyshire: Discovery of an Engraved Drawing of a Masked Human Figure. *Proceedings of the Prehistoric Society of East Anglia.* Vol. VI Part I.

ARMSTRONG, A. L. 1925. *Journal of the Royal Anthropological Institute* IV: 146.

ARMSTRONG, A. L. 1931. Excavations in the Pin Hole Cave, Creswell Crags, Derbyshire. *Proceedings of the Prehistoric Society of East Anglia.* Vol VI Part IV.

ARMSTRONG, A. L. 1932. *An Upper Aurignacian Station on the Lincolnshire Cliff.* Proceedings of the First International Congress of Prehistoric and Protohistoric Sciences; London.

ARMSTRONG, A. L. 1936. A Bull-Roarer of Le Moustier Age From Pinhole Cave, Creswell Crags, Derbyshire. *The Antiquaries Journal* XVI No. 3.

ARMSTRONG, A. L. 1939. Field Note Book Ash Tree Cave Excavations. Unpublished MS, Sheffield City Museum.

ARMSTRONG, A. L. 1949-1953. Field Note Book Creswell Crags Excavations, Unpublished MS, Sheffield City Museum.

BAHN, P. G. 1996. New Developments in Pleistocene Art. *Evolutionary Anthropology* Vol. 4 No. 6.

BALCH, H. E. 1914. *Wookey Hole, Its Caves and Cave-Dwellers.* Oxford University Press.

BALCH, H. E. 1928. Excavations at Wookey Hole and Other Mendip Caves 1926 - 1927. *The Antiquaries Journal* Vol. 8:193-211.

BARDON, L., & BOUYSSONIE, J. 1908. *Station Prehistorique de la Coimba-del-Bouittou, Près Brue, Corrèze.* Sull. Soc. Sci. Hist. Et Arch. de Corrèze 1907-1908. pp. 54.

BARKER, C. T. 1986. Ben and Maud Cunnington: the Gower connection. *The Wiltshire Archaeological and Natural History Magazine* 30, 232-234.

BARKER, H., BURLEIGH, R. & MEEKS, N. 1969. British Museum Natural Radiocarbon Measurements VI. *Radiocarbon* 11:289.

BARNES, B. 1982. *Man and the Changing Landscape.* Merseyside County Council & University of Liverpool Department of Prehistoric Archaeology.

BARTON, R N E., ROBERTS, A. J., ROE, D. A. 1991 *The Late Glacial in Northwest Europe.* C.B.A. Research Report No. 77.

BARTON, R.N.E., 1992. *Hengistbury Head, Dorset. Volume 2: The Late Upper Palaeolithic and Mesolithic Sites.* O.U.C.A. Monograph 34.

BARTON, R. N. E. & ROBERTS, A. J. 1996. Reviewing the British Late Upper Paleolithic: New Evidence for Chronological Patterning in the Lateglacial Record. *Oxford Journal of Archaeology* Vol. 15 No. 3 245-267.

BATES & JACKSON. 1980. *Glossary of Geology.* American Geological Institute, Falls Church, Virginia.

BELL, M. 1977. Excavations at Bishopstone, Sussex. *Sussex Archaeological Collections 115: 19-39.*

BHATTACHARAYA, D. K. 1977. *Palaeolithic Europe.* Humanities Press Atlantic Highlands.

BINANT, P. 1991. *Les Sepultures du Paleolithique.* Editions Errance.

BINFORD, L. R. 1979. Organization and Formation Processes: Looking at Curated Technologies. *Journal of Anthropological Research* 35: 255-73.

BINFORD, L. R. 1980. Willow Smoke and Dog's Tails: hunter-gatherer settlement and archaeological site formation. *American Antiquity* 45: 4-20.

BINFORD, L. R. 1983. *In Pursuit of the Past: Decoding the Archaeological Past.* London: Thames and Hudson.

BISHOP, M. J. (ed.) 1982. *The Cave Hunters.* Derbyshire Museums Service.

BORDES, F. 1968. *The Old Stone Age.* London: World University Library.

BOHMERS, A. & WOUTIERS, A. 1956. Statistics and Graphs in the Study of Flint Assemblages. *Palaeohistoria* V: 1-38.

BONSALL, C. 1974. *British Antiquity 1973-1974.* Palaeolithic - Mesolithic Archaeological Journal 131: 384-89.

BOSINSKI, G. 1990. *Homo Sapiens.* Editions Errance.

BOWEN, D. Q. 1970. The Palaeoenvironment of the "Red Lady" of Paviland, *Antiquity* 44: 134-6.

