

# MESOLITHIC INDUSTRIES BESIDE COLNE WATERS IN IVER AND DENHAM, BUCKINGHAMSHIRE

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## I. INTRODUCTION

FOR well over thirty years the author has been studying Old Stone Age antiquities assignable to different Lower Palæolithic divisions and their mode of occurrence in the Pleistocene deposits of south-east Buckinghamshire. On these relics he has published some articles embodying his observations and the conclusions he has drawn from them. Most of the information has been obtained in commercial excavations for gravel and brickearth on the ancient terraces of the Thames, including Taplow and Burnham Beeches and as far downstream as the River Colne that separates our county from Hertfordshire and Middlesex. In this border region, particularly, workings in the valley of the Colne have afforded infinitely better opportunities than any diggings in that of the main river for examining the late Pleistocene flood-plain gravel and its Holocene or Recent overburden of alluvium. This comprises the post-glacial deposits of shell-marl, peats, sands, silts and muds. Where there has been no interference with nature the top soil on these sediments variously supports marshland plants, grasses, ferns, heath, sedges, scrub and small trees.

The basal flood-plain gravel has yielded many bones of the late Pleistocene fauna that in archæological chronology would be referred to the end of the Upper Palæolithic division of the Old Stone Age, but so far no contemporary organic or unambiguous industrial remains of man. There is, however, the abundant evidence of stone implements to show that between Upper Palæolithic times and the Neolithic, or New Stone Age, human bands were active beside the waters of the Colne. For, from sites on the low grounds drained by them, there have come two decisive assemblages of Mesolithic, or Middle Stone Age, artifacts. These the writer attempts to estimate in the following sections.

True, the groups have been glimpsed, but not until now has it been possible to consider them in detail. The first that was found can be assessed only after the later-discovered has been reviewed. For this provides standards for comparisons, since its components result from archæological excavations that also provided materials for an approximate dating by pollen-analysis.

Obliterated today, the two prehistoric sites dealt with in these pages are  $1\frac{1}{2}$  mile apart, one in Iver parish at Sandstone, south of Uxbridge, the other

in Denham within the 100-Acres east of Willowbank, west by north of Uxbridge. They are the two most southerly among several finding-places over a stretch of five miles from north to south, which includes West Hyde in Hertfordshire and Harefield in Middlesex.

## II. THE ENVIRONMENT

### THE CHANNEL OF THE RIVER COLNE

The map, Fig. 1, showing the position of the sites in and near this south-eastern extension of Buckinghamshire, gives an idea of the complicated hydrographic system between Rickmansworth in the north and Iver-Yiewsley in the south. For this confusion man has been greatly responsible. Although the Colne valley itself has not sensibly altered since late Pleistocene times, natural minor changes have been the forming and filling of subsidiary channels. It is, however, to widespread and ever-increasing operations for winning the water-bearing flood-plain gravel by great modern machines that are due local widening of the river and its expansion into meres and ponds. Human agency is also the cause of manifold connecting ditches and leets linking with meanders of the streams and with the Grand Union Canal. Equivalentents of all these affect the River Lea over a corresponding length. For this has been similarly disturbed by man; only his cutting and deepening of water-ways and construction of great reservoirs in the Lea valley has made up for less intensive commercial extraction of gravel.

The flood-plain gravel in the main and both these tributary valleys fills the principal and subsidiary buried channels which were gouged out during the fourth glaciation. Banked locally against the Taplow Terrace, this gravel encloses sands, loams and peat. The animal bones which have been mentioned, and the plant remains taken from these basal materials, sometimes at a great depth in the wet pits and other works, indicate that by the time the channels were fully charged there prevailed a climate cooler than the present. This, of course, proclaims the Upper Palæolithic age of the infilling and its floral and faunal ingredients.

