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MUSEUM NOTE 1985

A RED DEER ANTLER MATTOCK FROM WILLINGTON QUAY, WALLSEND*

Christopher Smith and Clive Bonsall

Fig. 1, Plate XIII

THE IMPLEMENT that forms the subject of this note was donated to the Society of Antiquaries of Newcastle upon Tyne in July 1934 by a Mr. Laverick of Willington Quay.[1] It is said to have been found at Willington Quay but no further details of its findspot or of the circumstances of its discovery are recorded.

The topography of Willington Quay, and that of the adjoining areas of the lower Tyne, has been greatly altered by the dumping of ballast brought north by colliers returning from the Thames. This, and the fact that the largest group of comparable implements known in Britain comes from the Thames Valley, has led to the view that the Willington Quay implement may have been derived from a load of such ballast.[2] According to the Ordnance Survey Record Card (NZ36NW11), dated 28/12/1951, a note then accompanying the implement in the Black Gate Museum gave a ship's ballast as a possible provenance, although the Thames was not specifically mentioned. The original note is now missing.

With this problem over the provenance of the implement in mind in 1968 the Keeper of the Museum of Antiquities, Dr. D. J. Smith, invited Dr. D. A. Robson (then of the Department of Geology, University of Newcastle upon Tyne), to comment on a small sample of material scraped from between the grooves of the antler. Dr. Robson commented as follows: "The sample consists predominantly of grains of quartz (some of the larger grains being extremely well rounded) together with a few tourmalines and a certain amount of iron ore. The only negative observation I can make is that one could have expected a greater variety of minerals from a Thames silt or sand, but this is too tenuous to make anything like a firm observation."

The evidence for a Thames provenance is therefore inconclusive and circumstantial, but quite plausible nonetheless. The closest parallel for the implement is one found at New Scotland Yard in 1937 and now in the London Museum (acc. no. 49.85).[3]

Description

The Willington Quay implement is made out of the basal portion of an unshed red deer antler. It has been examined by James Rackham of the Biological Laboratory, Department of Archaeology, University of Durham, and his comments are reproduced below as an appendix to this note. The implement weighs approxim-