BOWEN, D. Q. 1980. *The Pleistocene Scenario of Palaeolithic Wales,* in Taylor, J. A. (ed.) *Culture and Environment in Prehistoric Wales.* B.A.R. 76.

BOWES, D. R. 1989. *The Encyclopaedia of Igneous and Metamorphic Petrology*. New York: Van Nostrand Reinhold.

BOYLAN, P. J. 1967. Dean William Buckland, 1784-1856. A Pioneer in Cave Science. *Studies in Spelaeology*. Vol. 1 (5), 237-253.

BOYLAN, P. J. 1981. The Role of William Buckland (1784-1856) in the Recognition of Glaciation in Great Britain, in J. Neale & J. Flenley (eds.), *The Quaternary in Britain*, 1-8. Pergamon Press.

BREUIL, H. 1912. *Les Subdivisions du Paléolithique Supérieur et Leur Signification.* Compte Rendu de la XIV^{e} Session, Genêve. Congrès International d'Anthropologie.

BREUIL, H. 1922. Observations on the Pre-Neolithic Industries of Scotland. *Proceedings of the Society of Antiquaries of Scotland* 56: 261-281.

BREZILLON, M. 1983. *La Denominations Objects de Pierres Tailles.* 4th Supplement for Galles Prehistories.

BRICKER, H. M. & DAVID, N. 1984. *Excavation of the Abri Pataud, Les Eyzies (Dordogne), The Perigordian VI (Level 3) Assemblage*. Cambridge M.A.: Harvard University Press.

BRICKER, H. M. (ed.) 1995. *Le Paléolithique Supérieur de l'abri Pataud.* Editions de la Maison des Sciences de l'Homme, Paris.

BRITISH MUSEUM. 1968, *Flint Implements*. London.

BRODRICK, A. H. 1963. *The Abbé Breuil, Prehistorian.* Hutchinson & Co. Ltd.

BUCKLAND , W. 1820 *Vindiciæ Geologicæ; or the connexion of Geology with Religion explained.* Oxford.

BUCKLAND, W. 1822. An account of an assemblage of fossil teeth and bones discovered in a cave at Kirkdale, Yorkshire. *Philosophical Transactions of the Royal Society of London* Vol. 122, 171-236.

BUCKLAND. 1823. *Reliquiae Diluvianae*. London: John Murray.

BURKITT, M. C. 1938. Description of a Flint Implement From a Digging in the Gravel of the Eastington Pit. *Proceedings of the Cotswold Naturalists' Field Club* XXVI (1): 296-7.

BURLEIGH, R. & MOLLESON, T. 1978. Goat's Hole cave; A Footnote. *Antiquity* Vol. LII No. 206: 236.

CAMPBELL, J. B. 1970. Excavations at Creswell Crags, Preliminary Report. *Derbyshire Archaeological Journal* Vol. LXXXIX 47-58. Derbyshire Archaeological Society.

CAMPBELL, J. B. & SAMPSON, C. G. 1971. *A New Analysis of Kent's Cavern, Devonshire, England.* University of Oregon Anthropological Papers No. 3.

CAMPBELL, J. B. 1977. *The Upper Palaeolithic in Britain- A study of Man and Nature in the Later Ice Age* Oxford: Clarendon Press. 2 Volumes.

CAMPBELL, J. B. 1986. Hiatus and Continuity on the British Upper Palaeolithic: A View from the Antipodes, in Roe, D.(ed.), *Studies in the Upper Palaeolithic of Britain and Northwest Europe.* BAR 296. Oxford University Press.

CAMPBELL, S. & BOWEN, D. Q. 1989. *Quaternary of Wales.* Geological Conservation Review.

CANNON, W. F. 1970. Buckland, William, in C. C. Gillespie (ed.), *Dictionary of Scientific Biography.* Scribner: New York, 566-572.

CATTELAIN, P., OTTE, M. & ULRIX-CLOSSET, M. 1986. Les Cavernes de l'Abime à Couvin. *Notae Praehistoricae* 6: 15-28.

CHAPELL, J., HEAD, J. & MAGEE, J. 1996. Beyond the Radiocarbon Limit in Australian Archaeology and Quaternary Research. *Antiquity* Vol. 70. No. 269: 543-53.

CHARLES, R. & JACOBI, R. M. 1994. Lateglacial faunal exploitation at the Robin Hood Cave, Creswell Crags. *Oxford Journal of Archaeology* 13(1): 1-32.

CHARLES, R. 1996a. *Butchery Evidence on the Faunal Remains from Paviland Cave, Rhosili, Dyfed, held in the National Museum and Galleries of Wales and Swansea Museum - Preliminary Report.* Unpublished MS.