### THE ALLUVIAL DEPOSITS

The alluvium, topping the gravel and demonstrably of post-glacial formation, is irregular and varies in thickness. Also owing to local erosion and deposition, the constituting beds, in spite of resemblance, may be of different ages within the Holocene period. In a minor way, too, where domestic and other refuse has been laid upon them, and where cultivation has broached the uppermost, the sequence has been supplemented or altered. Normally, however, the Holocene materials are well-defined, occurring as layers of peat, shell-marl and muds. The basal gravel is often overlaid with firm, heavy, black peaty matter containing small pebbles in its lower part. Dried in the open air it becomes as hard as stone. Lighter peat and peaty soil locally rest upon this or replace it. All these peaty deposits entomb tree-stools, bits of branches and other plant remains, also some bones of animals. A consideration of this goes far to explain why a range of man's relics of industry from Mesolithic to

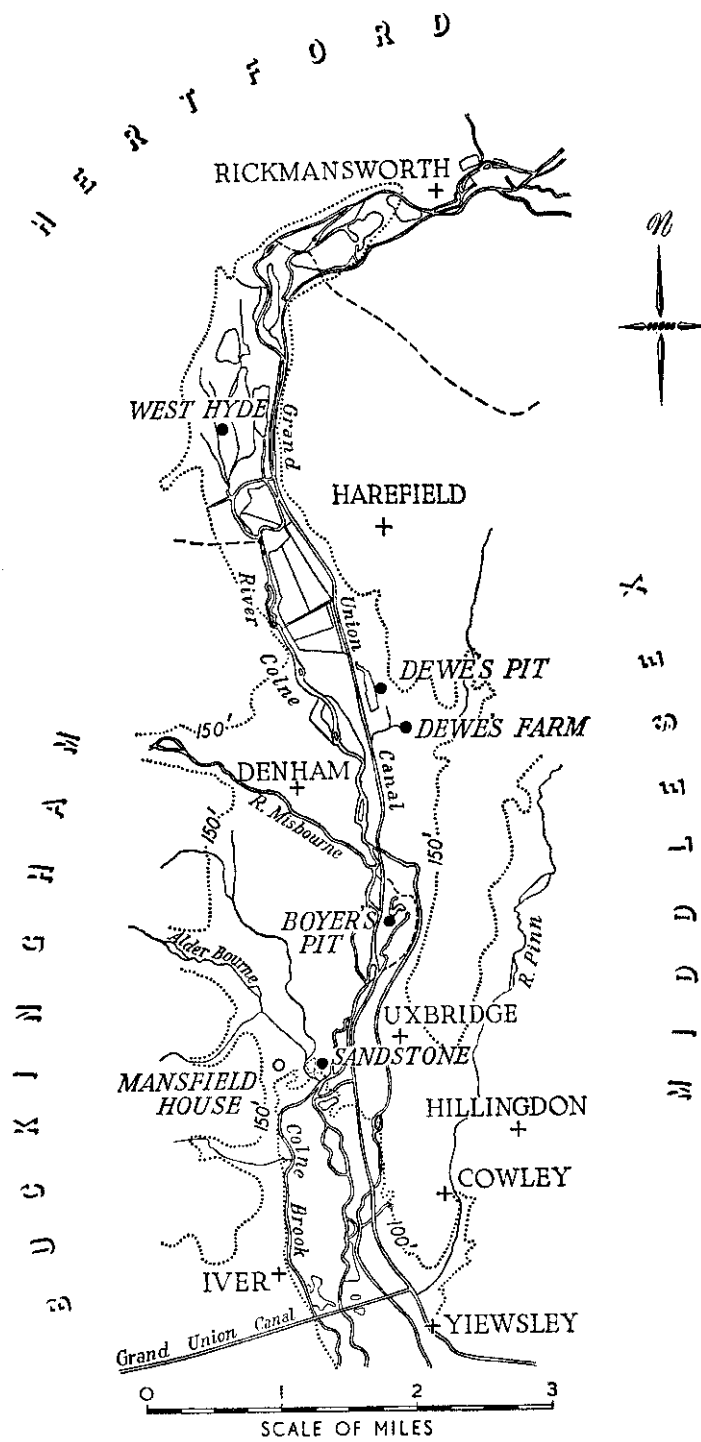


FIG. 1. The Colne valley between Rickmansworth and Yiewsley, with Mesolithic sites shown by spots.

Roman, and even later, has been recovered from deposits on top of the flood-plain gravel. Indeed, the late S. Hazzledine Warren has assigned some alluvial layers in the Lea valley to the historic period and even to our own day on the strength of their archæological contents,<sup>1</sup> which means a span of many thousands of years. This has been much the present author's experience in his study of the older antiquities and in his endeavours to determine their stratigraphy in the part of the Colne valley that now concerns us.