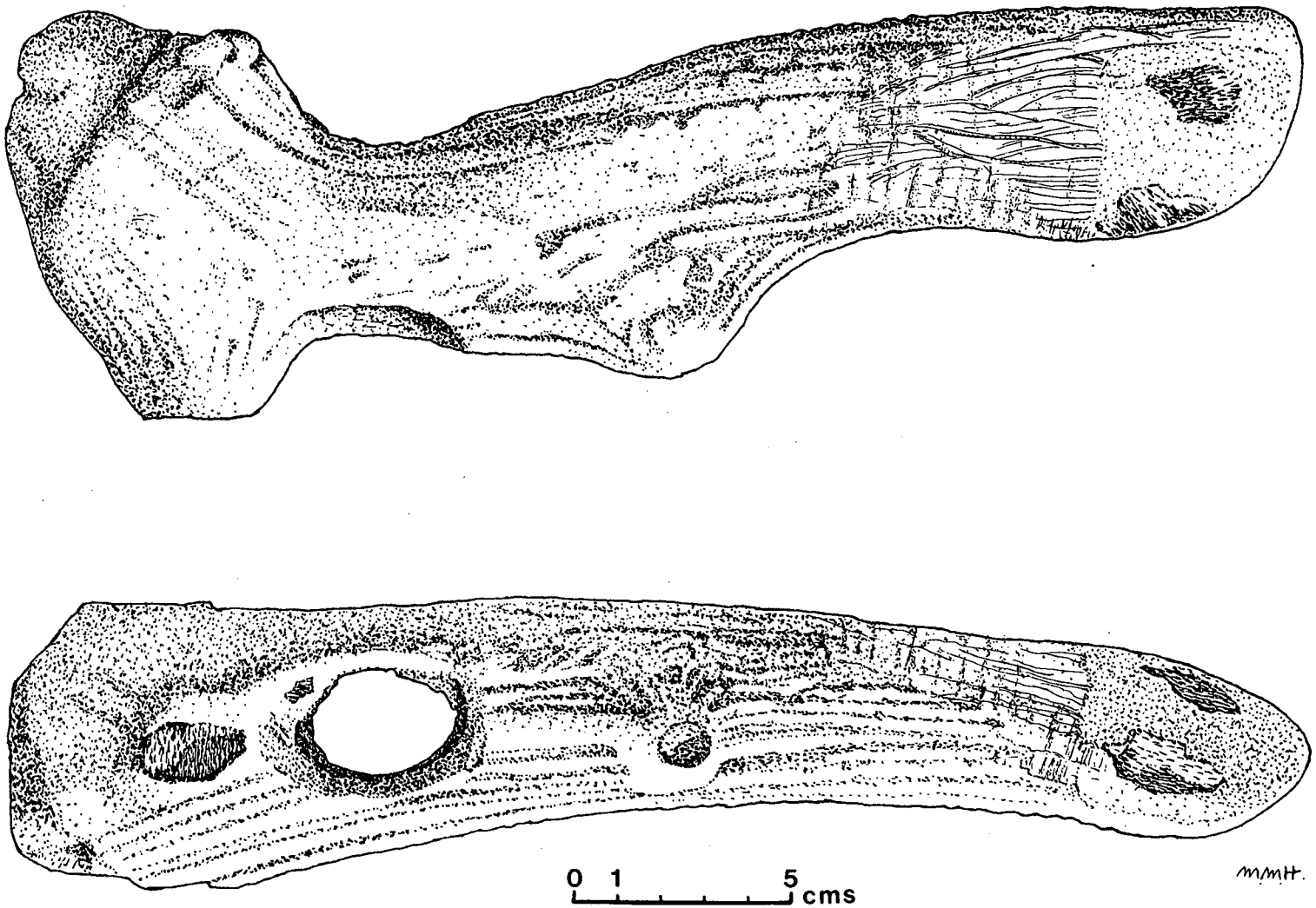

Fig. 1. Antler mattock from Willington Quay.
Drawn by Mary M. Hurrell.

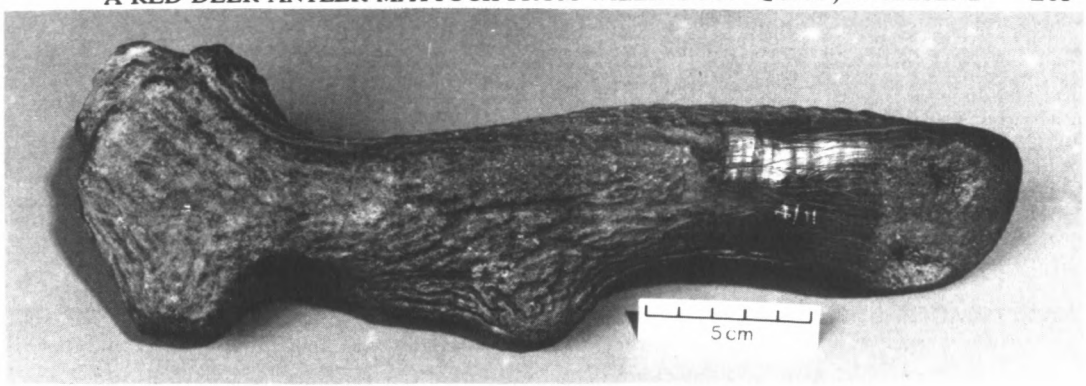

Plate XIII. Upper: antler mattock from Willington Quay.
Lower: detail of facet.
Photography: University of Newcastle upon Tyne.

ately 850 grammes and is 290 mm long. It has an oval shaft-hole 30×25 mm between the stumps of the brow and bez tines. The beam of the antler has been truncated obliquely 150 mm above the bez tine to form a cutting edge at about 30° from the axis of the shaft-hole. The truncation has left a broad facet 105 mm long. This facet exhibits a number of interesting features relating to the manufacture and use of the implement. In the former category are a series of faint corrugations running at right angles to the long axis of the facet. These are characteristic *chatter marks* produced by shaving the surface of the antler with a sharp-edged implement to create a smooth working face. Cutting across these at right angles are a large number of roughly parallel striations of varying depth. Many of these are slightly convex towards what would have been the underside of the beam, and were almost certainly caused by the use to which the implement was put. For the final 50 mm of the facet the inner cancellous tissue of the antler has been exposed by the truncation. The harder portions of the facet, partcularly around the tip which is itself quite blunt and rounded, display a fine lustrous polish which is also probably the result of abrasion during use. This wear polish has tended to remove the striations nearer the tip. The implement therefore has two distinct wear patterns—striations and polish—possibly related to different episodes of use. The tines appear to have been removed by the nibbling technique first identified by Clark on implements from Star Carr[4] and noticed by him on worked antlers from Scottish sites.[5] There are also signs that attempts were made to reduce the pedicle by cutting grooves around its circumference and then paring away surplus material.