CHARLES, R. 1996b. Back Into the North: The Radiocarbon Evidence for the Human Recolonisation of the North-Western Ardennes After the Last Glacial Maximum. *Proceedings of the Prehistoric Society* 62: 1-17.

CHARLES, R. 1996c. Evaluating the Northwestern European Upper Palaeolithic. *Antiquity* 70: 982-4.

CLARK, J. D. G. 1960. Excavations at the Neolithic Site at Hurst Fen, Mildenhall, Suffolk. *Proceedings of the Prehistoric Society* 26: 202-45.

CLIFFORD, E. M., GARROD, D., & GRACIE, H. S. 1954. Flint Implements from Gloucestershire. *Antiquaries Journal* 34 178-87.

COLLINS, D. 1986. *Palaeolithic Europe*. Clayhanger Books.

COULSON, S. D. 1990. *Middle Palaeolithic Industries of Great Britain.* Studies in Modern Archaeology Vol. 4. Bonn.

DALEAU, F. 1910. *Silex à Retouches Anormales.* Actes de la Société Archéologique de Bordeaux. tom. xxxi pp. 18.

DANIEL, G. E. 1950. *A Hundred Years of Archaeology*. London: Duckworth.

DARVILL, T. 1987. *Prehistoric Gloucestershire*. Alan Sutton.

DAVID, A. 1990. Palaeolithic and Mesolithic Settlement in Wales. Unpublished Ph.D. thesis, University of Lancaster.

DAVID, H. E. 1922. Diary. Unpublished MS in private possession.

DAVID, H. E. 1923. Burry Holmes. *The Royal Institution of South Wales, Swansea. Report of the Council for the Year 1922-23.* 29-30.

DAVIES, J. D. 1885. *A History of West Gower*, Vol. 3. Swansea: The Cambrian Office

DAVIES, M. 1989. Recent Advances in Cave Archaeology in South-west Wales, in T. D. Ford (ed.), *Limestones and Caves of Wales*, 79-92. Cambridge: University Press.

DAVIES, M. 1993. *The Caves of the South Gower Coast, an Archaeological Assessment.* Anne Oldham, Dyfed.

DAWKINS, W. B. 1874. *Cave Hunting.* London: Macmillan & Co.

DAWKINS, W. B. 1876. The Bone Caves of Creswell Crags. *The Quarterly Journal of the Geological Society*: 248-258.

DEBÉNATH, A. & DIBBLE, H. L. 1994. *Handbook of Paleolithic Typology, Vol. I.* University of Pennsylvania Museum.

DELPORT, H. 1984. *Le Grand Abri de Ferrassie, Fouilles 1968-1973.*

DEMARS, P-Y & LAURENT, P. 1989. *Types d'Outils Lithiques du Paleolithique Superieur en Europe.* Paris C.N.R.S. No. 14.

Derbyshire County Council and Nottinghamshire County Council. *Creswell Crags Seminar January 1986.*

DILLWYN, L. W. 1840. *Contributions towards a History of Swansea.* Swansea: Murray & Rees.

DREIMAN, R. N. 1979. Methods in Artefact Analysis: a Study of Upper Palaeolithic Burins. Contributions of the University of California Archaeological Research Facility No. 42.

EDMONDS, J. M. & Douglas, J. A. 1976. *William Buckland, F.R.S. (1784-1856) and an Oxford Geological Lecture, 1823.* Notes and Records of the Royal Society of London, Vol. 30, No. 2:141-167.

EL MANSOURI, M., EL FOUIKAR, A., SAINT-MARTIN, B. 1996. Correlation between ^{14}C Ages and Aspartic Acid Racemisation at the Upper Palaeolithic Site of the Abri Pataud. *Journal of Archaeological Science* 23: 803-809.

ENGLEHEART, G. H. 1910. On Neolithic Flints Lying Below the Present Surface at Dinton. *Wiltshire Archaeological and Natural History Magazine.* Vol. XXXVI.

ENGLEHEART, G. H. 1923. Surface Implements from Wiltshire. *Antiquaries Journal* 3: 144-145.

FAGNART, J-P & BOUCHER, A. 1991. Premier Approche Technologique sur ke Gisement Palaeolithique Final de Belloy-Sur-Somme, in A. Tuffreau (ed.), *Paléolithique et Mesolithique du Nord de la France.* Nouvelles Recherches II: 113-120.

FOSTER, I. LL. & DANIEL, G. 1965. *Prehistoric and Early Wales.* London: Routledge and Kegan Paul.

FREUND, G. 1952. *Die Blattspitzen des Paläolithikums in Europa.* Quartär Bibliothek, No. 1. Bonn.