#### LAND MOVEMENTS

The significant alluvial deposits, which belong to the history of the Thames basin, record the changing relationships between land and sea since late Pleistocene times. Downstream from London they fill a subsidiary course eroded out of the lower (i.e., late Pleistocene) gravel that occupies the main channel of the Thames. At places this alluvium to a thickness of 15 ft. has been determined to lie 60 ft. below O.D., peat, its lowest constituent, being separated by sand and gravel, together 10 to 20 ft. thick, from the basal chalk. An uplift of the land above present level to about 80 ft. is therefore suggested. Since the river had again to cut down to reach base-level, this fact gives an idea of the amount of subsequent re-elevation.

While the same order of Holocene deposits broadly holds in the lower reaches of the tributaries as in the estuary of the Thames, allowance must be made for the decreasing effects upstream of changes in base-level. In the case of the Colne the ascertainable limit of the post-glacial natural deepening is thought to be in the neighbourhood of London Colney, just above 220 ft. O.D. From here to Uxbridge down-valley the river falls to 115 ft., and then to 50 ft. at its confluence with the Thames at Staines, a total distance of 25 miles. Altogether this means about 7 ft. per mile. Hence it is that going upstream one sees that the gravel rises above present water-level at an increasing number of points, forming ridges, banks and even islets.

The process of renewed erosion in a period of land elevation can be referred to the Pre-Boreal climatic phase of post-Pleistocene or post-glacial times. It continued in mildening conditions until the succeeding Boreal climatic phase. By then the resulting extension of the maritime tracts in south-eastern England and the emergence of the North Sea floor had so developed that land-bridges were created, enabling Mesolithic migrants from the European continent to enter the Thames basin. Later the sea regained its mastery, and Boreal conditions gave way to those of the Atlantic climatic phase of maximum post-glacial warmth. This witnessed the severing of the land-connexions that had been established earlier, the distension of the Thames estuary, the inundation of the lower reaches of the Colne, Lea and other tributaries, and the filling of inner buried channels.

With these phenomena our present island history began. It is the pauses in the process of drowning the wide parts of the tributary valleys that are registered by the alluvium composed of the peats, shell-marl and muds of different ages. In driving through them to win the flood-plain gravel beneath, the utilitarian workings have revealed embedded antiquities. The recognition of the oldest by pioneer inquirers in the realm of Stone Age researches has

led to their being studied attentively and to the archæological excavations mentioned in the sequel.

No series of beds recording the complete sequence of post-Pleistocene events is known to the author from the borders of Buckinghamshire, Hertfordshire and Middlesex. However, the succession could no doubt be ideally drawn by linking the principal layers observed at different places and bringing them into the upper part of the framework of Professor W. B. R. King's and Dr. K. P. Oakley's scheme for the Thames valley.<sup>2</sup>

#### THE POST-GLACIAL CLIMATE AND MESOLITHIC CULTURE

Before estimating properly the Mesolithic industries from the Colne-side stations in Iver and Denham, it has been necessary to give the student some notion of the environmental background. So, too, for his understanding of their archæological significance, stress has now to be laid on certain aspects of the period embracing the Pre-Boreal, Boreal and early Atlantic climatic phases. It was during the second of these that the great Mesolithic Maglemosean culture, derived from eastern European Upper Palæolithic strains, attained the peak of its development. This was expressed in the comprehensive stone, bone, antler and wood industries that answered needs in a mode of life differing mainly environmentally, but not fundamentally, from that of countless generations of Old Stone Age forerunners who foraged for their sustenance. From their small encampments in moors and fens, and on islands in lakes and watercourses the food-collecting bands were particularly active around the great fresh-water Ancylus Lake. This body then occupied the Baltic depression while the sea-level outside was low and the European plain extended westward, affording the above-mentioned land-connexions with Britain. As is shown by the analysis of pollen in peat enclosing Maglemosean relics in the area where the producing culture was cradled, among forest trees birch (*Betula*), hazel (*Corylus*) and pine (*Pinus*) predominated. This and other means of dating indicate that the Maglemosean culture ranged from the late Pre-Boreal, after say 8000 to about 5000 B.C., when the transition took place from the Boreal to the Atlantic phase. Professor J. G. D. Clark has related the three main groups of Mesolithic cultures that arose in the Baltic region to the various evidences of these phenomena, and particularly to the spread of the different forest trees. Subdividing them in terms of the natural chronology, he places the Maglemosean industries as belonging to Forest Culture Period II.<sup>3</sup>