The implement is a fine example of an *antler-base mattock* of the type described by Clark[6] and is to be distinguished from implements made from the central portion of the beam in which the shaft-hole is usually made through the stump of the trez tine. These are known by various terms—*antler-beam mattocks, socketed mattock-heads* or *T-shaped antler axes.* Clark illustrates several examples.[7]

The term antler mattock is used here in preference to antler axe for the following reasons. Firstly, the shape of the implement is quite unsuitable for an axe, being far longer than necessary. This would have made it poorly balanced and awkward to use for chopping purposes. Secondly, the use wear exhibited by the implement seems more consistent with its having functioned as a digging tool. The wear polish around the top could have resulted from digging in fine soft material with a high organic content; while the striations on the facet correspond closely to those described by Semenov[8] on pick- and mattock-type implements of bone, walrus ivory and antler and attributed by him to wear caused by digging in gritty soil. It is difficult to envisage how such striations could have been caused had the implement been used primarily for woodworking.

The distinct curve of many of the striations and the angle of the cutting edge suggest that the Willington Quay mattock was hafted with the stumps of the tines pointing downwards and used in a wide swinging motion. Implements of this kind rarely survive with their hafts intact but an example, now lost but originally from Hammersmith, was found with a long wooden handle of pickaxe proportions.[9]

Affinities

In Britain two groups of antler mattocks offer comparisons with the Willington Quay implement, one from the Thames Valley and now housed mainly in the London Museum and the British Museum and another from Scotland. Although individual items from the Thames Valley had been published previously,[10] Lacaille was the first to draw attention to the group as a whole and illustrated several examples.[11] A recent examination by one of us (C.S.) of the collection in the London Museum identified twenty-four antler-base mattocks about half of which exhibited wear patterns comparable with those of the Willington Quay mattock. This collection also includes over twenty other antler-base shaft-hole implements which cannot certainly be classified as mattocks and a number of antler-beam implements. Attention has already been drawn to the antler-base mattock from New Scotland Yard. This is illustrated by Lacaille[12] and provides the best parallel for the Willington Quay implement, although it is somewhat shorter.

Most antler mattocks from Scotland are of the antler-beam type and some examples have been published by Clark.[13] The best known is the fine complete specimen from Meiklewood in the Carse of Stirling.[14] The Meiklewood mattock is one of a number of antler and bone implements found in association with the skeletons of stranded whales incorporated in the *carse clay*.[15] A comparable antler-beam mattock is known from the midden on the island of Risga in Loch Sunart.[16] This piece is incomplete, and another broken implement apparently of this type is reported from the Druimvargie Rockshelter, Oban.[17] Three substantially complete examples have been recovered from the sites of Cnoc Coig, Cnoc Sligeach and the Priory Midden on the island of Oronsay.[18]

Outside Britain both antler-base and antler-beam mattocks are known in considerable numbers from southern Scandinavia[19] and examples of the latter type occur widely throughout northern Europe.

Date

Although shaft-hole implements of red-deer antler are known from most periods of British prehistory antler mattocks appear to be a specifically Mesolithic type. No specimen has been directly dated and there are few useful archaeological associations. The Risga, Oronsay and Druimvargie Rockshelter mattocks are each associated with assemblages of Late Mesolithic *Obanian* type, the Oronsay sites having radio-carbon dates in the range 3,700–3,400 b.c.[20]

The carse clay of the Forth Valley was deposited during the Main Post-Glacial Transgression and subsequent regression, carse deposition commencing around 6,500 b.c. The surface of the carse is diachronous, the age depending on the period of abandonment of the relevant shorelines.[21] In the Meiklewood locality the date of cessation of carse deposition may be estimated as prior to 2,170±105 b.c.[22] However, since the Meiklewood implement was reported as having been found *within* the carse, its age can only be bracketed between *circa* 6,500–2,170 b.c., although on purely typological grounds it is unlikely to be older than 4,000 b.c.