GAMBIER, D. 1989. Fossil Hominids From the Early Upper Palaeolithic (Aurignacian) of France, in P. Mellars & C. Stringer (eds.), *The Human Revolution*: 194-211. Princeton: Princeton University Press.

GAMBLE, C. 1983. Culture and Society in the Upper Palaeolithic of Europe, in G. Bailey (ed.), *Hunter-Gatherer Economy in Prehistory*. Cambridge University Press.

GAMBLE, C. 1986. *The Palaeolithic Settlement of Europe*. Cambridge: Cambridge University Press.

GAMBLE, C. 1995. Lithics and Social Evolution, in Schofield, A. J. (ed.), *Lithics in Context*. Lithics Studies Society Occasional Paper No. 5.

GAMBLE, C. & LAWSON, A. J. (eds.) 1996. *The English Palaeolithic Reviewed*. Trust for Wessex Archaeology Ltd.

GAMBLE, C. 1996. Hominid Behaviour in the Middle Pleistocene: an English Perspective, in Gamble, C. & Lawson, A. J. *The English Palaeolithic Reviewed*: 63-71. Trust for Wessex Archaeology Ltd.

GARDINER, C. I. 1932. Recent Discoveries in the Stroud Valley. Proceedings of the Cotswold Naturalist's Field Club. Vol. XXIV Part III: 163-180.

GARROD, D. A. E. 1926. *The Upper Palaeolithic Age in Britain*. Oxford: Clarendon Press.

GARROD, D. A. E. 1946. *Environment, Tools and Man*. Cambridge University Press.

GEIKIE, J. 1914. *The Antiquity of Man in Europe*. Edinburgh: Oliver & Boyd.

GREEN, H. S. 1981. A Palaeolithic handaxe from Rhosili, Gower. *Bulletin of the Board of Celtic Studies* 29: 337-339.

GREEN, H. S. 1984a *Pontnewydd Cave: A Lower Palaeolithic Hominid Site in Wales - The First Report*. National Museum of Wales, Cardiff.

GREEN, H. S. 1984b. The Old and Middle Stone Ages, I: The Palaeolithic Period, in Savory, H. N. (ed.), *Glamorgan County History Vol. II*: 11-33. Cardiff: Glamorgan County History Trust Limited.

GREEN, H. S. 1988. Pontnewdd Cave: The Selection of Raw Materials for Artefact Manufacture and the Question of Natural Damage, in MacRae, R.J. & Moloney, N. (ed.), *Non-Flint Stone Tools and the Palaeolithic Occupation of Britain*. BAR 189. Oxford.

GREEN, H. S. 1989. The Stone Age Cave Archaeology of South Wales, in Ford, T. D. (ed.), *Limestones and Caves of Wales*. 70-78. Cambridge: Cambridge University Press.

GREEN, S. & WALKER, E. 1991. *Ice Age Hunters*. Cardiff: National Museums and Galleries of Wales.

GREEN, H. S. (et. al.) 1995. *Coygan Cave, Laugharne, South Wales, a Mousterian Site and Hyaena Den: a Report on the University of Cambridge Excavations*. Proceedings of the Prehistoric Society, 61: 37-79.

GRIMES W. F, & COWLEY, L .F. 1935. Coygan Cave, Llansadyrnin, Camarthenshire. *Archaeologica Cambrensis Vol. XC*.

GRIMES, W. F. 1939. *The Prehistory of Wales*. Cardiff: National Museum of Wales.

GRIMES, W. F. 1939. *Guide to the Collection Illustrating the Prehistory of Wales*. Cardiff: National Museum of Wales.

GVOZDOVER, M. 1995. *The Art of the Mammoth Hunters.* Oxbow Monograph 49.

HAESAERTS, P. & HEINZELIN, J.de. 1979. *Le Site Paléolithique de Maisières- Canal.* De Tempel Brugge.

HAHN, J. 1977. *Aurignacien das Ältere Jungpäolithikum in Mittle-Und Osteuropa.* Böhlau Verlag Köln Wien.

HARRISON, R. A. 1977. The Uphill Quarry Caves, Weston-Super-Mare, a Reappraisal. *Proceedings of the University of Bristol Spelaeological Society* 14 (3): 233-254.

HARROLD, F. B. 1980. A Comparative Analysis of Eurasian Palaeolithic Burials. *World Archaeology* 12: 196-211.

HART, C. R. 1981. The North Derbyshire Archaeological Survey to A.D. 1200. The North Derbyshire Archaeological Trust, Chesterfield. 17-21.