Northern Denmark and other Baltic territories were profoundly affected by the changes brought about by the general expansion of the sea that has been referred to in the foregoing section. Overflowing and eventually breaking the sill that enclosed the Ancylus Lake, the waters of the North Sea poured into the Baltic trough, converting the great fresh-water body into a sea of increasing salinity, depth and spread. Thus the Litorina Sea came into being as the immediate predecessor of the present Baltic Sea. To the changing environment, created by the land-sinking and coincident marine expansion, the food-gathering Maglemosean folk adapted themselves and their equipment under a climate of increasing warmth and moisture. The pollen-analysis of peats from sites in the area and in the British Isles also attests that these

conditions promoted the growth of alder (*Alnus*) and the development of the Mixed-Oak-Forest (*Quercetum mixtum*) to the detriment of birch, hazel and pine. To the material culture which now grew out of the Maglemosean in Baltic lands, and which eventually included the production of rude pottery, the name Ertebølle (Forest Culture Period III) has been given.<sup>4</sup>

The present outlines of the Baltic Sea and of our coasts in south-eastern England result from a contemporary emergence that began to operate soon after the Litorina Sea, its counterparts outside and equivalent marine invasions and concomitant estuarine distensions attained their maximum and the post-glacial climate its optimum during the first half of the Atlantic phase, between *ca.* 5000 and 3500 B.C. Since, there have been minor intermittent sinkings and uplifts of the land which have not been without effect on the shores and estuaries of north-western Europe, including these islands. These movements are registered by various littoral formations and deposits, and along the tributaries of the lower Thames by certain alluvial sediments that are of course supplementary to those that record the main post-Pleistocene episodes briefly related above. Such are some of the deposits which have been studied in the valley of the Lea, and which in the corresponding lower reaches of the Colne await the attention of geologists and palaeobotanists.

### III. SANDSTONE, IVER

#### FIRST DISCOVERIES

Between the two world wars the late S. Hazzledine Warren, to whom the prehistory of south-eastern England owes so much, found a prolific flint-flaking floor upon the flood-plain gravel of the River Lea at Broxbourne, Herts.<sup>5</sup> The facies of the artifacts produced here, with the fact that they occurred under peat determined by pollen-analysis to be of Late Boreal age, has caused the site to be regarded as the type-station of the Maglemosean flint industry of Britain. Clearly then, as earlier discoveries suggested, and more recent finds confirm, the working-floors at Broxbourne, which were brought to light in the circumstances described, demonstrate that during the time the Maglemosean culture flourished around the Ancylus Lake, from the Pre-Boreal to the Boreal climatic phase, some of its exponents had over the generations crossed from the Baltic region. All the way over the upraised North Sea bed, on the expanded maritime tracts, in the estuaries and lower reaches of undrained valleys, they moved and subsisted in a generally uniform environment of fens, marshes, meres and watercourses to which they were well accustomed.

Familiar with Mr. Warren's inquiries, that discerning and indefatigable observer the late J. G. Marsden, of Acton, devoted much time to studying conditions revealed by gravel-quarrying plant in the valley of the Colne. Before long he saw that the main succession of Holocene deposits exposed between Rickmansworth and West Drayton-Yiewsley was identical with that along the Lea where the Maglemosean industry had been found stratified. Abundant support for this opinion was provided by the confirmatory evidence of archaeology, since he discovered in geological conditions many and mostly brown-stained flint implements at several points where the flood-plain

gravel was commercially extracted. Typologically the artifacts matched exactly those assembled at Broxbourne. Moreover, Marsden recognised their parallels in the objects Messrs. A. S. Kennard, M. A. C. Hinton and F. N. Haward had found on the Buckinghamshire side of the Colne, almost opposite the Middlesex borough of Uxbridge.<sup>6</sup>

The utilitarian diggings constantly visited by Mr. Marsden included some near Harefield, Middlesex, and West Hyde, Herts.,<sup>7</sup> but that at Sandstone, Iver, Bucks., proved particularly rewarding and in time the site became remarkably informative. This last (at TQ(51)044836) lies between 100 and 103 ft. above O.D. just within Buckinghamshire, on the north side of the road A.4007 from Uxbridge to Slough, 200 yards west of Lambourne House and the Long Bridge, immediately beyond the lower end of Cherry Tree Lane. Here the dredging machines obliterated the cluster of cottages constituting Sandstone. Eventually their extending operations devastated the rustic background of moor and fen amidst a medley of waters that comprised a mere formed by the junction of the Alder Bourne with another tributary and lesser channels of the Colne (Pl. I (a)). A little way south of the road the streams, although much altered today, still combine with the large and important subsidiary Colne Brook.

