

I. INTRODUCTION

1. GENERAL OBSERVATIONS

In no domain of prehistoric inquiries have greater advances been made during the past thirty-five years than in that concerned with man in the stages of his Mesolithic, or Middle Stone Age, cultural development in western Europe including these islands. Upon many archaeologists certain implements of types first produced abundantly in developed Mesolithic industries have exerted a peculiar fascination. In this regard one thinks especially of the small stone artifacts called microliths. So infectious has proved the attractiveness of these objects that for many enthusiastic workers this label and the term Mesolithic are virtually synonymous. This at least partly explains why of late years no word in the prehistoric nomenclature has come to be more freely used. Indeed, for several collectors of surface-found stone implements it describes specimens that bring to mind forms illustrated in textbooks to represent Middle Stone Age industry. For instance, some recent finds in north-west Middlesex have been called Mesolithic solely on the score of typology. This designation, however, ought to be used with caution, and it would be desirable if it were restricted to objects discovered in stratigraphy or other conditions of relevant association.

In point of fact few strictly datable antiquities of Mesolithic type have been found in and around London. Nevertheless, a review of examples recovered from various deposits and an inspection of collections are informative. For, even if so many relics cannot be dated exactly, their appearance indicates that Mesolithic industrial tradition was strong in the region. Support for this is afforded by the known diffusion of artifacts in the drainage of the Thames and its tributaries. Actually the most significant remains have been found in connexion with its feeders rather than with the principal stream. This is partly because of the origin of some characteristic implements and the environment in which they evolved, spread and gained the area of this survey, namely what are now Middlesex and London.

2. THE CHARACTER OF THE MESOLITHIC INDUSTRIES IN THE NORTH-EAST AND WEST BORDERLANDS OF MIDDLESEX

Although not within the actual territory of the present review, yet close enough to it to call for mention, is the classic Mesolithic site long held to be the type-station of the Maglemosean¹ flint industry of England.² Found by the late S. Hazzledine Warren at Broxbourne, Herts.,³ four miles north of the boundary with Middlesex, the archaeological remains underlay peat determined by pollen-analysis to be of Late Boreal age. The large assemblage of artifacts, now in the British Museum, Bloomsbury, comprises plain, utilized and edge-dressed flakes and blades, scrapers, graters, residual cores and trimmings, characteristic *tranchet* axes and waste therefrom, besides a strong microlithic element. As yet unpublished, but often cited,⁴ are comparable groups discovered near Uxbridge in much the same conditions by the late F. N. Haward, and also preserved at Bloomsbury. From so near Uxbridge, in one of Boyer's old pits, west by north of the factory recently built by Sanderson Fabrics. they have erroneously been given a Middlesex provenance for they really derive from Buckinghamshire, since the finding-place lies in Denham parish.

Still another concentration, strictly matching the Broxbourne collection in forms represented, is that discovered by the author in the now vanished Sandstone gravel-workings in Iver parish.⁵ Here the great sub-station of the Central Electricity Authority now stands 200 yards from the Colne River which at Uxbridge separates Middlesex from Bucks. The compact peat overlying the gravel, upon which the flints occurred, has given pollen-counts that point to its late Boreal age, one sample according particularly well with a specimen from Broxbourne.⁶ A somewhat later dating is indicated at another spot at Sandstone which has yielded a similar industry (below, pp. 103 and 123).

Haward's site lay near, or was part of, that visited in the early years of the present century by the Geologists' Association,⁷ when many flints of exactly the same Maglemosean facies were found by the late A. S. Kennard. These first discoveries near Uxbridge seem to have been made in conditions like those observed by Mr. Haward, by the present writer on the Buckinghamshire bank and by Mr. Warren on the Lea in Hertfordshire. Because of their mode of occurrence, and in the light of

knowledge at the time, Messrs. M. A. C. Hinton and Kennard likened the artifacts to the Upper Palaeolithic Magdalenian of the caves.⁸ So far as most of the relics go, the comparison is typologically sound enough, particularly when account is taken of the parentage of the Maglemosean culture.

More recently, and until a few years before the last war, Mr. J. G. Marsden (now deceased), his sons Thomas and Mostyn, and the author recovered many artifacts, including fine microliths, by excavating at Sandstone in Iver parish. In places there were concentrations of flints upon gravel, or upon sand resting upon gravel, below shell-marl at the base of light peaty soil. This in turn lay under decayed roots and remains of heath, the whole capped with grasses and ferns. Again, compressed peat beneath an undulating land-surface locally contained flint implements with pebbles in its lower part, usually just above the water of the mere formed by the removal of immense quantities of gravel.

From five miles farther north, at West Hyde in Rickmansworth parish, Hertfordshire, also on the right bank of the Colne, the author can report some flint artifacts stained deep brown. These are identical with the ordinary output of the Mesolithic industries of Maglemosean forms found at Broxbourne on the Lea in the south-eastern corner of the same county, and in Bucks. at Sandstone, Iver, and Boyer's old pit (the so-called Uxbridge site, p.102 above) in the parish of Denham. They were taken from the pebbly lower part of peat just above water and from the heavy peaty soil removed to reach the gravel being dredged by machinery from the bottom of the old channel.

From these discoveries it has been inferred that the various clutches of stone implements are the memorials of the sojourns of small bands squatting on gravel banks and ridges beside water or on islets in lakes or streams. The character of the terrain in which such natural features occurred will become manifest in the sequel. Some of the relics of human industry found stratified, as true Mesolithic artifacts, and as the vestiges of these food collectors, beside rivers shared with other counties, must serve as standards for comparisons with the objects to be discussed from Middlesex and London.

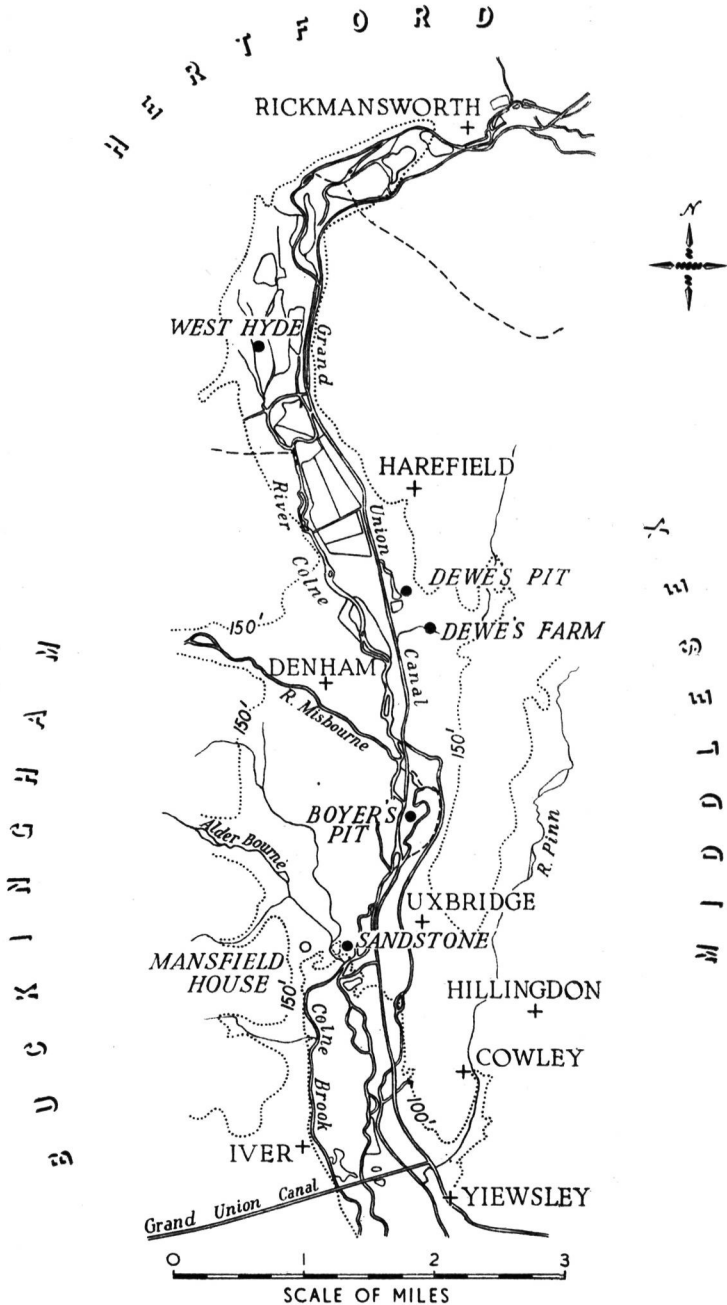


FIG. 1. Map of part of Colne Valley, with Mesolithic sites shewn by spots.

3. ORIGINS; ENVIRONMENT; DEVELOPMENT; SPREAD

The term Mesolithic applies strictly to the cultures developed in north-western Europe between 10,000 and 5,000 years ago in various climatic and environmental conditions created by the melting of the Pleistocene ice. This phenomenon marked the beginning of the Holocene or Recent epoch that carries down to the present day. It did not, however, witness any change in the economy of prehistoric man. Although the ancient fauna that had been associated with the late Upper Palaeolithic human races was replaced by the same animals as are found today, man continued in the food-collecting ways of his forerunners. To a basically late Palaeolithic equipment he added innovations devised in response to the changing conditions brought about by the waning of the ice and the attendant spread of forests, alterations in sea-level and modification of river basins. Hence the Mesolithic or Middle Stone Age was not so much a period of transition as one of survivals. The true break with the past took place therefore with the coming of the food-producing people with their new arts, so inaugurating the Neolithic or Bronze Age according to regions.

Of the Mesolithic cultures that arose on the European continent as a result of this passage from the Pleistocene epoch, the Maglemosean exerted most influence in the southern part of the North Sea drainage, in which many of its industrial traditions persisted even into the early age of metal. Deriving mainly from eastern Upper Palaeolithic strains, it was cradled in the Baltic area. From encamping in boggy places on the banks of rivers and lakes, its exponents came to settle on moors and islets while the Baltic trough was occupied by the fresh-water Ancylus Lake. As sea-level outside was also lowered the Dogger Bank became an island, and land-connexions were brought into being between the Continent and Britain.

Analysis of the pollen sealed in the peat that encloses the material evidence of Maglemosean activities shews that birch and pine then predominated among trees. On the strength of this and other means of dating, the remains are assignable partly to the late Pre-Boreal, but mainly to the Boreal climatic phase, from after 8000 to about 5000 B.C. Dry continental conditions obtained during this spell of mildening climate, increasing warmth and developing woodlands. Relating the three main groups of Mesolithic cultures that arose in the Baltic region

to the post-glacial molluscan evidence, and particularly to the spread of forest trees under the improving conditions, Professor J. G. D. Clark has sub-divided them in terms of the natural chronology.⁹ Thus, the Maglemosean industries in the area of their development may be said to belong to Forest Culture Period II.

That the Maglemoseans were more versatile craftsmen than their Palaeolithic and early Mesolithic (Period I) ancestors appears from an assorted industrial output. Besides such ordinary artifacts as flakes and blades and their derivatives, typical axes and adzes known as *tranchets* call for particular mention. First occurring in Maglemosean industry, they were among the longest-lasting of prehistoric tool-forms. A characteristic transverse scar distinguishes their cutting-edge, from the production of which by a specialized method a typical waste- or trimming-flake resulted. Among the great variety of stone tools there have been found ground and smoothed specimens with edges bevelled to a cutting-edge and others planed by pecking. Hammers and mace-heads prepared in pebbles and partially or completely perforated for holding or hafting are also recorded.

With this kit the Maglemoseans worked bone, elk and red deer antler as well as wood, making parts of hunting- and fishing-gear and holders for stone and bone tools. They were skilled in fashioning bone and antler into plain, notched and barbed points, fish-gorges and hooks, axe- and adze-like mattocks, mostly perforated for hafting and very probably used for dealing with the blubber and fat on carcasses. In addition they manufactured microliths to mount in bony and wooden heads of weapons and domestic implements. Fibre and bast they employed too. By drilling and engraving they ornamented small objects and pieces of bone and antler with conventionalized patterns and representations of animals and human beings. Where they stayed to hunt, fowl and fish they set up tents, shelters and wind-breaks of branches.

Using boats, constructed more probably of birch-bark than hollowed out of logs (for the making of which they were not adequately equipped), the Maglemosean folk spread far across the extended European plain in a familiar and uniform environment. Over the generations bands of them eventually reached the coastal grounds north of the Humber, and of the migrants who also alighted on the east and south-east some pushed up the valleys of the Thames and tributaries, among these the Medway, Darent, Lea, Colne and Kennet. In the undrained lower reaches of fens and swamps with ridges and islands of gravel they found all the game, birds and fishes they could chase, snare, trap, lure and spear.

In our area the Thames then coursed between unconfined banks, very different from the protective works engineered in modern times to restrict it. Many streams joined the main river, the northward-flowing being fewer perhaps but generally longer than those running south from the range of heights that today include Dollis Hill, Hendon, Hampstead, Highgate and Muswell Hill. Doubtless such tributaries were more numerous during the Early Post-Glacial period than are comprised in the lists drawn up by historians. Nevertheless several streams traverse that part of the Thames basin which embraces Middlesex and London of the present day*. Of those that persist, few are actually visible within the immense built-up areas. For since Roman times they have gradually been arched over and incorporated in the system of sewers. As such they are to be counted among the "buried" streams of London.¹⁰

* See sketch-map, fig. 9, relating to no. 10 of the conclusions, p.145.

II. HOLOCENE DEPOSITS IN MIDDLESEX AND LONDON

1. CHANGING RELATIONS OF LAND AND SEA

About eight thousand years ago the dry continental Boreal conditions passed into the moist, warm and insular climate of the phase named Atlantic. Induced by a general sinking of the land whereby the sea regained its mastery, these conditions witnessed the development of the Mixed-Oak-Forest. Concomitantly with the submerging of the territory reclaimed earlier from the sea the land-bridges were severed and Britain became detached from the Continent. With this our modern island history began. The effect upon the main rivers in south-eastern England was to shorten and widen their estuaries, causing the tides to flow farther inland. Below London the marshes along the Thames became saline,¹¹ and in our region the tides reached farther upstream. While the raising of sea-level was responsible for reducing the length of the smaller tributaries and the lower reaches of the larger, it would cause such streams as the Roding, Lea, Brent and Colne to flow more slowly. In so doing they would tend to redevelop old distributary channels, a process that long continued under natural conditions.