HEDGES, R. E. M, HOUSELEY, R.A., LAW, I.A., BRONK, C.R. 1989. Radiocarbon dates from the AMS system: Datelist 9, *Archaeometry* 31, 2 207-234.

HOWELLS, M. F., REEDMAN, A. J., & CAMPBELL, S. D. G. 1991. *Ordovician (Caradoc) Marginal Basal Volcanism in Snowdonia (North West Wales).* British Geological Survey.

HOWES, C. J. 1988. The Dillwyn Diaries 1817-1852, Buckland, and Caves of Gower (South Wales). *Proceedings of the University of Bristol Spelaeological Society* 18 (2), 298-305.

JACOBI, R. M. 1980. *Late Upper Palaeolithic Mesolithic Type List (Part 1).* Lithics Studies Society No. 2.

JACOBI, R. M. 1980. The Upper Palaeolithic of Britain with Special Reference to Wales, in Taylor, J. A. (ed.), *Culture and Environment in Prehistoric Wales.* BAR 76. Oxford.

JACOBI, R. M. 1986. The Contents of Dr. Harley's Showcase, in Collcutt, S. N. (ed.) *The Palaeolithic of Britain and its Nearest Neighbours.*

JACOBI, R. M. 1990. Leaf-points and the British Early Upper Palaeolithic, in Kozlowsi, J. K. (ed.), *Feuilles de Pierre.* Études et Recherches Archéologiques de l'Université de Liège. N°. 42.

JACOBI, R. M. 1991. The Creswellian, Creswell and Cheddar, in Barton, R. N. E. , Roberts, A. J., & Roe, D. A. (eds.), *The Late Glacial in North-West Europe: Human Adaptation and Environmental Change at the End of the Pleistocene.* London, Council for British Archaeology Research Report 77; 128-140.

JENKINSON, R. D. S. 1984. *Creswell Crags: Late Pleistocene sites in the East Midlands.* BAR British Series 122: Oxford.

JOCHIM, M. A. 1983. Palaeolithic Cave Art in Ecological Perspective, in G. Bailey (ed.), *Hunter-Gatherer Economy in Prehistory.* Cambridge University Press.

JONES, T. I. 1934. The Contributions of Welshmen to Science. *Transaction of the Society of Cymmrodion Session* 1932-1933: 101-7.

KNECHT, H. 1988. *Upper Palaeolithic Burins, Type, Form and Function.* BAR 434.

KNECHT, H., PIKE-TAY, A., WHITE, R. 1992. *Before Lascaux, the Complex Record of the Early Upper Palaeolithic.* C.R.C. Press.

KOSLOWSKI, J. & KOSLOWSKI, S. 1979. *Upper Palaeolithic and Mesolithic in Europe.* Varsovie: Polska Akademia Nauk.

KOSLOWSKI, J. 1986. *The Gravettian in Central and Eastern Europe,* Advances in World Archaeology 5. 131-200.

LALANNE, J.G. & BOUYSSONIE, J. 1946. Le Gisement de Laussel: Fouilles du Dr. Lalanne. *L'Anthropologie* 50: 1-163.

LARTET, E. & CHRISTY, H. 1875. *Reliquiæ Aquitanicæ: being contributions to the archaeology and palaeontology of Périgord and the adjoining province of Southern France.* London & Edinburgh: T. Rupert Jones.

LAURENT, P. & DEMARS, P.Y. 1989. *Types d'Outils Lithiques du Paléolithique.* C.N.R.S. 14. Paris.

LEACH, A. L. 1918. *Some Prehistoric Remains in the Tenby Museum.* Tenby and County News Office.

LEOTARD, J.-M. & OTTE, M. 1988. Occupation Paléolithique Final aux Grottes de Presle: fouilles de 1983-4 (Aiseau, Belgique), in M. Otte (ed.) *De la Loire à l'Oder: les Civilisations du Paléolithique Final dans le nord-ouest Européen.* BAR Internatioanl Series 444(1): 189-215.

LEROI-GOURHAN, A. & BRÉZILLON, M. 1972. *Fouilles de Pincevent: Vol I. Essai d'Analyse Ethnographique d'un Habitat Magalenénien.* VIIe Supplemént à Gallia Préhistoire. Centre National de la Recherche Scientifique.

LEWIS, C. A. *The Glaciations of the Brecknock Beacons, Wales.*

LUEDTKE, B. E. 1992. *An Archaeologist's Guide to Chert and Flint.* Archaeological Research Tools 7, UCLA.

MACENERY, J. 1859. *Cavern Researches, edited from the original manuscript notes by E. Vivian.* London.

MARSHALL, L. 1976. *The !Kung of Nyae Nyae.* Cambridge.