#### ARCHÆOLOGICAL EXCAVATIONS

From the pebbly, sandy lower part of peat, or of compact peaty material that had lain immediately upon the flood-plain gravel, Marsden had extracted flint flakes, blades, cores, core-trimmings and a few microliths that pointed to the possibilities of Sandstone as a Mesolithic site akin to Warren's in Rikof's pit at Broxbourne, Herts. (Fig. 2). Made in much the same conditions as upstream around Harefield, such discoveries at Sandstone ceased when the contractors gave up their exploitation. Shortly before, however, Mr. Marsden, helped by his daughter Miss Lily Marsden, his sons Thomas and Mostyn, and occasionally by the author, undertook systematic exploration by digging several trenches in the untouched area to the south-west of the original engine-house. Aiming at establishing the connexion of artifacts and deposits at Sandstone, Marsden came here regularly almost to the time of his death in 1938. Investigations were continued by Mr. Mostyn Marsden until he was called abroad. Anticipating this, he handed over all that had been found to the writer, who pursued inquiries as opportunity served. Unfortunately, these did not last long, for the then London Passenger Transport Board used the site as a tip for spoil removed from the railway cutting into the new station at Uxbridge. Thus the ground was heavily covered with London Clay, cumbering the pond that had been created during the period of gravel-extraction and causing deviations in the courses of the small streams. Yet the employees of the Board spared a few patches, a piece of seeming good fortune that was nullified when the outbreak of war soon afterwards brought archæological inquiries at Sandstone to a close. Markers, however, were placed where openings had been made and at spots hopefully selected for future digging. Yet, if in the event this were to prove impossible, the compiling of a report on what had been accomplished would not be difficult. For samples had been taken of