The submergence initiated rather late during the Boreal climatic phase, and marking in its waxing the transition of this phase to the Atlantic, profoundly affected south-eastern England thereafter. It comprised the Flandrian transgression that created the English Channel, and had its counterpart in the high-level Tapes Sea around the south-western part of Scandinavia and northern Denmark. Here the marine invasion broke down the sill enclosing the Ancylus Lake on the west and rapidly overran the banks of that great fresh-water body. Thus the Litorina Sea of increasing salinity came into being and occupied the Baltic depression. To the changed environment the food-collectors adapted themselves. Settling along the shores of this new and almost entirely enclosed sea, they developed the kitchen-midden culture known as the Ertebølle (Forest Culture Period III).¹² Basically their equipment was a modified form of Maglemosean to which pottery was eventually added, owing probably to contacts with early Neolithic people. The Ertebølle expression of Mesolithic culture had contemporary equivalents along many parts of the coasts as well as inland in north-western

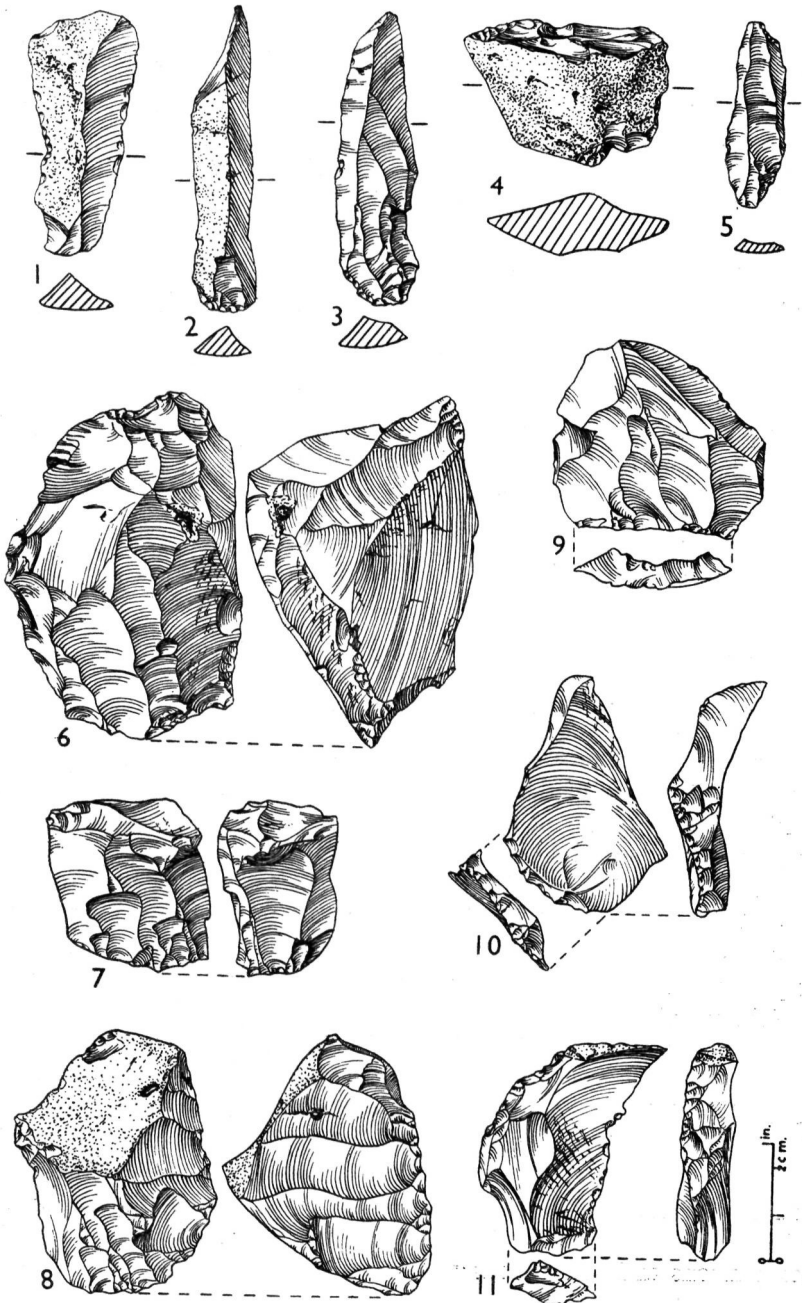


FIG. 2. Flint industry from Dewe's pit, South Harefield.

Europe. In England the industry of Late Atlantic age found under peat and marsh deposits by Mr. J. P. T. Burchell, F.S.A., at Lower Halstow, Kent,¹³ is the best known, for its output very closely resembles the products of the ancestral Maglemosean.

Since those events of Atlantic times there have been intermittent uplifts and sinkings of the land in north-western Europe. The present outlines of the Baltic Sea and of our coasts are due to the emergence that began to operate during the first half of the Atlantic climatic phase, soon after the Litorina Sea and its counterparts attained their maximum and the post-glacial climate its optimum. The climatic and vegetational response to the recovery of the land was a modified return of continental conditions and conformable forest trees in the Sub-Boreal between *ca.* 2500 and 850 B.C. About this time the renewed and slightly rising sea-level induced somewhat damp and cooler conditions of the Sub-Atlantic phase that carries the history of our climate down to the present.

2. VALLEYS OF THE LEA, COLNE AND THAMES

No great distance separates south-eastern England from the chief continental theatre of the phenomena described above, so it is not surprising that the reality of the physical changes is shewn in this region by sediments that range from Late-Glacial to historic times. No complete series of beds, however, is known to the writer as having been found at any site in our area, but the absence or presence of one or other deposit is of local significance only. It may therefore be supposed that the sequence can be ideally drawn up by linking the principal strata observed at different places.

The lower reaches of the Lea and Colne, which are so important to this study, have been recognized as comprising layers that prove informative of the order and nature of deposition since the melting of the Pleistocene ice. Of course the ample records of later arctic and post-glacial episodes made by able workers in the valleys of these two rivers can be tied to the Pleistocene succession registered by the gravels and other beds in the Thames basin, which provide so many standards for comparisons and correlations.¹⁴

Owing to the coadjutant deductions of geologists, botanists and zoologists the character of several crucial deposits associated with these tributaries is well known. Especially is this true of the Lea valley, though some results have been obtained for the Colne that offer more than visible traits of identity. As far back as 1922 the revisers of the regional geological memoir lamented that the archaeologist had little to give the stratigrapher who most needed assistance in connexion with deposits subsequent to the so-called Middle Terrace.¹⁵ Now, this was written many years after some prehistoric flint artifacts had been recovered from just such deposits in the low grounds through which flow these two rivers and other feeders of the Thames. While the age of these relics of human industry was then only surmised,¹⁶ a more accurate estimate can be advanced today in respect of some of the past discoveries. This has been made possible by the assessing of later finds, very largely by the application of the pollen-analysis of peats. One wishes therefore that researches were continued in the basins of these rivers that appear to hold considerable promise for the palaeobotanists.

The particularly important deposits in the lower courses of the Lea and Colne have been revealed in cuts and bores, and especially in great excavations for the winning of the flood-plain gravel. Extraction is normally effected by huge dredging-grabs, the preparations for which broach overlying alternations of silt and mud, clay, shell-marl and peat. Of the series of deposits represented in the two valleys, those in the Lea are the better known.¹⁷ Over far greater expanses complications have been observed along the main, large and minor tributary valleys, in the open as well as in the reclaimed and overbuilt marshes within Middlesex and London, to east and west, also on the south or right bank of the Thames. These irregularities do not confuse the general sequence.

Although the valleys of the Thames and its tributaries have not sensibly altered since the close of the Pleistocene epoch, there have yet been minor changes. Such are the forming and filling of various subsidiary channels. Considerable interest attaches therefore to the deposits associated with several of these, particularly in the lower reaches of the River Lea, for the geological, floral and faunistic evidences they have provided. From some there have also been retrieved objects of much archaeological importance. To the physical causes that have produced many of these late streams, beavers may have contributed. On the borders of Middlesex and Essex, around Walthamstow,¹⁸ the abundant bones of these tireless dam-builders suggest that their colonies were numerous and long-lasting

enough to cause widespread flooding. This appears to be registered permanently by the swamp peat that entombs the remains of an inundated forest.

Man, too, has been a powerful geological agent. At different times he has been responsible for diverting, cutting, widening and deepening waterways. During the nineteenth and present centuries the construction of great reservoirs, especially in north-eastern London boroughs, profoundly affected the valley of the Lea. Again, to the ever-increasing commercial extraction of gravel by highly developed dredging machinery is due the carving out of fresh branches of main streams and the creation of considerable lakes. In many places in south-west Middlesex such openings are conspicuous features in the flood-plain of the Thames, and they are common in the territory drained by the Lea. However, the most spectacular are in the valley of the Colne between the confluence with the main river at Staines and Rickmansworth close to the borders of Middlesex, Buckinghamshire and Hertfordshire. For the latest inch-to-the-mile O.S. map¹⁹ shews the Colne widened and linked with subsidiary courses, joined in many of its meanders by channels to the Grand Union Canal, and expanding into meres and ponds with a network of connecting leets and ditches. This bewilderingly complicated hydrographic system over a stretch of twenty miles, particularly in the tracts of most import to this paper, namely between the neighbourhood of Harefield and Yiewsley-West Drayton in Middlesex, is attributable to the very active operations for winning the flood-plain gravel which have been carried on with growing intensity. How extensive this work, and how rapid the expansion of the waters, will be realized when the contemporary sheet of the same scale is compared with that²⁰ shewing the area thirty years ago. The distribution map of sites in the region gives an idea of this (fig. 1).

The gravel dug for at low elevations in the wet pits in our district is the infilling of the buried channel that, extending from west Middlesex eastward far below sea-level, was apparently carved out during the fourth glaciation. Locally the gravel is banked against deposits resting upon the Taplow Terrace. It comprises sands, loams and peat, much of the last being drawn from great depths in the course of commercial operations. The plants and animal remains recovered from all this basal material shew that by the time the channel was filled conditions cooler than the present obtained.²¹ With the subsequent mildening of the climate the Pleistocene epoch or Ice Age gave place to the Holocene or Recent age of the geologist. In terms of archaeological chronology, therefore, the low

flood-plain gravel and its floral and faunal ingredients are referable to the Upper Palaeolithic Age.²²

From the foregoing it is manifest that the beds resting between the low-lying gravel of Upper Palaeolithic age and the topsoil belong to post-glacial times. These deposits constitute the Holocene alluvium in the lower Thames valley downstream from London. They also fill a subsidiary course that was eroded out of the lower flood-plain gravel occupying the main buried channel. At places in the Thames estuary, notably dock-excavations in the neighbourhood of Tilbury and Gravesend, the alluvium has been proved to a depth of 60 ft. below O.D.,²³ and near Charing Cross to a thickness of 15 ft.²⁴ Peat, its deepest-lying constituent, is separated from the basal chalk by sand and gravel, together 10 to 20 ft. thick. This suggests an elevation of the land of about 80 ft. above the present level, and it gives an idea of the amount of subsequent uplift because the river had again to cut down to a great depth to reach base-level. This process of renewed down-cutting or erosion may confidently be referred to the Pre-Boreal climatic phase onward until the emergence attained its peak early during the succeeding Boreal. As already stated (pp. 105-6), it was then that Britain and the European continent were connected by the land-bridges that enabled Mesolithic migrants to enter our region.

The subsequent land-sinking and marine expansion marking the transition from the Boreal climatic phase to the Atlantic, and equated above with the development of the Litorina Sea in the Baltic basin (pp. 108 and 110), witnessed the filling of the inner burial channels with the alluvial beds that have been noted in the lower Thames and in the valleys of the Lea and Colne. The various layers of peat of different ages, already glimpsed (pp. 102-3) and to be mentioned farther on (pp. 115-24 *passim*), are held to register pauses in the drowning of the lower reaches of these valleys,²⁵ a process involving movements that have corresponded with oscillations round the coasts.