MARTINGELL, H. & SAVILLE, A. 1988. *The Illustration of Lithic Artefacts; A Guide to Drawing Stone Tools for Specialist Reports.* The Lithic Studies Society and the Association of Archaeological Illustrators and Surveyors. Northampton.

MAY, F. 1986. *Les Sépultures Prehistoriques.* Paris Editions du C.R.N.S.

McBURNEY, C. B. M. 1959. Report on the First Seasons Work on British Upper Palaeolithic Cave Deposits. *Proceedings of the Prehistoric Society* 25: 143-5.

McCOMB, P. 1989. *Upper Palaeolithic Osseous Artifacts from Britain and Belgium.* BAR 481. Oxford.

MELLARS, P. 1969. Radiocarbon Dates for a New Creswellian Site. *Antiquity* 43: 308-10.

MELLARS, P. & STRINGER, C. 1989 (eds.) *The Human Revolution*. Princeton University Press.

MELLARS, P. 1992. Archaeology and the Population-dispersal Hypothesis of Modern Human Origins in Europe. *Philosophical Transactions of the Royal Society of London* 337: 225-234.

MELLARS, P. 1996 *The Neanderthal Legacy: An Archaeological Perspective from Western Europe*. Princeton: Princeton University Press.

MELLO, J. M. 1876. The Bone-Caves of Creswell Crags. *Quarterly Journal of the Geological Society*.

MOIR, J. R. 1927. *The Antiquity of Man in East Anglia*. Cambridge: Cambridge University Press.

MORGAN, W. LL. 1910. *Royal Institute of South Wales Reports* 1909-1910: 24. Swansea

MORGAN, W. L. 1913. Bacon Hole, Gower. *Archaeologica Cambrensis* 13, 173-180.

MORTILLET, G. De 1872. Classification des diverses périodes de l'âge de la pierre. *Congrès international d'Anthropologie et d'Archéologie préhistoriques*.6 Bruxelles, 432-459.

MOUNTON, P. & JOFFROY, R. 1958. *Le Gisement Aurignacien des Rois a Mouthiers (Charente)*. IX[e] Supplément à Gallia Préhistoire. Centre National de la Recherche Scientifique.

MOVIUS, H. L. & JUDSON, S. 1956. *The Rock-Shelter of La Colombière*. Peabody Museum, Harvard University Bulletin No. 19.

MOVIUS, H. L. 1975. *Excavation of the Abri Pataud, Les Eyzies*. Harvard University.

MURCHISON, C. 1868. *Palaeontological Memoirs and Notes of the late Hugh Falconer*. Robert Hardwicke, London.

NORTH, F. J. 1942. *Paviland Cave, The "Red Lady", The Deluge, and William Buckland*. Annals of Science, Vol. 5. No. 2: 91-128.

NORTH, F. J. 1966. The "Red Lady" of Paviland, in S. Williams *Glamorgan Historian* Vol. 3. Cowbridge: D. Brown & Sons Ltd.

OAKLEY, K. P. 1968. *The Date of the "Red Lady" of Paviland*. Antiquity 42: 306-307.

OAKLEY, K. P., CAMPBELL, B. G. MOLLESON, T. 1971. *Catalogue of Fossil Hominids (Part II: Europe)*. London.

OAKLEY, K.P. 1980. *Relative Dating of the Fossil Hominids of Europe*. Bulletin of the British Museum (Natural History) Geology Series Vol. 34 No. 1:30.

OTTE, M. 1977. Deux Coquilles, Probablement d'Origine Anglaise, Découverts à Spy, Belgique, in J. Campbell, *The Upper Palaeolithic in Britain* Vol I: Appendix III.

OTTE, M. 1984. Paléolithique Supérieur en Belgique, in Cahen, D & Haesaerts, P. *Peuples Chasseurs de la Belgique Préhistorique dans Leurs Cadres Naturel. Bruxelles:* 157-197.

OTTE, M. (ed.) 1988. *De La Loire à L'Oder: Les Civilisations du Paléolithic Final dans le Nord- Ouest Européen*. BAR International Series 444(I).

OTTE, M. 1990 The Northwestern European Plain Around 18 000 BP, in Soffer, O. & Gamble, C. *The World at 18 000 BP* Vol I: 54-68. London: Unwin Hyman.

PALMER, K. 1993. *Surface Flint Finds in the Black Mountains Area and their Relevance to Prehistoric Settlement.* Unpublished MS.

PALMER, S. 1970. The Stone Age Industries of the Isle of Portland, Dorset, and their Utilisation of Portland Chert as Artifact Material in Southern England. *Proceedings of the Prehistoric Society* 36: 85-115.