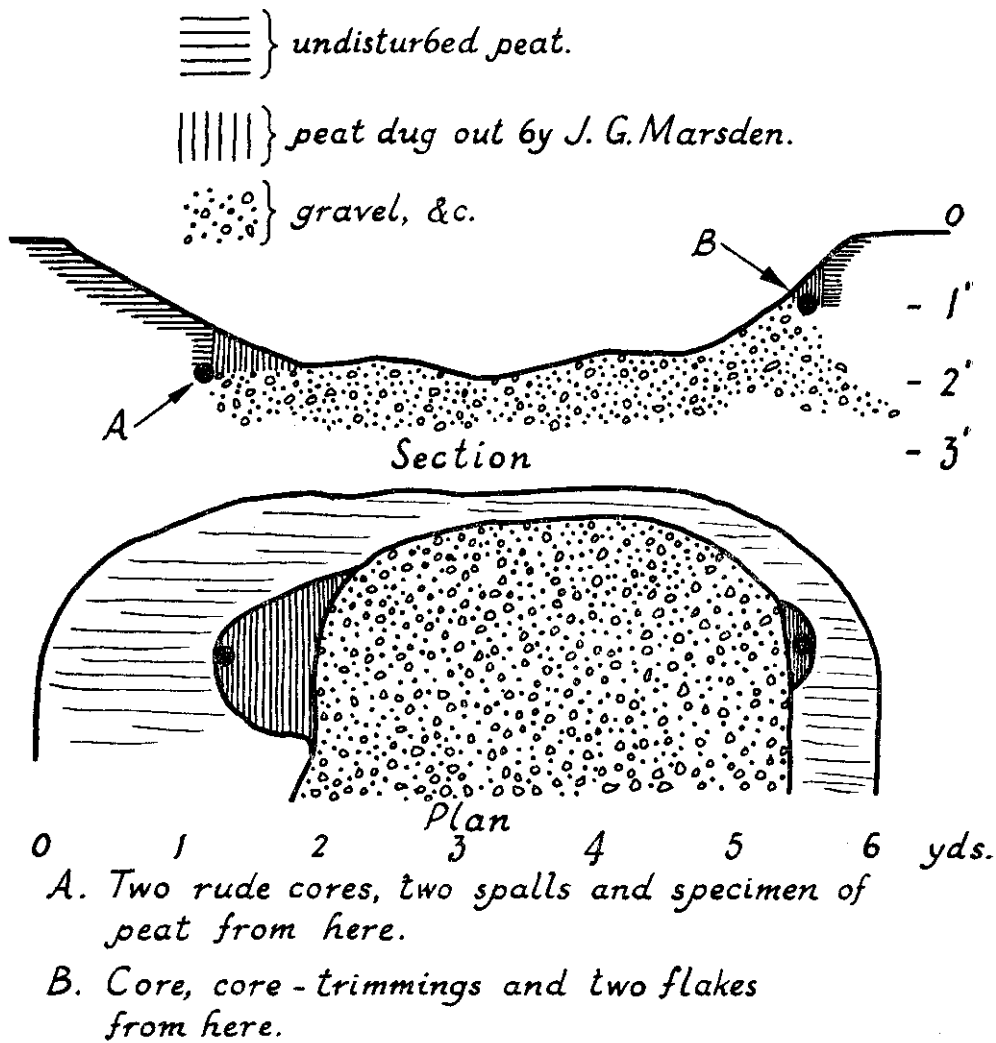


FIG. 2. Conditions at Sandstone pit on 3rd September 1935. From a field-drawing by J. G. Marsden.



all the deposits for pollen-analysis and other tests; besides, the artifacts found at Sandstone had been classified.

The presence of flint artifacts in the stony lower part of the compressed peaty bed scooped up by the mechanical grabs showed where and how the relics of prehistoric industries might be expected in an archæological excavation. Indeed, this was abundantly confirmed by the subsequent diggings, for the relics figured here from Sandstone occurred among pebbles at the very bottom of the compact layer, from sand upon the peat-burdened gravel, or from where they lay directly upon the gravel. Flints of identical facies and brown-staining were also found near the bottom of loose peaty soil that was frequently encountered instead of the compact material. Again the systematic exploration yielded similar artifacts lying upon gravel, or in sand upon the gravel, under shelly calcareous mud locally overlaid with quite friable peaty soil. Finally, a few resemblant flints were also taken from loose peaty soil near grass-level where the vegetable capping was thin. The flood-plain gravel did not always occur at the same depth from grass-level. In some places its surface was flush with that of the water at from 3 to 6 ft. (0m.91 to 1m.82) down. In others water was not reached. Sometimes, however, when this happened, water seeped slowly into the archæologists' trenches. The cuts and bores of the contractors have also shown this irregularity, thereby demonstrating how undulating was the ancient surface of the gravel. This indicates that the flint-knapping bands sojourned on ridges, banks or perhaps small islands, needless to say, only when these formations stood well above the water. Later occupation is, of course, suggested by the artifacts found in the peaty soil accumulated on top of the gravel. However, since so many of these precisely match those from the lowest deposit, it may well be that floods broke down old containing beds, strewing their contents on top of actually less ancient layers.

#### LATEST INQUIRIES

Circumstances prevented the author from seriously resuming inquiries at Sandstone until 1955. By then an archæological survey of wide scope was in train. Embracing the tributary valleys around London, it took in the alluvial beds including those of the Colne. Considering the advances made in the field of Mesolithic studies where comparable deposits were involved, the investigations had of course to be concerned also with the place of the industries represented in the Holocene sediments in the borderlands of the three counties.<sup>8</sup> Hence it became imperative to concentrate on the Sandstone site with the special aim of determining the connexion of the implementiferous beds here and north of Uxbridge.

Great changes indeed had taken place at Sandstone. Since the war there had arisen a huge sub-station of the then Central Electricity Authority (Pl. I (b)). What remained of the mere had been entirely filled, and the Alder Bourne within the area of the undertaking now coursed between straight artificial banks. Nevertheless, exceptional opportunities to check former, and to make new observations presented themselves.

By a fortunate coincidence, deep, square holes had been dug for the foundations of some plant next to a place marked so long before where the most

interesting archæological excavations had been. Thanks to Mr. P. R. S. Russell, the engineer in charge, who kept pumps going to stem a rapid inflow of water, the writer was able to descend into an opening to take notes and remove a fresh series of samples from the different strata exposed in the clean vertical walls.<sup>9</sup> Just over 7 ft. 6 in. (2m.28) high, these showed that their upper part constituting about half of the whole section, consisted of a make-up of spoil 2 ft. 6 in. (0m.76) thick from the London Transport railway cutting.