In the lowest reaches of the larger tributaries joining the Thames between, say, Brentford and the sea, the same order of Holocene deposits broadly holds as in the estuary of the main river, allowance being made for the decrease in effect upstream of changes in base-level. Going upstream from the estuary or confluences, however, one may notice that the Holocene deposits gradually rise in elevation. So effective is the incline in the Lea valley northerly towards Hertfordshire from the Hackney Marshes and Walthamstow, where the buried channel has been

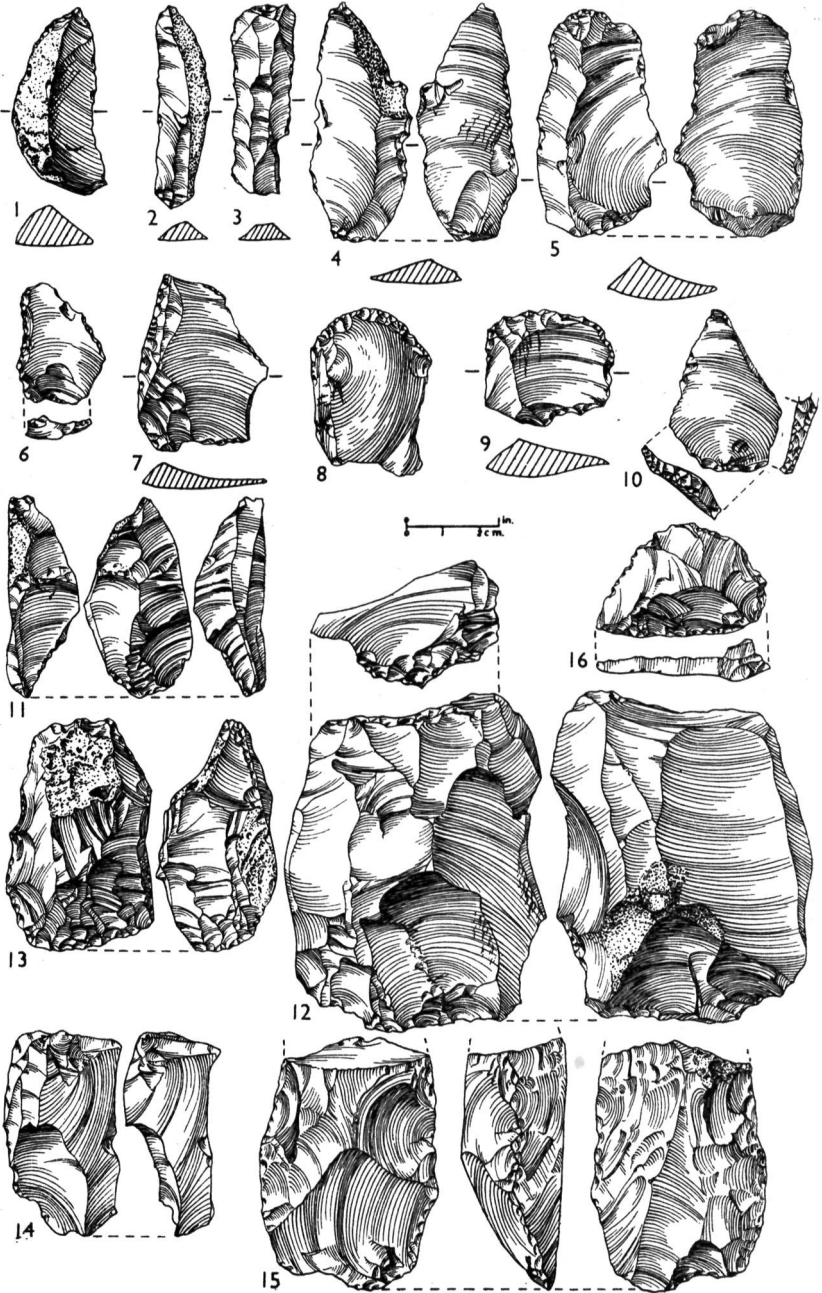


FIG. 3. Flint industry from Dewe's Farm, South Harefield.

proved to nearly 60 ft. down,²⁶ and from Staines to south of St. Albans in the Colne valley, that in places the gravel stands above water and the topmost deposit supports vegetation.

Locally the gravel forms ridges or small islands under the alluvium. The Anglo-Saxon suffix in place-names testifies to the existence of such patches, whether unseen today or still visible, as aits and eyots; as Battersea and Thorney, etc.; and also Frog Island.

Actually there is a fall in the valleys, but it is not uniform. Thus, for seven miles from Staines in the main one the amount is 3 ft. per mile; in the Colne Valley from 130 ft. near Harefield to 50 ft. at Staines; and over the same distance in the Lea and Roding valleys 3 and 7 ft. per mile respectively.

Besides the conspicuous tracts of alluvium that from Watford, Herts., and Harefield, Middlesex, to Staines, distinguish the Colne valley, and from Enfield to Hackney and Blackwall lend character to the Lea valley, only a few alluvial belts are mapped prominently along the left bank of the main river. These occur at Pimlico, Westminster, Charing Cross, Wapping, the Isle of Dogs and generally in the dock area. Among the lesser streams bordered by alluvium is the Brent, to which can be added the buried Ty Bourne (Tyburn), Fleet and Walbrook. On the south or right bank, along the main and tributary streams alluvial flats are on the whole more numerous and larger than on the north side.

Varying in thickness and irregular, the Holocene beds in the lower reaches of the principal rivers in our region nevertheless comprise certain well-defined layers, but owing to local erosion and deposition they may be of very different ages though similar in appearance. This is shewn only by the molluscs in the shell-marl often found upon the sand that quite commonly overlies the flood-plain gravel.²⁷ Inconsistency also appears from the cover of clayey peat forming a compact, heavy black mass locally charged in its lower part with small pebbles. Frequently encountered on top of the flood-plain gravel in and close to the commercial workings in water, this dark deposit dries hard like stone. Peat of much lighter body and peaty soil also occur in places, one or both overlying, with or without any intervening layer, the dense black material. Remains of forest trees and other vestiges of plants are common in the peaty beds. Where these have not been disturbed in dry areas they support shrubs, heath or grass, and in marshland aquatic plants. Over the centuries in several localities these upper beds have been cultivated. Spoil from excavations and the tipping of refuse near built-up areas have also contributed to the altering or supplementing of the natural layers.

Only the deposits bearing directly on the author's theme need be considered at any length here. Regarding their chronological span it is enough to say that under or in them there have been found relics of industry ranging from true Mesolithic to Roman. From their contained archaeological remains Warren assigned some alluvial deposits in the Lea valley to the historic period and even to our own day,²⁸ which means a stretch of several thousands of years. The beds are in the main connected with just such land-movements as have taken place since Holocene (post-Pleistocene) conditions obtained. This is the present author's experience in the Colne valley on the borders of Buckinghamshire and Middlesex near Uxbridge. Varied in age therefore as are the sediments, an approximation of their place in the post-Pleistocene sequence will appear when the older antiquities are examined.

III. ARCHAEOLOGY

1. HAREFIELD MOOR, WEST MIDDLESEX

The writer has sought to continue the late J. G. Marsden's scrutiny of the alluvial deposits three miles north of Uxbridge. Having surveyed the area as opportunity offered during the past twelve years, he can now comment further on local conditions and add something to the archaeological finds that keen-eyed observer assembled from the Middlesex parish of Harefield, not far removed, of course, from the sites at West Hyde, Herts., already mentioned (p.103).

The principal area of discovery, Harefield Moor, forms an irregular quadrilateral one mile south-west of Harefield village and $\frac{3}{4}$ mile west of St. Mary's parish church. With its long axis disposed approximately north-west—south-east, the moor is about two miles in length and one in width. On the north it is bounded by meanders of the River Colne separating Middlesex from Hertfordshire and Rickmansworth parish. The river also limits the moor on the west and divides Middlesex from Buckinghamshire and Denham parish. Practically the embankment of the Wycombe line of the British Railways (Western Region) may be regarded as the bounds of the moor on the south, a furlong beyond a small stream flowing westerly past Dewe's Farm. East of this steading, northward up the valley, the moor is flanked by fields that rise to the Uxbridge-Harefield road. This ascends from 127 ft. near the farm to 164 ft. opposite the church, and thence to 292 ft. in the village.

With its surface-level uniformly at 120 ft. above O.D., Harefield Moor is essentially such an expanse of peaty fens supporting heath, scrub, coarse grasses, aquatic plants and some small coverts, as are those other alluvial tracts in the tributary valleys of the Thames described in earlier sections of this paper. As remembered before so many houses and works were built upon Harefield Moor, one had no difficulty in visualizing the locality as food-collectors would see it in the Early Post-Glacial period. The sojourns of such folk is attested by the flint artifacts that the moor has yielded.

Sporadic finds have been made, but two sites south of Moorhall Road and east of the Grand Union Canal proved fairly prolific. All the scattered objects were recovered from hard, compressed black peat exposed in the walls of cuts. Some of the flints occurred with, or just under a sprinkling of small pebbles and sand upon gravel emerging

above, or immediately on water-level. Elsewhere great heaped masses of this peat, that had been dug up by the grabs from the surface of the moor down to the gravel, gave a few more easily seen specimens.

(A) SOUTH HAREFIELD (DEWE'S PIT)

A third of a mile south of the ruined thirteenth century Moor Hall chapel, the flood-plain gravel was dredged in a working known as Dewe's pit by *much simpler machinery than is used over a far greater area* by the present operators, Messrs. John Hawtrey and Co., Ltd. Where this firm's plant and local offices stand (1 in. Sh. 160, TQ 054884) the same conditions obtained as indicated by the odd flints, but the artifacts were so much more numerous and concentrated that a good representative series can be illustrated. *Although the peat under which the artifacts lay, or from which they were extracted, varies much in thickness, it generally forms a heavier overburden on Harefield Moor than at Sandstone in Iver parish down the valley (above, pp. 102-3). Similarities are strengthened by the circumstance that at the site on Harefield Moor spreads were revealed where, instead of black compact peat, crumbling peaty soil occurred under the moorland vegetation. Implements taken from it, like other finds from the Holocene beds in the locality, are made mostly of fine dark flint from the Chalk, although some are lighter in hue and mottled green. Another feature of resemblance is that, as elsewhere on this moor in western Middlesex, and whatever the containing alluvial deposit, the relics therefrom are in the same state of pristine sharpness and pleasing brown and dull staining as is so characteristic of Mesolithic artifacts from the alluvium of the Colne and Lea valleys.*

A survival of Upper Palaeolithic tradition that manifests itself in Mesolithic stone implements of the Maglemosean industrial fashion appears here particularly in the fine parallel-sided blades collected. Of these, fig. 2, nos. 1-3 and 5 are good examples. The first two retain some of the original crust of the parent nodule, and their edges exhibit signs of wear as knives or saws. Nos. 3 and 5 derive from material on which flaking off was carried farther. Both, besides being slightly worn of edge, bear some marginal retouch. In no. 5 this is in microlithic style, which is interesting since no true microliths have so far been found on Harefield Moor, and this despite the evidence that the cores afford of the production of small, delicate blades.

A plain, corticated, short and wide flake provided material for the scraper (no. 4), bearing minimal trimming near diagonally opposed corners. Such implements, however, were not commonly made here, but, if the site has yielded retouched pieces and no finished microliths, the abundant cores shew it to have been an active knapping-floor. Testifying by their scars to the diversity of blades that were struck from them, examples nos. 6, 7 and 8 could well in their final products have been the foundation of a microlithic element. For the region no. 8 is interesting as a steep scraper simply achieved by the application of retouch along the edge of a well-flaked core. Trimming-flakes detached from cores are so many more indications of the existence of a working-floor. Deriving from different parts of cores, some specimens are thin, as no. 9; others are thick, as nos. 10 and 11. These no doubt appeared attractive to the ancient artisan who transformed them into efficient tools, an end-scraper and a convex side-scraper respectively.

(B) DEWE'S FARM

South of Messrs. Hawtrey's workings, for over $\frac{1}{4}$ mile towards Dewe's Farm, an intensively cultivated strip lies between the lake artificially re-formed or enlarged in the moor and the low escarpment bordering the rising ground on the east. Evidently this bluff had fringed a formerly wider lake, along the gravel and sandy banks of which squatters encamped, as is demonstrated by the number of flint implements found here. These flints owe their exposure to the removal of the capping of low plants at some time long past and to the regular deep ploughing and treatment of the underlying peaty material. Soundings and inspection shew that in this tract the overburden broached by the agricultural operations varied much in thickness. Indeed, in places the top of the flood-plain gravel is no less than 6 ft. from grass-level, in others its surface outcrops flush with that of the surrounding arable soil. Here and there bones and teeth of large wild animals have also been turned up, besides fragments of trees, pine, birch and hazel being well represented.

Brown-stained and green-mottled, the artifacts brought to light in the circumstances described are identical in facies and treatment with those from the peat and heavy peaty soil at the other finding-places on Harefield Moor. In common with these industrial relics, they differ from the patinated and grey flint implements picked up from the surface of the adjacent rising ground and fields in the neighbourhood.

The forms selected for illustration, as fig. 3, from the low-lying terrain are the impressive complement of the representative group (fig. 2) associated with the heavy peat. Looked at together, all the specimens from Harefield Moor and figured here might have come from the hands of the same craftsman.

Among the flakes and blades, which constitute the majority of the discoveries, a high proportion shew wear along their edges, as nos. 1-5. Dressing, as differing from injury, appears from the drawings of nos. 1 and 4, the second also bearing the signs of inverse edge-retouch. Similar treatment was given to no. 5, which is actually trimmed near its tip on the edge of the upper surface.

Better defined than these last tools are the scrapers nos. 6-10. The pair nos. 6 and 7, side-scrapers on thin flakes, are blunted steeply along their greater edges, slightly concave in the first and straight in the second. Much interest attaches to their companions. Technically no. 8 should be a side- rather than an end-scrapers, since its admirably dressed working-edge lies across the main axis of the flakes as indicated by the bulb of percussion and concentric ripples. Although so short, no. 9 on a complete piece answers to the standards of end-scrapers. Glaze on its surface may be due to the action of sand and water. On no. 10 the retouch has been applied along the edge of the striking-platform, thus transforming the curious flake into a butt-end scraper. Fine additional working appears on its right edge at the lower end.

Usually one connects gravers, like the typical example no. 11, with the working of bone and wooden gear, such as was produced in Upper *Palaeolithic and descendant Mesolithic industries*, particularly those like the Maglemosean that was associated with just such an environment as the Harefield fen (above, pp. 105-6).

Cores, though numerous, are not really so varied, squat, straight-sided examples being the rule, and two- or multi-platform specimens common. Core no. 12 is typical of the place. Pyramidal shapes are rare, but this is not surprising since so few small flakes and blades have been found. No. 13 has been adapted by delicate secondary dressing and edge-trimming to form a stout, steep scraper. It is perfectly in keeping with the Mesolithic character of the assemblages of artifacts found stratified in these tributary valleys of the Thames. A core-trimming, no. 14, is also represented to shew material detached from one of the few cores found to have given small blades.