PRICE & BROWN 1985 *Prehistoric Hunter-Gatherers.*

Proceedings of the Cotswold Naturalist's Field Club 1934. Notes XXV Part II: 209.

QUINNELL, H., BLOCKLEY, M. R., BERRIDGE, P. 1994. *Excavations at Rhuddlan, Clwyd 1969-1973, Mesolithic to Medieval.* CBA Research Report 95.

RANDALL, H. J. & REES, W. (eds.) 1963. *Diary of Lewis Weston Dillwyn (Transcript).* South Wales and Monmouthshire Record Society Publications No. 5. Newport: R. H. Johns Ltd.

REID MOIR, J. 1938. Four Flint Implements. *Antiquaries Journal* 18. 258 - 261.

ROE, D. A. 1968. *British Lower and Middle Palaeolithic Handaxe Groups.* Proceedings of the Prehistoric Society Vol 34: 1-82.

ROE, D. A. 1981. *The Lower and Middle Palaeolithic Periods in Britain.*

ROE, D. A. (ed.) 1986. *Studies in the Upper Palaeolithic of Britain and Northwest Europe.* BAR International Series 296.

ROEBROEKS, W. 1996. The English Palaeolithic Record: Absence of Evidence, Evidence of Absence and the First Occupation of Europe, in Gamble, C. & Lawson, A. J. *The English Palaeolithic Reviewed*: 57-62. Trust for Wessex Archaeology Ltd.

ROWLANDS, B. M. 1971. Nature Phys. Sci. 230:9.

ROYAL INSTITUTE OF SOUTH WALES 1898 *Catalogue of Antiquities.*

ROYAL INSTITUTE OF SOUTH WALES 1899 *Catalogue of Anthropological Specimens.*

ROYAL INSTITUTE OF SOUTH WALES 1910 *Catalogue of Antiquities.*

ROYAL INSTITUTE OF SOUTH WALES 1912 *Catalogue of Antiquities.*

ROYAL INSTITUTE OF SOUTH WALES 1913 *Catalogue of Antiquities.*

ROYAL INSTITUTE OF SOUTH WALES 1920 *Catalogue of Antiquities.*

Royal Commission on Ancient Monuments in Wales and Monmouthshire. 1917. County of Camarthen: Parish of Llansadyrnin. 184-186.

RUTTER, J. G. 1948. *Prehistoric Gower.* Welsh Guides, Swansea.

RUTTER, J. G. & ALLEN, E. E. 1948. *Gower Caves.* Swansea.

RUTTER, J. G. 1949. *Prehistoric Gower (second edition).* Swansea, Welsh Guides.

SACKETT, J. 1977. The Meaning of Style in Archaeology. *American Antiquity* 42.

SAVILLE, A. 1980. Five Flint Assemblages from Excavated Sites in Wiltshire. *Wiltshire Archaeological Magazine 72/73.*

SAVILLE, A. 1984. Archaeology in Gloucester. Cheltenham.

SAVORY, 1940. *Archaeologica Cambrensis* Vol 95: 84.

SAVORY, H. N. (Ed.) 1951. *The Prehistory of Wales.* Cardiff: National Museum of Wales.

SCHOFIELD, A. J. (E d.) 1995. *Lithics in Context.* Lithics Studies Society Occasional Paper No. 5.

SIBLEY, T. F. 1919. *Iron Ores- the Haematites of the Forest of Dean and South Wales.* London: Memoirs of the Geological Survey Vol. X.

SIEVEKING, 1981. A Visit to Symond's Yat. *Antiquity* 55: 123-5.

SIMPSON, B. 1996. An Analysis of the Mesolithic Body Adornment From the Scottish Western Isles, in Pollard, T & Morrison, A. *The Early Prehistory of Scotland.* Edinburgh University Press.

SMITH, C. 1992. *Late Stone Age Hunters of the British Isles.* Routledge.

SMITH, R. A. 1912 *On the Classification of Palaeolithic Stone Implements.* Proceedings of the Geologists's Association. Vol. XXIII: 137-148.

SOFFER, O. & GAMBLE, C. 1990. *The World at 18 000 BP.* London: Unwin Hyman.

SOLLAS, W .J. 1911. *Ancient Hunters.* London.

SOLLAS, W. J. 1913. *Paviland Cave: An Aurignacian Station in Wales.* Royal Anthropological University Press.

SONNEVILLE- BORDES, D de. 1960. *Le Paléolithique Supérieur en Périgord.* Bordeaux, Imprimeries Delmas.