The only direct evidence for the age of the antler mattocks from the Thames

Valley is provided by a pollen sample from soil adhering to an antler-base implement from Kew Bridge.[23] Lacaille, very tentatively, took this to indicate a late Boreal (Zone VI) date for its deposition. Such a date, in the seventh millennium or the first half of the sixth millennium b.c., would place this implement somewhat earlier than the antler-beam mattocks from Scotland.

In southern Scandinavia mattocks made of red-deer antler are found throughout the greater part of the Mesolithic sequence. Antler-base mattocks probably came into use around 7,000 b.c. superseding forms made of elk antler, and were replaced by the antler-beam type at the beginning of the Younger Ertebølle phase around 3,500 b.c., a change which is documented stratigraphically at sites such as Ringkloster[24] and Tybrind Vig.[25] The abruptness of this change in Denmark suggests that the two types fulfilled essentially the same function. Further south on the North European Plain antler-beam mattocks appear rather earlier in the fourth millennium b.c. and are known from both Ertebølle[26] and Neolithic sites.[27] It is perhaps worth noting that amongst the Danish material the closest parallels for the Willington Quay mattock are to be found in Older Ertebølle contexts.

Summary and Conclusions

In summary it may be concluded that the Willington Quay implement is an antler-base mattock of Mesolithic type. Evidence from the north European mainland suggests that implements of this kind first came into use early in the Mesolithic period and continued to be made until replaced by antler-beam mattocks in the first half of the fourth millennium b.c. In the absence of radio-carbon determinations or of reliable archaeological associations for this type of implement it is impossible to be more precise about its age. Morphologically it corresponds quite closely to a series of implements found in the Thames Valley and the possibility remains that the Willington Quay mattock may have come from that part of the country originally. It bears rather less resemblance to the implements found in Scotland, which are mostly of the antler-beam type, although it must be said that the contrast between the Scottish finds and those from the Thames probably reflects chronological rather than geographical factors. A local parallel may be provided by an implement of antler found on the banks of the River Tees during the construction of the North Tees Power Station at Billingham.[28] Though this has never been fully published and is now lost, one of us (C.B.) was recently able to examine a cast in the British Museum (Natural History). From this it appears that the original Billingham implement, although differing in some details, did have a shaft-hole between the brow and bez tines in the manner of the Willington Quay mattock.[29]

The likelihood is that the Willington Quay mattock was used as some form of digging implement. As all the British examples of antler mattocks appear to come from coastal or riverine situations the activity in question may have been specifically related to the foreshore or river bank although it has to be admitted that this distribution may have as much to do with factors of preservation as it does with the function of the implements themselves. The fact that the implement from

Meiklewood in the Forth Valley was found with the skeleton of a stranded whale has led to the suggestion that antler mattocks were used for removing blubber in the manner of flenching knives.[30] However, the stranding of whales must have been a comparatively rare and entirely adventitious event and is unlikely to have generated a specific type of tool. Moreover it is difficult to see how the removal of blubber and soft tissue from whale carcasses could account for the wear patterns noted on the Willington Quay mattock. Probably antler mattocks were general-purpose implements which proved suitable for flenching when the need arose.[31]

APPENDIX: THE WILLINGTON QUAY ANTLER ARTEFACT

James Rackham

The artefact has been manufactured from an antler of large size. Since it is known that the size of red deer antlers has decreased during the post-glacial period up to modern times it was felt that its size and morphology might permit at least a tentative assignment to a period.

This study has been made considerably simpler by the publication of a biometric study of the red-deer antler-picks from Grimes Graves, Norfolk and Durrington Walls.[32] This study has considered a large number of antler picks from these two Neolithic sites the majority of which were manufactured from the antlers of adult individuals. Its author took up to fifteen measurements on these specimens and has published the distribution with the mean size and standard deviations for each measure from both sites. The Willington Quay specimen is unfortunately both damaged by the manufacturing process and later use and burial. This has prevented the precise measurement of any of those dimensions utilized by the author of the study just mentioned. Nevertheless an estimate with a fairly limited potential error can be obtained for one or two of the dimensions.

The surviving anterior-posterior diameter of the burr of the Willington Quay specimen is 75 mm.[33] This has however been broken and considerably abraded and an estimate for its original dimension has been determined by considering the diameter of the beam immediately above the burr in relation to the burr diameter in whole prehistoric specimens and a factor produced to correct for the damage. This produces an estimate of burr-diameter of 90 mm with an unspecified error but unlikely to be as much as 10%. A second dimension that can be estimated with a little more confidence is the distance from the base of the brow tine to the distal base of the bez tine.[34] In the Willington specimen this is estimated to be 150 mm. Further dimensions might be measured but would be subject to potentially larger errors.