No. 15 alone, as the lower part of a typical *tranchet*, is decisive, for it proclaims the Baltic origins of these industries from the peaty beds on Harefield Moor. Although this tool is unfortunately incomplete, the essential feature of its characteristically scarred cutting-end causes the implement to rank with others of its kind found under Late Boreal peat at Sandstone, Iver, in the Colne valley, at Thatcham in the Kennet valley, Berkshire,²⁹ and at the type-station of the English Maglemosean flint industry near Broxbourne, Herts., in the valley of the Lea.³⁰ To this can be added specimens equally expressive of the penetration of the Baltic Mesolithic method, e.g., no. 16, a waste slice resulting from the blow dealt transversely at the end of a *tranchet* or pick to sharpen it in the manner described by Clark.³¹

The implementiferous peaty soil near Dewe's Farm is to all appearances the same as that which has yielded comparable strictly similar artifacts considerably above the water at Sandstone, Iver. Samples of this soil were examined by Mrs. Elizabeth Knox, Edinburgh, to whom the author is indebted for counting the contained pollen grains. Her readings,³² despite the disappointing infrequency of pollen in the samples, indicate the presence of some hazel, birch, willow, a little alder, much fern, and a fair quantity of pine. Poor as is this assemblage, it yet suggests to the writer that the actual transition from the Boreal to the Atlantic climatic phase was under way. This, it is thought, would not be discordant with the estimated Late Boreal dating for the lower compact peat on water at Sandstone (above, p. 103), which like that on Harefield Moor contains or overlies a comparable industry. In this regard it is possible that the closely set flake-scars on the *tranchet*, fig. 3, no. 15, point to manufacture somewhat later than that of the more boldly faceted specimens found under Late Boreal peat at Broxbourne and Sandstone. Of course this suggestion may be supported or negated by an awaited report on the pollen-content of the samples of the soil. If it be validated, then an early Atlantic dating for the artifacts from the deeply ploughed area between Dewe's Farm and Hawtrey's plant is quite compatible with the age to which other discoveries are referred. In this respect one thinks particularly of those from the Mesolithic site so carefully studied by Mr. J. P. T. Burchell, at Lower Halstow in the estuary of the Medway, Kent.³³ Including tool-forms of the kinds described above, the producing industry is remembered as having been assigned to the Atlantic climatic phase. It has also been regarded as the natively developed equivalent of an industry of the Ertebølle kitchen-midden

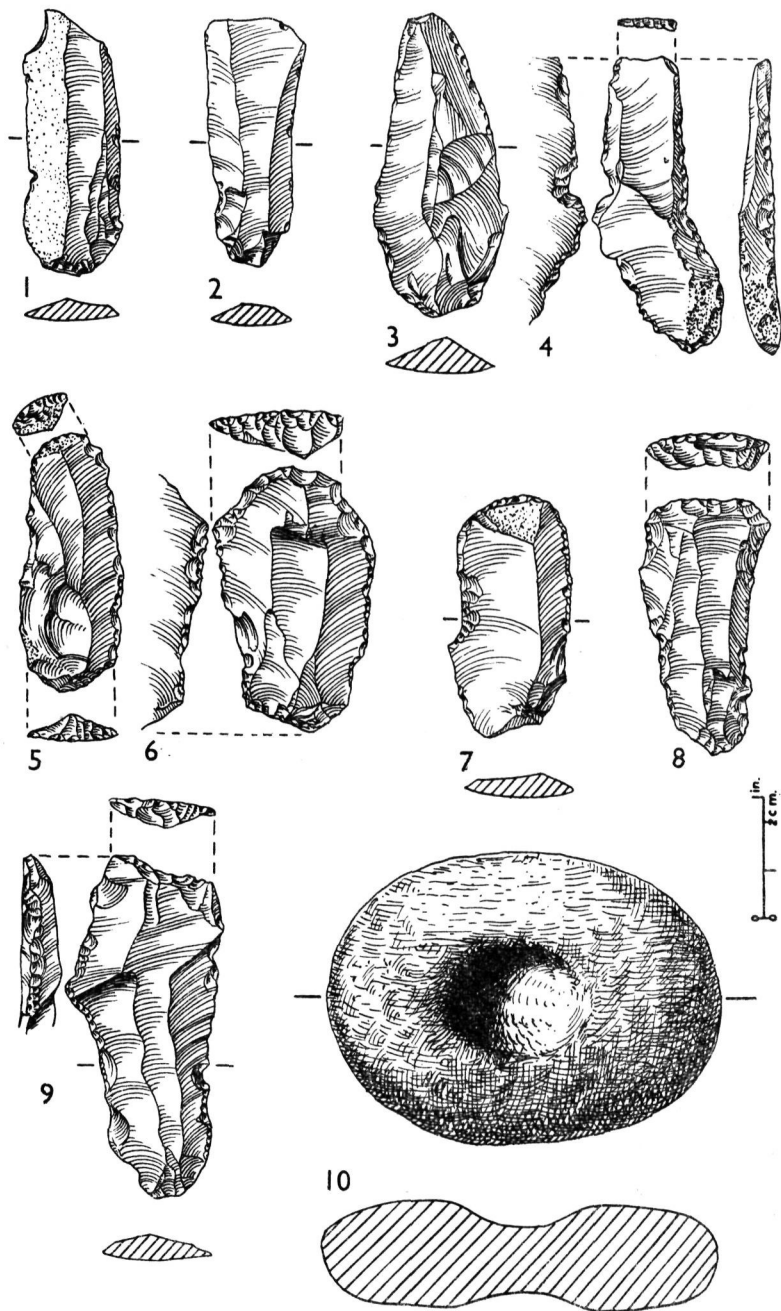


FIG. 4. Artifacts of flint and other stone from Hackney Brook.

culture that grew along the shores of the Litorina Sea in the Baltic region from Maglemosean strains of the preceding Boreal period.³⁴

2. LINKS WITH FORMER STRATIFIED FINDS

The foregoing review of Holocene deposits and their archaeological contents in west Middlesex helps today in our assessment of some past discoveries in various places within the geographic scope of this Society. These discoveries consists of objects of stone and bone found stratified or in other conditions indicative mainly of the riparian habitat of Early Post-Glacial colonists. Most of these peoples' relics to be discussed in the sequel were amassed during the last quarter of the nineteenth century, a period marked by a great zeal for prehistoric antiquities on the part of collectors, many of whom were endowed with considerable discernment. Imperfect, however, as their records were, they can be understood better today because supplemented and made clearer by inferences drawn from recent work. Hence many of the antiquities concerned seem now to fall into their proper place in the human history of the region. Having all these, one can afford to exclude from present consideration sundry flint artifacts picked from the surface or turned up in the breaking of shallow ground. For, attractive though some of those examined in course of recent inquiries undoubtedly are, none is really in itself distinctive enough to warrant a place in this paper.

3. HACKNEY, EAST LONDON

Regrettably the work of the late J. Exhall Greenhill, Principal of Vermont College, Clapton, seems to have been forgotten. Yet, about eighty years ago his investigations helped to throw considerable light on the prehistory of east and north-east London.³⁵ Some of the results

he obtained, mainly following the extensive operations of the East London Waterworks Company (above, p.112), can reasonably be linked with discoveries fundamental to this contribution to the Society's *Transactions*.

In addition to the Palaeolithic artifacts Greenhill recovered from Pleistocene deposits, there are several relics of a blade industry which are preserved in the Central Library, Hackney, such as his finds near the Hackney Brook, a demonstrably late stream.³⁶ Here he had noted that exposures normally revealed, in downward order, ordinary soil or peaty earth to a depth of 3 ft. overlying about 9 ft. of gravel, ochreous in its upper part and clayey in the lower, with a local occurrence underneath of unusually large pebbles in sandy shell débris.³⁷ After searching through the collections arranged in the library by the late Mrs. A. R. Hatley,³⁸ the writer made up a series of artifacts for drawing from among those found by Mr. Greenhill under peat and over gravel at his site. Simply called Neolithic, they were evidently considered at the time of discovery to be of less account than a greenstone axe-head recovered with a bone tool from the surface soil. As the illustrations shew, the components of the group, fig. 4, found so much deeper down are of a much earlier facies than Neolithic, and this justifies their being ranked meantime with the Mesolithic series figured in the preceding pages.

Most of the relics from the Hackney Brook site are of the same grey and greenish banded flint as many of the implements from Broxbourne and the Colne Valley. Several indeed exhibit the same staining as the artifacts from and under peat in our western and north-eastern borderlands.

The Hackney assemblage appears to be of choice objects rather than a full clutch. Still, it is comprehensive enough to shew its pre-Neolithic character. Moreover, its constituents were discovered in much the same conditions as were the comparable relics held to be Mesolithic from Broxbourne farther up the *Lea drainage*, from around Harefield to Uxbridge, as well as from the Admiralty site described below (pp. 126-7).

All the specimens are in good condition and unpatinated. Though many consist of trimmed, defined tool-forms, the basic material on which they are fashioned shews that blades were the mainstay of the manufacturers. Parallel-sided, as nos. 1 and 2, and leaf-shaped, as no. 3, are about equally represented. Of the first, nos. 1 and 2 are worn from use, as is no. 3 of the second sort.

In contradistinction, their companions are deliberately dressed along the edges. No. 4 is laterally notched opposite steep working, and terminates in a fine top with a steep edge. A long, narrow downward facet and a short one on opposite sides impart so distinctive an aspect as to suggest a double angle-graver. Both ends of the rather thick implement no. 5 are retouched, and thus permit of our calling this a double end-scrapers. Simpler, however, is the ordinary end-scrapers no. 6 with steep trimming carried round the top. On the nether or separation surface there are signs of retouch along one side, and some delicate nibbling occurs on the face along much of the right-hand margin. Similar fine trimming so distinguishes the scraper no. 7 as to rank it with microliths for workmanship. Its unusual square end warrants the inclusion of scraper no. 8, and especially recalls Upper Palaeolithic forms of thick-ended flakes and blades. Normally the type is not a product of industries weak in the older traditions. On typology alone such a piece (no. 8) would therefore uphold at least a Mesolithic ascription of the series that already in several of its components proclaims the craft of food-collectors. That in this part of the Lea basin these people were in many ways equipped like their Palaeolithic forerunners appears also in the multi-purpose implement no. 9. Primarily a knife, it bears some marginal retouch besides many signs of wear, and at its wide end it is shaped to a faintly concave scraper-edge. As the drawing indicates, the top left corner bears a narrow facet backed against another practised down the side, thus forming the working-edge of an angle-graver.

Matching Maglemosean examples from south Sweden,³⁹ a quartzite pebble with countersunk hollows, no. 10, enhances the Mesolithic aspect of the group and points to mainly Baltic affinities. Apparently unrecognized until now, it is another interesting typological addition to the list of prehistoric stone implements in our particular area of research. As such it compensates a little for a lack of more precise details on Greenhill's site.

4. ADMIRALTY, WESTMINSTER

Recognition of the variability of the alluvial deposits overlying the flood-plain gravel permits of our rating as Mesolithic at least some of the flint artifacts found in 1890 by Mr. W. J. Lewis Abbott

in sections about 100 yards long and 40 ft. deep revealed by excavations for the foundations of new Admiralty offices in Spring Gardens, St. James's Park,⁴⁰ the surface standing at 20 ft. O.D. Here the flood-plain gravel constituting the lower layers contained an arctic bed akin to that discovered many years later by S. Hazzledine Warren in the valley of the Lea. Besides evidently derived remains of Pleistocene mammals, it yielded flakes which Abbott assigned to Mousterian and even earlier cultures.

The Admiralty site may be regarded quite properly as being associated with a tributary rather than the main river. It lies just above the north-east corner of low ground that was formerly a marsh or fen bordering the ancient Thorney island (above, p.115) on the north, and crossed by one of the larger channels of the divided Ty Bourne (Tyburn). Reclaimed in the course of time, this area has become St. James's Park, the stream going to form the ornamental lake therein.⁴³

Only three specimens from the Admiralty have been traced among the assemblage of prehistoric antiquities acquired from Mr. Abbott in 1929 by the Wellcome Historical Medical Museum, fig. 5, nos. 1-3. Of these, one, no. 1,⁴³ is labelled as coming from the lower sediments. Though far from being typical of any specific culture, in its fresh condition and perfectly preserved, fine edge-dressing, this implement matches its two companions, the finely made scrapers nos. 2⁴⁴ and 3⁴⁵ from the upper beds. The material in which they are worked is a greenish-grey mottled flint closely resembling some used in the industries of Hackney Brook, Broxbourne and the Colne Valley.

It is clear from a later review of his discoveries in the Admiralty section that Mr. Abbott,⁴⁶ in common with Messrs. Hinton and Kennard⁴⁷ and other searchers in Holocene deposits, realized that the artifacts from the alluvial beds topping the flood-plain gravel were not as late as Neolithic. Considering therefore their mode of occurrence on an old land-surface with microliths and other artifacts, peat and quantities of floral vestiges, shells of snails, and bones of animals, these two well-made scrapers record an association that links these tools with the groups of Mesolithic forms described above from the valleys of the Colne and Lea and with others to be noticed.

Means of checking Abbott's section are, of course, not available. However, he made an important find in the fragment of the carapace of a large fresh-water tortoise (*Emys*) in the marl and chara bed overlying the upper deposit from which he extracted the flint tools

nos. 2 and 3. Curiously enough, the notice on this fossil appears not to have attracted attention, although in the absence of other indications it is strongly suggestive and helpful.