SONNEVILLE-BORDES, D. de & PERROT, J. 1954. Lexique Typologique du Paléolithique Supérieur. Outillage Lithique. *Bulletin de la Société Préhistorique Française.* Vol 51:327-335.

SPARKS, B. W. & WEST, R. G. 1972. *The Ice Age in Britain.*

STINER, M. 1991. The Faunal Remains at Grotta Guattari, a Taphonomic Perspective. *Current Anthropology* 32: 103-117.

STRAHAN, A. 1907. *The Geology of the South Wales Coal Field Part IX: West Gower and the Country Around Pembrey.* Memoirs of the Geological Survey 246.

STRAUS, L. G. 1995. The Upper Paleolithic in Europe, an Overview, *Evolutionary Anthropology* 4: 4-15.

STRAUS, L. G. (et. al.) (eds.) 1996. *Humans at the End of the Ice Age.* New York: Plenum Press.

STRAW, A. 1996. The Quaternary Record of Kent's Cavern - A Brief Reminder and Update. *Quaternary Newsletter* 80: 17-25.

STRINGER, C. B., CURRANT, A. P., SCHWARCZ, H. P., COLLCUTT, S. N. 1986. Age of Pleistocene Faunas from Bacon Hole, Wales. *Nature* 320 59-62.

STRINGER, C. & McKIE, 1996. *African Exodus.* Jonathan Cape, London.

SWANSEA PHILOSOPHICAL AND LITERARY INSTITUTION 1836. *Report.*

SWANSEA PHILOSOPHICAL AND LITERARY INSTITUTION 1837, *Report.*

THOMAS, W. V. 1976. *Portrait of Gower.* Robert Hale, London.

TORRENCE. 1983. Time Budgeting and Hunter-Gatherer Technology, in G. Bailey (ed.), *Hunter-Gatherer Economy in Prehistory.* 11-23.

TOUSSAINT, M. (ed.) 1992 *Cinq Millions d'Années, l'Aventure Humaine.* Etudes et Reherches Archéologiques de l'Université de Liège, No. 56.

TRINKHAUS, E. & SHIPMAN, P. 1993. *The Neanderthals.* London: Pimlico.

TURNER, A. 1996. *The Paviland Cave Vertebrate Assemblage.* Unpublished MS.

University of Oxford Ashmolean Museum. 1948. *Report of the Visitors.* Oxford University Press.

VAN NOTEN. 1978. *Les Chasseurs de Meer.* Dissertations Archaeologique Gandensis Vol. 18.

VAN NEDERVELDE, B R. J., DAVIES, M., JOHN, B. S. 1973. Radiocarbon dating from Ogof-yr-Ychen, a New Pleistocene Site in West Wales. *Nature* Vol. 245: 453-454.

VITA-FINZI, C. & HIGGS, E. S. 1970. Prehistoric Economy in the Mount Carmel Area of Palestine: Site Catchment Analysis. *Proceedings of the Prehistoric Society* 36: 1-37.

WEISSNER, P. 1983. Style and social information in Kalahari San projectile points. *American Antiquity* 48:253-276.

Wells Natural History and Archaeological Society. 1971. *Fourteen Years at the Badger Hole. From the Diaries of H. E. Balch 1938-1952.*

WHITTEN, D. G. A. & BROOKS, J. R. V. 1972. *The Penguin History of Geology.* Penguin.

WHITTLE, A. & WYSOCKI, M. 1998. Parc le Breos Cwm Transepted Long Cairn, Gower, West Glamorgan: date, contents and context. *Proceedings of the Prehistoric Society* 64, 139-182.

WILLIAMS, D. 1831. *Proceedings of the Royal Society* Vol. 3 No. 5: 55-7.

WILLIAMS, M. A. J., DUNKERLEY, D. L., DE DECKKER, P., KERSHAW, A. P., STOKES, T. J. 1993. *Quaternary Environments.* Arnold.

WILSON, E. & REYNOLDS, S. H. 1901. *Proceedings of the Bristol Natural History Society* 9 (3): 156-160.

WOBST, H. M. 1977. Stylistic Behaviour and Information Exchange, in C. E. CLELAND (ed.), *Papers for the Director: Research Essays in Honor on James B. Griffin.* Anthropological Papers, Museum of Anthropology, University of Michigan 61: 317-342.

WYMER, J. J. & BONSALL C.J. (eds). 1977. *Gazetteer of Mesolithic sites in England and Wales.* CBA Research Report No. 20.

WYMER, J.J. 1984. East Anglian Palaeolithic Sites and Their Settings, in Ashbee et. al. (eds.) *Aspects of East Anglian Pre-history.*