A comparison of these two dimensions with the data from Grimes Graves and Durrington Walls indicates that this specimen is extremely large. The mean diameter of the burr at Grimes Graves is 68·3 mm and that at Durrington Walls 65·1 mm. The abraded diameter of the Willington Quay specimen is much larger

than this and the estimated figure is greater than any of the 320 measured specimens from Durrington Walls and is only matched by a single specimen from Grimes Graves. The second dimension, base of brow tine to distal base of bez, is also extremely large and is matched by only one specimen from Grimes Graves. We may therefore suggest that despite the abrasion and errors incorporated within the estimates the Willington Quay specimen is larger than all but one or two specimens of the Grimes Graves collection which it has been suggested were made by "professional" miners from selected large uniform-sized adult antlers.[35]

There is no comparable large body of data from later periods of British prehistory and it seems unlikely that any but the most exceptional animals from later periods would produce antlers of this size. With respect to earlier periods the only collection of note is that from the Mesolithic site at Star Carr.[36] Unfortunately the only published data relates to the pedicle circumference, a measure that could not be taken on many of the antler picks because they had been naturally shed or abraded and is not therefore recorded by Clutton-Brock.[37] Although the specimen from Willington Quay is from an unshed antler the base is very abraded, and while we can again produce an estimate of the pedicle circumference this is likely to be subject to a larger degree of error than the other two dimensions estimated. The pedicle diameter has been estimated at approximately 160 mm which is in the upper part of the range found by Frazer and King in the material from Star Carr.[38]

While the assignment of an animal to a period on the basis of size must be viewed as a somewhat suspect method of dating an artefact, the fact that only the very largest specimens from the late Neolithic sites at Grimes Graves and Durrington Walls approach the size of the Willington Quay specimen, and also that this occurs in the upper range of the much earlier Mesolithic material from Star Carr, would suggest an earlier rather than later prehistoric date for the specimen. This cannot be viewed as proven by any means but it does lend support to the other archaeological data suggesting a Mesolithic date for the specimen.

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NOTES

* Prepared for the press by Dr. D. J. Smith, with grateful acknowledgement to the writers.

[1] *PSAN*[4] VI, 1933–34 (1935), 286.

[2] Wymer, 1977, 221.

[3] Lacaille, 1961, 134, 136, fig. 7.3.

[4] Clark, 1954, 136.

[5] Clark, 1956, 94–98.

[6] Clark, 1975, 171, 181, 183.

[7] Clark, 1975, 184, fig. 50.

[8] Semenov, 1964, 179–83.

[9] Lawrence, 1930, Plate VIIIb facing page 86.

[10] Lawrence, 1930.

[11] Lacaille, 1961.

[12] Lacaille, 1961, 136, fig. 7.3.

[13] Clark, 1956.

[14] Clark, 1956, 95, fig. 2.

[15] Lacaille, 1954, 169–75, fig. 64.

[16] Clark, 1956, 94, fig. 1.

[17] Lacaille, 1954, 208.

[18] Clark, 1956, 95, fig. 3; unpublished information from Dr. Paul Mellars.

[19] Clark, 1975.

[20] Mellars, 1978, 376, Table 1; unpublished information from Dr. Paul Mellars.

[21] Smith, 1968.

[22] Sissons and Brooks, 1971, site 7.

[23] Lacaille, 1961, 133.

[24] Andersen, 1974.

[25] Andersen, 1984, 316.

[26] Schwabedissen, 1980.

[27] Clark, 1975, 184, fig. 50.

[28] Wymer, 1977, 78.

[29] This implement is to be the subject of a further publication.

[30] Turner, 1890, 791.

[31] The authors would like to thank Søren Andersen, Andrew Foxon, Jean MacDonald, Paul Mellars, James Rackham, Donald Sutherland and Hilary Wade for their advice and assistance, Mary Hurrell for drawing the implement and David Smith for inviting us to prepare this note.

[32] Clutton-Brock, 1984.

[33] *Id.*, measure 2, fig. 3.

[34] *Id.*, measure 15, fig. 3.

[35] *Id.*

[36] Fraser and King, 1954.

[37] Clutton-Brock, *op. cit.*

[38] Fraser and King, *loc. cit.*