Beyond the fact that the Pleistocene fauna represented in the gravel has little in common with that in the upper beds which overlie the gravel, the animal remains at the Admiralty have really nothing out of the normal to teach us. It is otherwise with the chelonian plate from the layer immediately above that containing the assemblage of flint artifacts whereof nos. 2 and 3 are the remnants. For this bone of a tortoise is evidence of the post-Pleistocene migration of a southern form that could only have reached the latitude of London when the climate was much warmer than now, maximum being attained during the first half of the Atlantic period (see above, pp. 108 and 110). Support for assuming an Atlantic dating for the bed yielding *Emys* is afforded by Abbott's reference to the large size of the shells of at least one of the fresh-water molluscs identified.⁴⁸

From all this it is apparent that Abbott's upper implementiferous bed was laid down at the latest during the Atlantic climatic phase, and, of course, before the overlying tortoise-shell-bearing bed. It is even

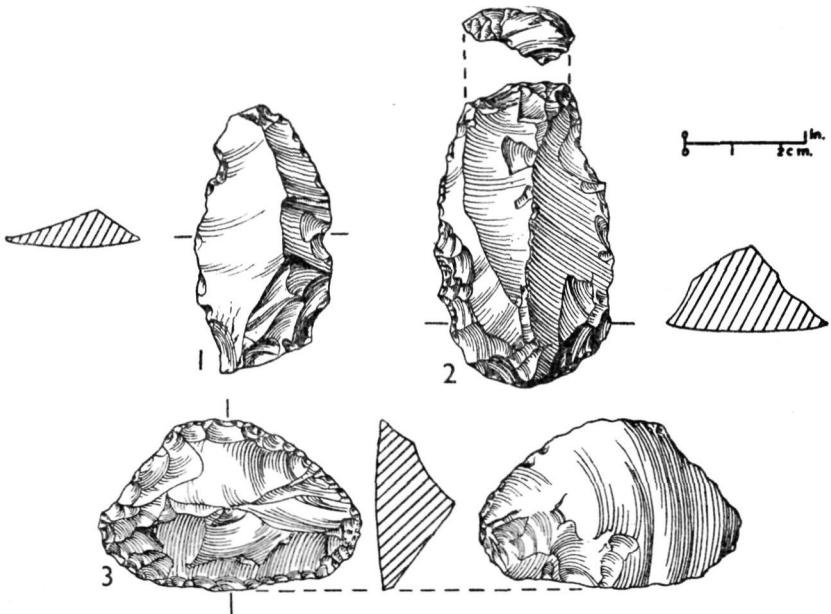


FIG. 5. Flint artifacts from Admiralty, Westminster.

likely that the significant artifacts were fashioned during the preceding Boreal period. In either case, however, the stratigraphy of their lie points to their being referable to Mesolithic industry. Were further confirmation needed, then Abbott's description of the constituents of the group and the facies of the surviving items supply it. Thus, after seventy years it seems that Abbott's discoveries at the Admiralty included one of value to studies of the Middle Stone Age.

5. DREDGING OF THE THAMES

(A) HISTORICAL

Collections other than those mentioned above also comprise distinctive objects that demonstrate the vigour of the Maglemosean penetration into our area. Even if these relics lack stratigraphical indications, *their number, facies and workmanship suggest a wide distribution of the Mesolithic industries and the influence of their tradition.* The exemplars of this are implements of stone, antler and bone made in true Baltic style. Like the remains already discussed, those to which attention is now paid were found in some fluvial connexion. The Thames is mainly concerned, but a few of its minor old or surviving tributaries are involved too, as well probably as vanished backwaters, marshes and fens.

Archaeologists ought to be grateful to a few authors who drew notice to these typical Mesolithic forms, *tranchets* and allied objects, found many years ago and now preserved in museums. Writing before their significance was quite understood, Mr. C. E. Vulliamy, for instance, described and illustrated several in a chapter⁴⁹ on the representation of New Stone Age culture in Middlesex and London. Before him Reginald A. Smith had commented at length⁵⁰ on certain artifacts retrieved from submerged ancient foreshores of the Thames. Several of these are relevant to the present theme, particularly since they derive from the left bank in the region comprised in this survey. The relics about which Smith wrote formed part of the omnibus collection amassed during his long life by Thomas Layton, of Brentford, who died a

nonagenarian in 1911. The importance of far more items in the immense assemblage, removed recently from Brentford Public Library to the London Museum, would be increased had not so many slips become detached from specimens, and had more details accompanied the antiquities upon which indications of provenance remain. Other collectors there have been, of course, but none of them or past students of finds from the Thames deserves higher tribute than G. F. Lawrence. Praise is especially due to him for having embodied his shrewd observations in a most useful paper.⁵¹ Lately a more comprehensive work by I. N. Hume⁵² has placed us in this author's debt, though his book hardly touches upon the Ages of Stone.

Many of the relics doubtless derive from such sites as are indicated by the comparable artifacts that have been found in stratigraphy. Most, however, considered by Vulliamy and others, as well as those examined recently, were dredged from the Thames in the days when the navigation channel was being widened and deepened, and when various operations connected with the construction of docks were under way. To some of the finds there clings a hard limy encrustation that testifies to a long sojourn on the river bed. Attrite ridges, blunted edges and smoothed surfaces distinguish several implements from sharp and fresh-looking counterparts, *e.g.*, figs. 6 and 7. This may be said of both stone and bony artifacts. Some examples, particularly bone-work, though less certainly catalogued, were probably recovered during the course of utilitarian excavations in alluvial deposits adjoining the main or tributary streams.

Along its course from Sunbury, some ten miles farther upstream than the highest tidal point at Teddington, to Woolwich, the Thames has yielded typical relics. Only those found on the near side of the river within our specified limits concern us here, but it must not be overlooked that about as many antiquities belong properly to the right bank and ought to be included in a more comprehensive work than this. Inspection of museum series reveals that a few stone, antler and bone implements were so vaguely labelled by the original collectors as to be of little value today as records. Notwithstanding, the groups shew that, besides the two places just named, the principal points of discovery along the left bank are:—Hampton and Kempton; Twickenham; Isleworth; Brentford, especially the dock and near it on the north side of Syon Reach called Old England; Chiswick; Hammersmith; Westminster. Kew appears to be particularly well represented, since many specimens in museums are simply labelled and catalogued as

from here, certainly after collectors' lists. Lawrence, however, with his unrivalled knowledge of finding-places and conditions along the Thames, makes it plain⁵³ that Kew Bridge on the Middlesex side was the place.

(B) STONE ARTIFACTS

When the relevant assemblages of stone artifacts in museums are examined the absence of flakes is at once apparent. The collectors of sixty-five and seventy-five years ago seemingly ignored such things and concentrated instead on the well-developed so-called Thames picks. Lawrence, however, in 1930 mentions pygmies from Eel Pie Island,⁵⁴ by which he may have meant microliths or simply small flakes and blades.

Many of the picks comply with *tranchet* standards in so far as they are flaked in rods of flint and terminate in the characteristic bezel. It cannot be doubted therefore that these implements are based on and are related to the Baltic tools of the kind noticed in our area at Harefield (above, p.121 and fig. 3, no. 15), and just outside it at Sandstone and Broxbourne. Like these in typical form and elliptical section, several *tranchets* of undoubted Mesolithic facies have been studied with the Thames picks that constitute a large part of the Sadler Collection in the Gunnersbury Park Museum, Acton, and of the Layton Collection now in the London Museum, in which institution the Lloyd Collection also counts examples. Flint *tranchets* and picks from the bed of the Thames are also housed in the British Museum, and a few of both sorts belonging to the Thames Conservancy Board Loan Collection are preserved in the Borough Museum, Reading.

The small collection of true *tranchets* of flint from the Thames figured, fig. 6, proclaims the identity of its ingredients. Simply labelled "Thames", the first, no. 1,⁵⁵ is shewn as being still sharp of edge, but with its ridges dulled and flake-scars made somewhat lustrous, probably by the action of water and sand. Patches of crust remain on this implement of pleasing brown hue. Equally typically bearing a marked cross-scar at their lower end, the two, nos. 2 and 3, retain their pristine freshness. From Old England, Syon Reach, Brentford,⁵⁶ no. 2 is slightly smoothed and stained light fawn with some incipient patination and corticated areas, one of which could help the grasp. Its unaltered companion no. 3, from Staines,⁵⁷ of light grey flint stained faint greenish-brown, is narrower and rounder, and therefore perhaps nearer the Thames picks, of which some of the finest known examples are represented here.

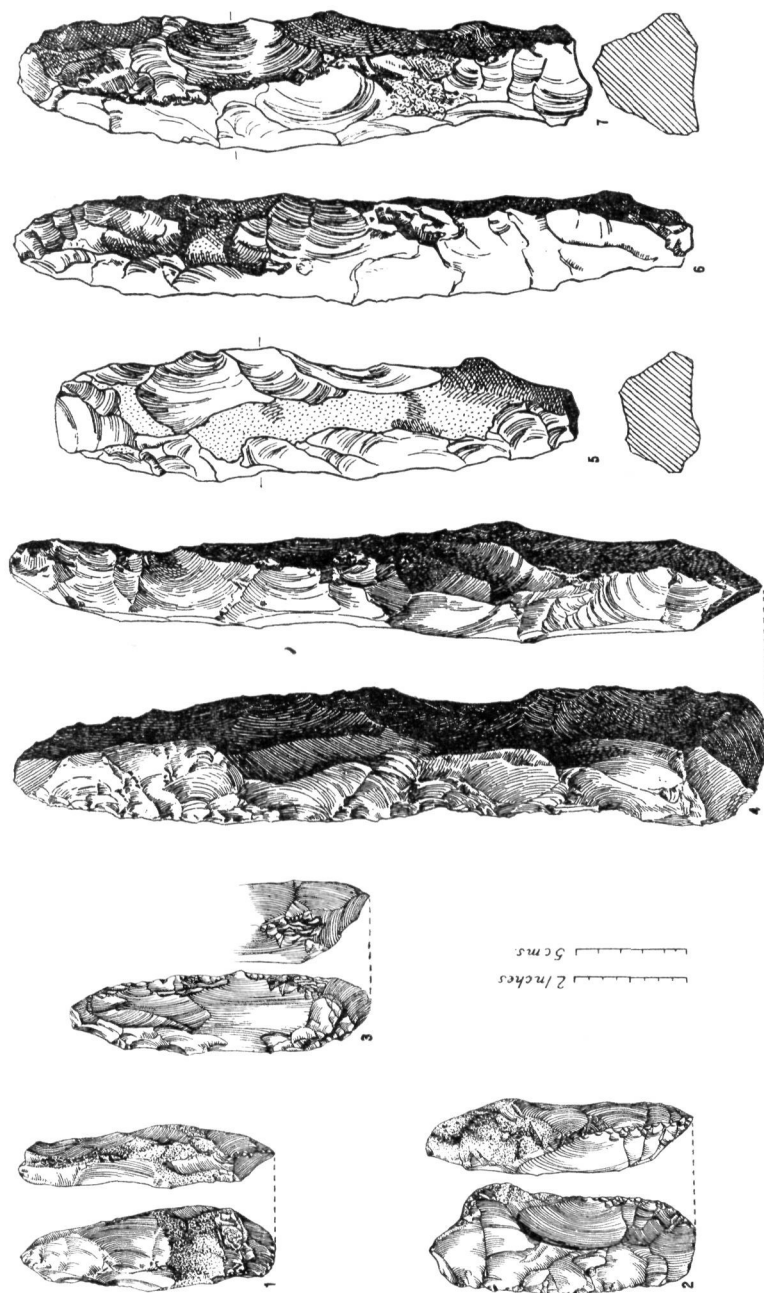


FIG. 6. Flint tranchets and Thames picks, dredged from the Thames: 1, 'Thames'; 2, Old England, Brentford; 3, Staines; 4, Brentford; 5, Teddington; 6, Isleworth; 7, Westminster. (No. 4 reproduced from Smith 1917-18 by permission of the Society of Antiquaries of London; Nos. 5-7, reproduced from Vulliamy 1930 by permission of Messrs. Methuen & Co., Ltd.)

Ordinarily long and narrow, sub-triangular or irregularly lozenge in section, but not elliptical like the *tranchet*, and occurring but very rarely in Denmark, the Thames pick may be regarded as a specialization peculiar to south-eastern England.⁵⁸ Not only does this form abound in the Thames valley, but on the South Downs particularly it is extremely common, since it persisted there so long as flint was used for making into tools. Although the Thames pick is normally a longer implement than the *tranchet*, quite exceptionally big specimens have been recovered from our main river. How these as type-forms differ and seem to develop from the *tranchet*, the illustrations shew. Conditions in the muddy and silty gravel and time have dealt kindly with the magnificent flaked flint from Brentford, fig. 6, no. 4,⁵⁹ and with its equally skilfully made but lesser associates from Teddington, no. 5,⁶⁰ Isleworth, no. 6,⁶¹ and Westminster, no. 7.⁶²

(C) ANTLER AND BONE ARTIFACTS

If the stone implements of Mesolithic aspect from the Thames are imposing despite the lack of details of discovery, the artifacts made in bony materials are equally impressive although usually as poorly documented. The range of these as implied by museums collections, however, is not as extensive as that of the stone tools.

Except for some small objects like ground and trimmed pieces of antler and bone encountered in most comprehensive series from Upper Palaeolithic to Bronze Age and even later, the relics in these substances are all characteristic of Mesolithic industry prevalent in Baltic lands during the Early Post-Glacial period. Not only so, but in the assemblages from our region Maglemosean rather than later features predominate. Dating, however, must be precarious, because specimens vary in condition and present many contrasts. Thus, firm, heavy, mineralized implements are matched by others that scale away to the touch. Again, some implements look quite fresh, which no doubt accounts for the attribution of a number to the survival of ancient traditions in early metal age workmanship.⁶³

The lower halves of denticulated bone points so typical of Maglemosean fishing-gear are among the best-known of prehistoric relics yielded by London's river,⁶⁴ but their finding-places, Battersea and Wandsworth,⁶⁵ lie outside our bounds. Just as distinctive, nevertheless, are several adze-like, a few axe-like and other implements fashioned in red deer antler from the left bank. Most of these tools appear un-

expectedly heavy and thick in section. This is because the antler of which they are made had graced animals of the kind that ranged over continental forests. These were far bigger beasts than their degenerate successors living today in parts of Britain.

The quota from the left bank includes an exceptionally long and massive tool of red deer antler with an adze-like working-edge and wide cylindrical perforation below the burr, fig. 7, no. 1. The state of this shews that the horn was shed naturally and not cut off a head. At right angles to the hole practised for the reception of a wooden haft the antler has been cut obliquely and ground to form the desired edge. This disposition, of course, distinguishes the adze-like instrument from the comparatively uncommon tool with its working-edge set axe-wise, that is parallel to the horizontal axis of the hole. The rarity of this form in Maglemosean bone and antler equipment has been commented on in a brilliant essay by the late Professor V. G. Childe.⁶⁶

Very regrettably the exact derivation of this splendid piece is not known, but it is thought to be Kew Bridge. Certainly the object had lain long at the bottom of the river, since a calcareous deposit adheres to its surfaces and fills recesses and cavities in the cancellated structure of the antler inside the perforation. A sample of this limy soil, or race as it is known to geologists, has proved richly polliniferous. Though interesting, of course, the count, for which we are indebted to the favour and skill of Mrs. Faith Topham, Mill Hill, would need to be supplemented by statistics of more samples and by other data. Nevertheless, it has to be noted that she ascertained that the pollens of hazel and pine predominate with respective percentages of 39 and 25.5. Willow comes next at 12%, followed by a 7% representation of maple, 5% of ash, a little less of elm, while birch shews as only 3%. Oak, if occurring at all, is insignificant, and a mere trace of alder has been detected. Mrs. Topham thinks she can discern the pollens of herbaceous plants such as commonly grow near water. The writer may be greatly mistaken and brought to task for putting to paper a seemingly hasty statement. Yet to him the reading of the pollen from inside the implement is not incompatible with a *Late Boreal* dating, with which the archaeological specimen could well on typology be contemporary or somewhat earlier.

A particularly fine, mineralized, but not quite so heavy example, with working-edge disposed axe-wise parallel to the main axis of the rather small perforation, no. 2, from the river at Twickenham⁶⁷ must, when complete, have resembled a magnificent adze of red deer

antler found with its wooden handle still in place in the Thames at Hammersmith. Illustrated by the late G. F. Lawrence⁶⁸ and acquired by the City of Liverpool Museums, this superb piece was lost with much else in an air-raid that during the last war destroyed the building in which the tool was kept.⁶⁹

Recorded from New Scotland Yard, Westminster, another heavy but shorter adze made in the horn of as big a stag is housed in the London Museum as a constituent of the rich Lloyd Collection.⁷⁰ That so well preserved a specimen should be the product of an industry as ancient as this tool seems to typify, is difficult to credit unless of course the relic was entombed in exceptional conditions. Figured in the first place, no. 3, for its *intrinsic beauty and fine execution, the implement* is all the more attractive by reason of its fine brown coloration. This it no doubt owes to the nature of the enclosing alluvial deposit connected with the stream beside which the tool probably served its owner. This was the small, northern and Thames-ward flowing stream, now covered, mapped as the eastern of the two channels of the Ty Bourne (Tyburn) that delimit the ancient Thorney.⁷¹ Among other places where such implements have been found Lawrence names: Eel Pie Island;⁷² the backwater at Brentford Ait,⁷³ $\frac{1}{2}$ -mile downstream from the rich site called Old England on the north shore of Syon Reach; Kew Bridge.⁷⁴ In the Guildhall Museum there is a find from the City that ought not to be overlooked. Closely resembling the New Scotland Yard antler tool in hue and workmanship, it is a particularly fine implement made in the same material⁷⁵ with a short working-edge lying parallel to a comparatively narrow elliptical holing for the haft, no. 4. The smoothed face of the burr suggests that this end served as a hammer. Although not really satisfactory on stratigraphy, the specimen was reported forty years ago by the late Frank Lambert.⁷⁶ With it from below the surface was a flint axe-head, also much rolled, in what may have been filling on a site excavated between the north side of Finsbury Circus and Eldon Street. From the record of an immediately underlying marsh deposit resting upon gravel it is tempting to see in the discovery some connexion with a sojourn of prehistoric man between the two southward flowing branches of the Walbrook.

There have been found similar artifacts but made in bone. No. 5, a heavy and injured example from Kew Bridge, is especially interesting because a bone of the extinct great ox (*Bos primigenius* Boj.) is involved.⁷⁷ Noted by Lawrence, it is now in the London Museum.⁷⁸

Some Mesolithic axe- and adze-like tools resembling those described here have been interpreted as mattocks for dealing with the fat and blubber on the carcasses and skins of large animals.⁷⁹ Quite acceptable as is this explanation of implements found associated with the remains of seals and whales in coastal and estuarine deposits, for instance in the Baltic area and the Firth of Forth, it may not be valid for the antler and bone objects from points so far up the valley of the Thames as some of the places named. Cetaceans and aquatic animals, however, were not the only bigger beasts that came into the ken of the Early Post-Glacial folk and their later Stone Age successors. The very rare antler and bone tools of the kinds discussed, found in such contexts as graves, may have been found and treasured but never used by the Neolithic and perhaps Bronze Age people who deposited them. Anyway, the author believes that to continue to call them hoes is unrealistic. For none of the specimens examined shews any signs of ever having been subjected to hard wear.

In addition to all these defined forms there have been collected stag's horn picks and other plain objects of the same substance and of ordinary bone at: Staines;⁸⁰ Old England, Brentford;⁸¹ Kew Bridge,⁸² and nearby at Strand-on-the-Green;⁸³ Hammersmith,⁸⁴ and Crab Tree;⁸⁵ Putney Bridge.⁸⁶ To them are to be annexed other kinds of perforated tools, some socketed, others not. Consisting of sleeves or holders and what have been regarded as simple hammers, they are significant relics. Whether or not some are much later than Mesolithic, all follow the fashion set by the outstanding culture of that age.

Only one of the two types of sleeves or holders made in short pieces of antler found at Maglemosean sites around the Baltic⁸⁷ has been noticed in Thames collections. A mineralized specimen, retaining the burr or crown and figured here, from Eel Pie Island, Twickenham,⁸⁸ fig. 7, no. 6, is characteristic of the Mesolithic device used in connexion with a stone or bone inset to serve as an axe or adze. A suitable stick pushed through the large perforation would of course form the haft and secure the other parts of the composite tool. From the river nearby, also at Twickenham, a comparable but imperfectly preserved component was retrieved and is now in the London Museum.⁸⁹ Another, but in excellent condition and rather vaguely labelled Kempton-Hampton, may be accepted as from farther upstream. None of these holders can be likened to the familiar tenoned sorts harvested in such numbers last century from the remains of the Swiss lake-dwellings.

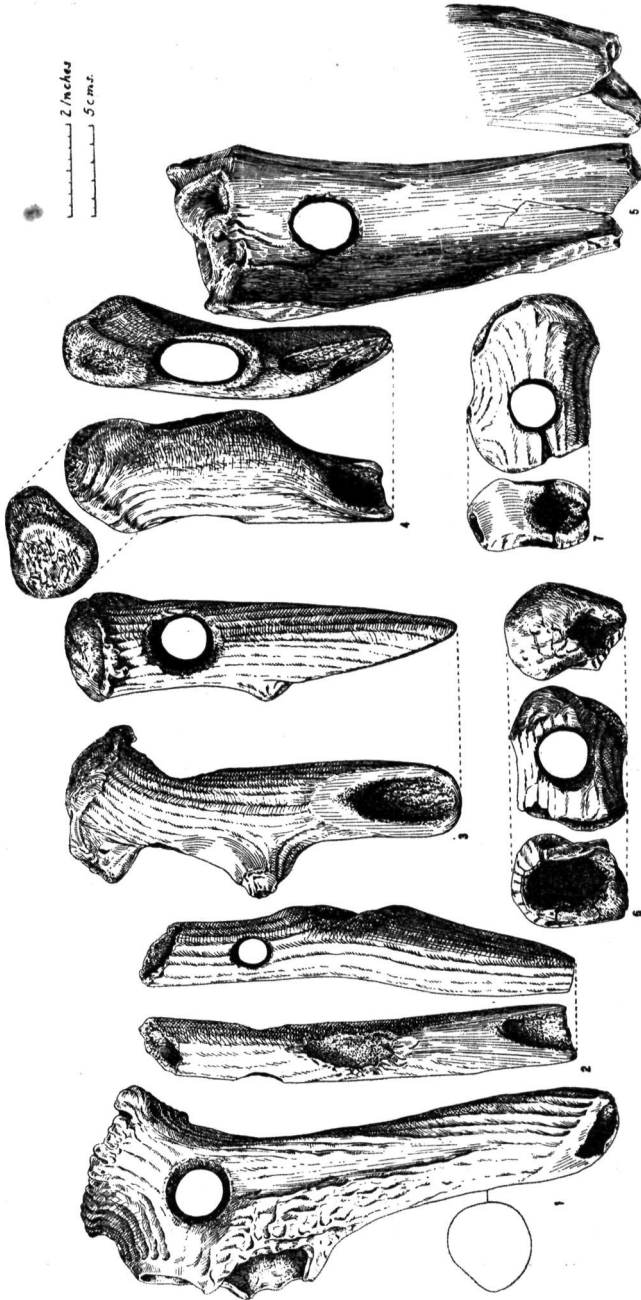


FIG. 7. Antler and bone artifacts: 1, supposedly from Kew Bridge; 2, Twickenham; 3, New Scotland Yard, Westminster; 4, Finsbury Circus, City; 5, Kew Bridge; 6, Eel Pie Island, Twickenham; 7, Isleworth. (Nos. 1 and 2, 5, 6 and 7, dredged from the Thames.)

A composite tool recorded by Lawrence from Hampton Court⁹⁰ has unfortunately not been traced. It is described as a horn hammer plugged in its open end with two bits of the same material.

Some perforated pieces of red deer antler are decidedly bruised in the same way as hammer-stones. In such typical specimens as no. 7, from Isleworth,⁹¹ which, now mineralized, cracked and peeling, at first sight looks like a sleeve, the inside has not been enlarged artificially to receive a stone or bone adjunct. Another may be cited from the foreshore at Brentford.⁹² On these relics the opinion might be expressed that they are unfinished implements. The abrasions that they bear, however, are too characteristic to leave room for doubt. Moreover, they are the counterparts of artifacts found in Maglemosean contexts in Baltic lands.⁹³

Partly made prehistoric tools are by no means uncommon. In respect of uncompleted bone-work from the Thames, Lawrence mentions a piece of red deer antler preparatively notched for breaking found at Staines,⁹⁴ whence he also records a stag-horn pick and a chipped adze.⁹⁵

(D) ORNAMENTED OBJECTS OF BONE AND ANTLER

Though all the artifacts considered in the foregoing bespeak the Mesolithic penetration into the London basin, and its legacy thereto, ultimately from Baltic lands, an implement from the Thames at Hammersmith, and now in the British Museum,⁹⁶ stresses even more the peculiarly Maglemosean aspects. Like the heavy bone tool from the Thames at Kew Bridge (above, p.134), and therefore not so remarkable in itself as a perforated and socketed holder, and differing from fig. 7, nos. 1-4 because executed in the radius of an ox, and not in antler, it is yet outstanding by reason of the ornamentation that it bears. This is well seen in the illustration intentionally shewing the severed distal end upper, fig. 8, no. 1. Evidently, after having been cut across, the bone was not brought to a working-edge, but the hollow was slightly treated for the reception of a fitting, probably a stone tool-head. The decoration appears on the face of the bone holder between the artificial hole and the narrow end. It is of the simplest, consisting of a pattern of chevrons incised doubtless with a thick-edged graver. Whether ornamented merely to the fancy of the executant, or engraved as an owner's mark, the *motif* is akin to that carved on an antler tine found in muddy sand mixed with gravel 20 ft. from the surface near Romsey, Hants. ⁹⁷

Whatever the reason behind this geometric line-ornament, and however regrettable that the engraved bone component from the river is only another loose find, the specimen nevertheless constitutes a further link with Maglemosean industries of the region in which they developed, and from which there spread during Boreal times the strains of the culture to which they belonged. Crude, too, as is the engraving on this object found within the Metropolitan area, it stands almost alone in England as an example of art credibly referred to people in a stage of pre-Neolithic culture.

Curiously enough, although Stone Age art is poorly represented in Britain, the left bank of the Thames in the area of this review has produced ornamented objects other than the holed bone from Hammer-smith. If these relics cannot be dated strictly, they are yet certainly made and treated after a style practised by the Maglemosean fishers, hunters and fowlers in the Baltic region. The things in question are three perforated short pieces of red deer antler which formed part of the Layton Collection.⁹⁸ One is a hammer from the river at Teddington,⁹⁹ no. 2, and now in the British Museum. Another, no. 3, a hollowed sleeve or holder, is noted as found at a depth of 13 ft. in *Windmill Lane*.¹⁰⁰ Experience of Layton's labelling would uphold Brentford as the main provenance, and the specific indication is believed to refer to what is now called *Windmill Road*. The point of discovery would therefore be the low ground bordering the edge of the left-bank alluvium of the River Brent in its last reach. Catalogued as of the same derivation, no. 4¹⁰¹ is not scooped out, and is either unfinished or was never intended to hold a component.

The claim of these objects to special notice resides in the ornamentation that they bear on the thicker end or burr, and in no. 2 at the opposite extremity also. In this and in no. 4 the artistic work has been injured, evidently from the use to which the tool was put. The design is the same in all three, but its execution differs. It takes the form of a faceted lattice pattern, closely resembling that incised on many Maglemosean bone and antler relics. Citing several from places in south Sweden and Denmark,¹⁰² Clark points out that the distinctive design may have suggested itself to people familiar with nets and net-making.¹⁰³ He shews variations of the scheme, but does not refer to examples treated in the manner of ours. On nos. 2 and 4 the design seems to have been executed by hollowing, and in no. 3 by rubbing the surface.

In the ornamentation of these three relics the symmetry achieved is remarkable, as if a net of small mesh had been stretched as a guide.

stencil or template over the part to be treated, in the way a housewife uses a darning ball, and the surface would then be pecked or rubbed down between the strings. Whatever the method adopted to produce it, the pleasing arrangement is certainly of Baltic Mesolithic origin. Though one cannot assert the age of the specimens illustrated here, no. 3 with the ground facets, if not all three (nos. 2, 3 and 4), may be of late Neolithic workmanship, or of the Bronze Age as Lawrence¹⁰⁴ seems to believe was the rightful attribution of so many of the perforated antler artifacts. R. A. Smith,¹⁰⁵ however, apparently preferred to regard as Neolithic these expressions of art upon the specimens under present discussion.

Certainly no. 3 of red deer antler might well be as late as Bronze Age. It is virtually identical with another implement from Hammer-smith,¹⁰⁶ and both have almost their counterpart in a perforated flint tool like a hammer-head from the Syon Reach, Brentford.¹⁰⁷ The face of no. 3, which is unblemished by wear, is just as profusely faceted to a reticulated pattern, the origin of which lies in such ornamented instruments as are here figured. Further, it is interesting to recall that elaborate, finished hammer-heads of stone exhibiting the same style of net-like ornamentation have come from localities as far apart as Corwen, Merioneth;¹⁰⁸ Bonar Bridge, Sutherland;¹⁰⁹ Urquhart, Moray;¹¹⁰ and Staffordshire.¹¹¹ A cruder example from the Thames at Windsor passed from the late F. Trees Barry to Sir John Evans about sixty-five years ago.¹¹²

6. SURFACE-FINDS

When inspecting collections the author has had his attention drawn to certain odd artifacts because they were labelled Mesolithic. Inquiry, however, has shewn that such objects were selected from sporadic surface-found flints. These had been turned up by the plough or spade and handed in at museums, perhaps long after discovery. Among them only two suggestive specimens have been remarked. One is a small, fine end-scraper on a parallel-sided blade, found in a garden in Connaught

Avenue, Enfield, and now exhibited in Forty Hall Museum there. The other consists of the greater part of a long blade with some steep edge-trimming. Picked up just fifty years ago at Winchmore Hill, it is now in the Bruce Castle Museum, Tottenham. These two implements are types encountered frequently in comprehensive and characteristic groups of Mesolithic manufacture and tradition, such as occur freely in so many open and upland areas.

Relics of industry indeed attest that hunting and migrant bands did not restrict themselves to a fenland environment. They would range beyond and also seek higher ground, and where this was treeless their equipment would tend to become lighter than in wooded areas. Since long before the Mesolithic period of man's cultural development the high ground and other territory, apart from that affected as described in the Colne and Lea Valleys, had not been subjected to any major natural change. This would of course militate against the formation of stratified beds. Hence it is not difficult to understand why the relics of successive

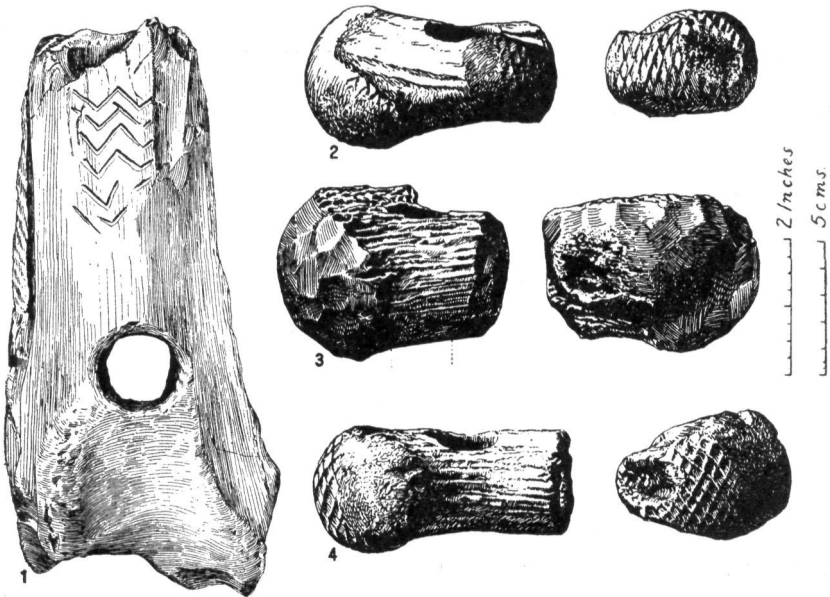


FIG. 8. Ornamented bone and antler objects: 1, Hammersmith; 2, Teddington; 3 and 4, Brentford. (Nos. 1 and 2 dredged from the Thames. Drawing of No. 1 supplied by British Museum, Bloomsbury; Nos. 2, 3 and 4, reproduced from Smith 1917-18 by permission of the Society of Antiquaries of London.)

generations of prehistoric folk became mixed on the surface of fields and heaths. This generalization excludes special circumstances of discovery such as working-floors, dwelling-sites, and so on, which had been occupied by people in only one stage of culture. Nor does it mean that objects found out of their proper context ought to be dismissed as of no account. Were it an inviolable rule that this should be so, then much of value to archaeological knowledge would be lost.

IV. CONCLUSIONS

1. The materials for standards and comparisons in this consideration of remains of Mesolithic character in Middlesex and London have been found in the valleys of the Colne and Lea tributaries of the Thames. They are the Holocene, or geologically Recent, alluvial beds which with their datable archaeological contents overlie late Pleistocene deposits.

2. The drainage of the River Thames and tributaries in Middlesex and London has yielded assemblages of prehistoric industrial relics of flint which in the light of present knowledge are referable to Mesolithic culture. This attribution is based on their mode of occurrence in the Holocene deposits and on the typology of certain forms of included artifacts. It permits of the assessing of some past finds from similar layers, forgotten until now or dismissed, and of assigning them to the Middle Stone or Mesolithic Age. By their aid the identification has been confirmed of remarkable objects discovered many years ago within and close to the area of the recent inquiries.

3. The oldest of the decisive antiquities found stratified in the Holocene deposits are stone implements believed to have been produced during the Boreal climatic phase and not later than the subsequent Early Atlantic, between say 7,000 and 8,500 years back. Among the artifacts there occur forms testifying to origins that lie in Maglemosean industries, Forest Culture Period II, developed in the Baltic basin. Thence over generations the Maglemosean strains reached south-eastern Britain by way of the upraised floor of the North Sea. Their carriers were nomadic food-collectors depending for their subsistence mainly on hunting, fowling and fishing. Such surroundings they enjoyed in the Baltic region, traversed on the extended European plain of Boreal times and found in the estuary of the Thames and in the lower reaches of the main river and of its tributaries. Crucial deposits prove that those conditions obtained in our own district.

4. Bearing the title it does, this survey must take account of certain relics because of their facies, although it cannot be asserted that the objects occurred in their proper context. Of these, the most numerous are flint artifacts. Among them, catalogued as Thames picks dredged from the Thames along the left bank, are true *tranchets* that are quite probably of Mesolithic age. They match examples found stratified in the alluvium of the tributary valleys of the Colne and Lea.

5. In museum collections of relics from our region there are several perforated axe- and adze-like implements, sleeves or holders, and hammers, made of bone and red deer antler. These antiquities are as characteristically treated in the Maglemosean manner as the most telling of the flints from the Holocene alluvial deposits. While not certainly recorded as found stratified, some of these bony objects are very likely of Mesolithic age.

6. To the same period of man's cultural development in what are now Middlesex and London credibly belongs one of the very rare examples of Stone Age art discovered in Britain. As a simple incised engraving on an ox-bone, it testifies as positively as do the implements to the penetration of Maglemosean influences into the basin of the Thames. If not so old-looking, other objects fashioned in red deer antler bear designs reminiscent of *motifs* cut on comparable artifacts produced at Maglemosean sites in Baltic lands.

7. Of multiple parentage, the Maglemosean culture that grew in the Baltic region derived chiefly from the Upper Palaeolithic of eastern Europe. So far, however, nothing indicates any connexion between the relics of its Mesolithic equivalent in Middlesex and London mentioned herein and the Upper Palaeolithic industries of England. However, in the course of the inquiries that have culminated in this compilation, a few artifacts from localities in Middlesex and London have been encountered that may conceivably be the product of industries earlier than Mesolithic.

8. It is unlikely that artifacts of Mesolithic facies can ever again be found in abundance along the main course of the Thames in our area. For the great period of discoveries was when the navigation channel was being deepened and widened. By attacking the ancient, silty, muddy and gravelly post-Pleistocene foreshores under water, these operations brought to light the contained relics of human industry. Between low-water and the deep channel the strip remains uncut, and is therefore a potential store of antiquities later than Mesolithic.

The lie from which the artifacts of Mesolithic facies were dislodged along the river was very possibly similar to that of the flaked *tranchets* and picks noted by the late Dr. W. Allen Sturge¹¹³ at various points on the lower Thames. He observed that normally these tools occurred lower down than polished implements, but in the upper levels of the gravel separated from the lower ballast by horizontal patches of compact peat. As the stone tools were ordinarily found unrolled, he concluded that they were roughly contemporaneous with the gravel at a date when the peat began to accumulate. Presumably this was

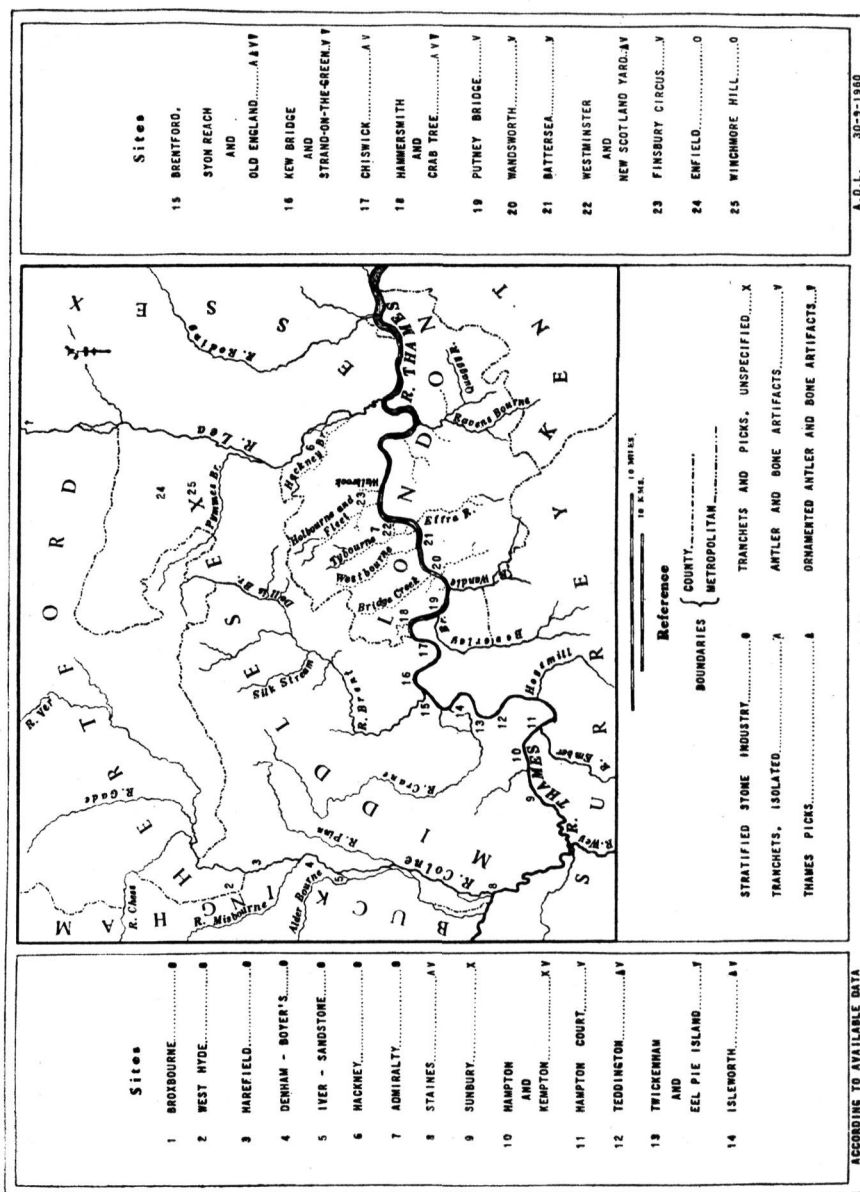


Fig. 9. Map indicating finding-places of Mesolithic type around London, mainly north of the Thames.

during the damp climatic conditions induced by the land-sinking and concomitant phenomena. This is no doubt equally applicable to many of the relics from the reaches with which the present communication has dealt.

9. The industrial and artistic traditions of the Mesolithic Age long persisted in the Middlesex and London area. They are manifest in a number of implement forms, notably that regional specialization, the Thames pick, and probably in some of the bone and antler tools with working-edges like those of axes and adzes, short sleeves as parts of composite tools, hammers and so on. That these traditions endured is no doubt due to the vigour and the depth of the penetration of Mesolithic culture, and to the recognition of the usefulness of the devices introduced by it during the Early Post-Glacial period.

10. Further investigations alone will shew how widely the Mesolithic industries spread in our region. A preliminary idea, however, may be had from the sketch-map, fig. 9, which indicates the principal finding-places of the antiquities of Mesolithic facies mentioned in the foregoing, and their relation to the streams of Middlesex and London.

This communication, summarizing the information obtained by the author, may suggest lines to follow. It is offered in the conviction that in backwaters of the Thames and in the basins of tributaries in Middlesex, in the Metropolitan area and their borderlands there is a virtually untouched field of much promise. To research workers practising the latest methods on the ground, and using the most modern techniques in the laboratory, it will assuredly bring its reward. Their work, it is hoped, will amplify and refine or correct many of the observations advanced in these pages.

ACKNOWLEDGMENTS

But for the valued assistance afforded the author this communication would have fallen short of the demands imposed by a subject that even now has been treated summarily. Throughout the investigations leading to this production he has been touched by the readiness to help shewn by all whom he has approached.

Besides those mentioned in the text, F. N. Haward and J. G. Marsden, both deceased, are remembered with emotion for their guidance many years ago in a field that was virtually unconsidered except by a few pioneers.

Those to whom the writer is beholden for leave to examine the ground and explore sites include:—the Southern Division of the Central Electricity Generating Board; the British Transport Commission, as represented by the Western Region of British Railways in the persons of Messrs. F. C. Vincent, D. C. Sansom and Inspector Gent at Brentford Dock Goods Station, and by the British Transport Waterways, South Eastern Division, Watford; Messrs. John Hawtrey and Co., Ltd., Harefield, and in particular Mr. M. Kendall; Sanderson Fabrics (Messrs. Arthur Sanderson and Sons, Ltd.), 100 Acres, by Uxbridge. In the same connexion thanks are due to Mr. R. N. Uren, Dewe's Farm, Harefield.

It is a pleasure to record indebtedness to friends in museums and libraries, who put material at the disposal of the author for study and illustration. Not only so, but several also generously imparted much useful information based on local knowledge. Among these ladies and gentlemen are: Messrs. R. Bruce-Mitford and G. de G. Sieveking, British Museum, Bloomsbury, who also kindly provided a drawing; Dr. A. J. Sutcliffe, British Museum (Natural History), South Kensington; Dr. D. B. Harden, O.B.E., London Museum, Kensington Palace, and his collaborators Mr. Brian Spencer, Mr. James Barber and his wife (formerly Miss Jennifer Clark), who with infinite patience sought out specimens and data connected therewith; Messrs. Norman C. Cook and Ralph Merrifield, Guildhall Museum, London; Messrs. Vernon Bore and Alexr. Grant, Broomhall Museum, Southgate; Miss Elizabeth A. Flint, Bruce Castle Museum, Tottenham; Mr. F. J. Gosling, Central Library, Enfield, and his assistant at Forty Hall Museum, Mr. J. Smith; Mr. H. V. Radcliffe, Gunnersbury Park Museum, Acton, who also

went to great pains to clarify doubtful indications; Mr. H. Wilson, Central Library, Borough of Hackney, and his deputy and reference librarians, Mr. C. J. Long and Mr. C. D. Johnson respectively.

Cordial thanks are extended to Dr. Ian W. Cornwall, University of London Institute of Archaeology, for some useful suggestions that have been followed, and to Dr. F. W. M. Draper, Muswell Hill, for much helpful information for north and east London.

To the Wellcome Foundation Limited deep gratitude is expressed for continuous and unstinted aid in the earlier stages of the long inquiries that have led to the writing and illustrating of this article. Especially is the author most grateful to Dr. E. Ashworth Underwood, Director of the Wellcome Historical Medical Museum, for granting all facilities to carry out field-work, study and figure objects, many among the possessions of that institution, and also for his kindness, encouragement and interest. Recent awards by the Trustees of the late Lord Leverhulme and by the Pilgrim Trust of the British Academy are very thankfully acknowledged, for they have permitted of the expanding of this paper and now enable him to widen the field of his researches.

Lastly, tribute is paid to Miss M. O. Miller, now at the British Museum, for the skilful drawings that embellish these pages.

REFERENCES

- 1 So called from the Danish *magle mose*, "big bog."
- 2 In no sense does this detract from the wonderful site discovered by Mr. J. W. Moore at Star Carr, Seamer, Yorks., and so ably excavated and brilliantly studied by Professor J. G. D. Clark.
- 3 S. Hazzledine Warren, J. G. D. Clark, H. and M. E. Godwin, and W. A. Macfadyen, "An Early Mesolithic Site at Broxbourne sealed under Boreal Peat," in *Journ. Roy. Anthropol. Inst.*, vol. lxiv, 1934, pp. 101-28.
- 4 E.g., J. G. D. Clark, *The Mesolithic Age in Britain*, Cambridge, 1932, p. 67.
- 5 A. D. Lacaille, "Pre-history at Iver Sub.," in *Southern Beam* [the magazine of the Southern Division of the Central Electricity Generating Board], Portsmouth, vol. 10, no. 7, April 1959, pp. 18-21, and *ibid.*, no. 8, May 1959, pp. 10-14.
- 6 Pollen-analyses and letter from Dr. G. F. Mitchell, Department of Archaeology, Trinity College, Dublin, February 2, 1956.
- 7 J. Allen Howe and E. W. Skeats, "Excursion to Denham and Gerrard's Cross. To the New Cutting on the Great Western Railway," June 13, 1903, in *Proc. Geol. Assoc.*, vol. xviii, 1903-4, pp. 188-90.
- 8 M. A. C. Hinton and A. S. Kennard, "The Relative Ages of the Stone Implements of the Lower Thames Valley," *ibid.*, vol. xix, 1905-6, p. 95.
- 9 J. G. D. Clark, *The Mesolithic Settlement in Northern Europe*, Cambridge, 1936, pp. 25, 31 and 220.
- 10 *Mem. Geol. Survey*, The Geology of the London District . . . , second edition, 1922, pp. 76-8.
- 11 On these developments the reader may profitably consult F. C. J. Spurrell's "Early Sites and Embankments on the Margins of the Thames Estuary," in *Archaeol. Journ.*, vol. xlii, 1885, pp. 269-302.
- 12 Clark, *op. cit.*, 1936, pp. 25, 31 and 221.
- 13 J. P. T. Burchell, "The Shell-mound Industry of Denmark as represented at Lower Halstow," in *Proc. Prehist. Soc. East Anglia*, vol. v, pt. i, 1925, pp. 73-78; *idem*, "Further Report on the Epi-Palaeolithic Factory Site at Lower Halstow, Kent," *ibid.*, vol. v, pt. ii, 1927, pp. 217-23; *idem*, "A Final Account of the Investigations carried out at Lower Halstow, Kent," *ibid.*, vol. v, pt. iii, 1928, pp. 288-96.
- 14 W. B. R. King and K. P. Oakley, "The Pleistocene Succession in the Lower Parts of the Thames Valley," in *Proc. Prehist. Soc.*, vol. ii, 1936, pp. 52-76.
- 15 *Mem. Geol. Survey*, *cit. supra*, 1922, p. 70.
- 16 Hinton and Kennard, *op. cit.*
- 17 Among the works that may be cited are:—S. H. Warren, "A Late Glacial Stage in the Valley of the River Lea subsequent to the Epoch of River-Drift Man." [With reports on the Organic Remains and on the Mineral Composition of the Arctic Beds by various Authors.] *Quart. Journ. Geol. Soc.*, vol. lxxviii, 1912, pp. 213-51; *idem*, "Further Observations on the Late Glacial, or Ponder's End, Stage of the Lea Valley." With notes on the Mollusca, by A. S. Kennard and B. B. Woodward, *ibid.*, vol. lxxi, 1916, pp. 164-82; *idem*, "The Late-Glacial Stage of the Lea Valley (Third Report)." With Appendix on the Arctic Flora by Mrs. E. M. Reid, and Miss M. E. J. Chandler. *ibid.*, vol. lxxix, 1923, pp. 603-05; J. F. Hayward, "Certain Abandoned Channels of Pleistocene and Holocene Age in the Lea Valley, and their Deposits," in *Proc. Geol. Assoc.*, vol. lxxvii, 1956, pp. 32-63.
- 18 Henry Woodward quoted in *Mem. Geol. Survey*, *cit. supra*, 1922, p. 75.
- 19 London N.W., Sheet 160.
- 20 Watford, Sheet 106.
- 21 King and Oakley, *op. cit.*, pp. 68-9.
- 22 *Ibid.*

- 23 Clement Reid, *Submerged Forests*, Cambridge, 1913, p. 17.
 24 King and Oakley, *op. cit.*, p. 69.
 25 *Ibid.*, pp. 69-70.
 26 M. A. C. Hinton, *Rivers and Lakes*, London, 1924, p. 71.
 27 A. S. Kennard in Howe and Skeats, *op. cit.*, pp. 188-189; King and Oakley, *op. cit.*, 1936, p. 69.
 28 Warren, *op. cit.*, 1912, p. 227.
 29 Mentioned by the courtesy of the finder, Mr. John Wymer, Borough Museum, Reading, before the publication of his "Excavations on the Mesolithic Site at Thatcham, Berks.—1958," in *Berks. Archaeol. Journ.* vii, 1959, [pp. 1-33] pp. 19-20.
 30 J. G. D. Clark in Warren, Clark, Godwin, Godwin and Macfadyen, *op. cit.*, 1934, p. 115; *ibid.*, fig. 7, no. 101; *ibid.*, fig. 8, no. 108.
 31 Clark, *op. cit.*, 1932, xix.
 32 Dated Edinburgh, March 15, 1955.
 33 Burchell (*opp. cit.*), 1925, 1927 and 1928.
 34 Clark, *op. cit.*, 1932, pp. 160-1.
 35 "Excursion to Homerton," in *Proc. Geol. Assoc.*, vol. viii, 1883-4 [1885].
 36 J. E. Greenhill, "The Implementiferous Gravels of North-East London," *ibid.*, pp. 336-43.
 37 *Idem*, "Prehistoric Hackney," Paper i, 1881; *ibid.*, Paper ii, 1883: typescript copies of lectures to the Hackney Microscopical and Natural History Society, Hackney Central Library, P. 89.G.
 38 Mrs. A. R. Hatley's notes on the local archaeological collection in Hackney Central Library, No. L. 145.
 39 Clark, *op. cit.*, 1936, pp. 105-6, and fig. 38, no. 4.
 40 W. J. Lewis Abbott, "The Section exposed in the Foundations of the New Admiralty Offices," in *Proc. Geol. Assoc.*, vol. xii, 1892, p.p. 346-56.
 41 Warren, *op. cit.*, 1912.
 42 W. J. Loftie, *A History of London*, London, 1883, vol. i, map facing p. 1. and vol. ii, p. 34.
 43 Wellcome Historical Medical Museum Accession no. 255781.
 44 Wellcome Historical Medical Museum Accession no. 255777.
 45 Wellcome Historical Medical Museum Accession no. 255780.
 46 W. J. Lewis Abbott, "Implements from Cromer Forest Bed and the Admiralty Section," in *Proc. Prehist. Soc. East Anglia*, vol. iii, pt. i, 1918-19 [pp. 110-14], p. 114.
 47 Hinton and Kennard, *op. cit.*, p. 95.
 48 Abbott, *op. cit.*, 1918-19, p. 112.
 49 C. E. Vulliamy, *The Archaeology of Middlesex and London*, London, 1930, chap. iv.
 50 "Specimens from the Layton Collection, in Brentford Public Library, described by Reginald A. Smith, Esq., F.S.A.," in *Archaeologia*, vol. lxxix, 1917-18 [1920], pp. 1-30.
 51 G. F. Lawrence, "Antiquities from the Middle Thames," in *Archaeol. Journ.*, vol. lxxxvi, 1929 [1930], pp. 69-98.
 52 Ivor Noël Hume, *Treasure in the Thames*, London, 1956.
 53 Lawrence, *op. cit.*, p. 81.
 54 *Ibid.*, p. 74.
 55 Sadler Collection, Gunnersbury Park Museum, no. 925/2400.
 56 London Museum no. 44.107.58.
 57 London Museum no. 49.107.75.
 58 Clark, *op. cit.*, 1936, pp. 158-9.
 59 Smith, *op. cit.*, 1917-18, p. 2, fig. 1, and pp. 2-3.
 60 Vulliamy, *op. cit.*, p. 68, fig. 11, C, and p. 69.
 61 *Ibid.*, fig. 11, B, and p. 69.
 62 *Ibid.*, fig. 11, A, and p. 69.
 63 Lawrence, *op. cit.*, *passim*.

- 65 London Museum, Lloyd Collection no. 897.
 66 V. Gordon Childe, "The Forest Cultures of Northern Europe," in *Journ Roy. Anthropol. Inst.*, vol. lxi, 1931, p. 327.
 67 London Museum, Layton Collection no. 902.
 68 Lawrence, *op. cit.*, pl. viii, B, facing p. 86.
 69 Letters from Miss Elaine Tankard, Keeper of Archaeology, City of Liverpool Public Museums, dated Carnatic Hall, Liverpool, 18, September 8 and 14, 1959.
 70 London Museum no. 49.85
 71 Loftie, *op. cit.*, vol. i, map facing p. 1, and vol. ii, pp. 33-5.
 72 Lawrence, *op. cit.*, pp. 76-7.
 73 *Ibid.*, p. 81.
 74 *Ibid.*
 75 Guildhall Museum no. 10, 561.
 76 Frank Lambert, "Some Recent Excavations in London," in *Archaeologia*, vol. lxxi, 1921, p. 94.
 77 Lawrence, *op. cit.*, p. 81.
 78 London Museum no. 27555.
 79 J. G. D. Clark, "Whales as an economic factor in Prehistoric Europe," in *Antiquity*, vol. xxi, 1947, pp. 84-104.
 80 Lawrence, *op. cit.*, pp. 74-5.
 81 *Ibid.*, pp. 79-80.
 82 *Ibid.*, p. 81.
 83 *Ibid.*, p. 82.
 84 *Ibid.*, p. 86.
 85 *Ibid.*, p. 88.
 86 *Ibid.*, pp. 89-90.
 87 Clark, *op. cit.*, 1936, p. 112.
 88 London Museum no. 49.67.
 89 Ditto. Lloyd Collection no. 923.
 90 Lawrence, *op. cit.*, 1930, p. 75.
 91 London Museum no. 924.
 92 Ditto. no. 49.53.
 93 Clark, *op. cit.*, 1936, p. 112.
 94 Lawrence, *op. cit.* p. 74.
 95 *Ibid.*
 96 *Ibid.*, p. 81; Reginald A. Smith, "Examples of Mesolithic Art", in *The British Museum Quarterly*, no. 121, vol. viii, no. 4, 1934, pp. 144-5 and pl. xlvi; 6. Specimen bears British Museum no. 1927. 7-73.
 97 Smith, *ibid.*
 98 Smith, *op. cit.*, 1917-18, pp. 6-7.
 99 *Ibid.*, fig. 7, p. 6.
 100 London Museum no. 0.1154.C.
 101 Ditto. no. 0.1154.D.
 102 Clark, *op. cit.*, 1936, pp. 168, 170-1 and 174.
 103 *Ibid.*, p. 170.
 104 Lawrence, *op. cit.*, p. 96.
 105 Smith, *op. cit.*, 1917-18, p. 7.
 106 Lawrence, *op. cit.*, p. 86 and pl. viii, A. 1; London Museum no. 13929.
 107 *Ibid.*, p. 80 and pl. viii, A. 2.
 108 Sir John Evans, *The Ancient Stone Implements, Weapons and Ornaments of Great Britain*, second edition, London, 1897, p. 226.
 109 V. Gordon Childe, *The Prehistory of Scotland*, London, 1935, pp. 100-1.
 110 Evans, *op. cit.*, p. 226.
 111 Childe, *op. cit.*, 1935, p. 101.
 112 Evans, *op. cit.*, p. 227.
 113 *Proc. Soc. Ant.*, vol. xxx, 1918, p. 31.