The examination here proved of great value because: (a) it revealed a simple sequence of deposits embodying and confirming what had in the main been so often observed; (b) some flint artifacts were grubbed out of the basal sandy gravel at water-level; and (c) the black compressed peaty mass, its lower part sticking to the basal sandy gravel, gave an interesting pollen-count, as is shown below.

Eleven samples from the layers between the basal gravel, on which, or in the sand on top of which, the flint implements occurred, were sent to Mr. G. F. Mitchell, Department of Irish Archæology, Trinity College, Dublin, to whom and Miss H. M. Parkes very grateful thanks are given for counting the pollen-grains detected in five crucial specimens. To the palæobotanical table so obligingly drawn by these scientists,<sup>10</sup> and reproduced here, are added the depths at which the samples were removed. Below is also given a description of the beds extending that set out within the framework figured on p. 154. Read in normal geological order from the bottom upward (Pl. II), the succession is as follows:

- E Clayey soil made up (spoil from London Transport excavations).
- D Peaty clay (including in upper part buried top soil, heath and grass).
- C Open-water mud with shells (calcareous and grey).
- B Peat (compressed, clayey and decayed; containing pieces of trees mainly birch, hazel and pine, also a tine of a very large red deer).
- A Gravel (with sand and flint artifacts on top).

On the specimens sent to him for pollen-analysis Mr. Mitchell has pointed out that his comments, which follow, are best studied in conjunction with the above section and Table I.

“The basal gravel was not represented in what you sent us.

“In the peat pollen was very badly preserved, and we confined our attention to Samples 2 [from B at 2m.13, 7 ft., down] and 4 [from B at 1m.67, 5 ft. 6 in., down]. Only 100 arboreal pollen (including *Corylus*) were counted in each sample. Pine pollen (and fragments of such grains) was common. We did not see any pollen of *Alnus*. The lower sample had a high content of sedge pollen. The samples had high content of fragments of deciduous wood, and I feel sure that *Pinus* has been exaggerated by differential destruction of other pollens. No aquatic algæ were noted, and the peat may have formed in a sedgy swamp, such as would form under conditions of rising water-table.

“What you call ‘light grey clayey material with some fine gravel and sand [lower part C]’ is really a sandy calcareous mud with mollusc shells (both lamellibranchs and gastropods). The mud had been slightly disturbed by roots and worms (?). I picked a few of the shells out of Sample 6 [from C at 1m.44, 4 ft. 9 in., down] and have enclosed them in a glass tube. This is certainly an

open-water deposit, probably formed in a pond or lake formed by continued rise of water-table. Pollen was not abundant, but 100 pollen were counted in Sample 8 [from C at 1m.22, 4 ft., down]. You will note that only two of the grains were *Alnus*.

“Your ‘light grey clay with some peat [author’s description of part of D]’ was rather enigmatic. It seemed to have some vegetable content, but we could not see any pollen in it.

“We did not examine the ‘clayey soil made up’.

“In our opinion, all the pollen-containing deposits are Boreal in age, probably ‘late Boreal’ rather than ‘final Boreal’. If Sample 8 was final Boreal, we would expect higher values for *Alnus*, and some record of (lime) *Tilia*. If the small numbers of pollen counted are not lost sight of, Sample 8 may perhaps be compared with the Sample 12 in the Broxbourne diagram (Fig. 11).<sup>11</sup> Your material should be comparable in age with the Broxbourne artifacts. Your site must have disappeared below open water before the Boreal period came to an end.

“I make no comment on the other counts of your samples, beyond saying that in the peat pollen was in very poor condition, that in Sample 2 we could not identify *Alnus* pollen, and that in Sample 4 we saw only small amounts of (elm) *Ulmus*.

“I think it would be well worth your while to have the molluscs in the chalk-mud (i.e., your ‘light grey clayey material with some fine gravel and sand’) identified and commented on by an expert.”

Besides pointing to the Late Boreal age of the polliniferous heavy, black peaty matter, the preceding paragraphs by Mr. Mitchell tend to confirm the opinion already held that the floor was drowned not so very long after it had been occupied by the Mesolithic squatters. The writer thinks that an indication of this flooding is the presence of gravel elements and occasional flint artifacts in the base of this compact peaty bed (B) immediately above the flood-plain gravel (A). Apparently rapid, this regional inundation of the Late Boreal climatic phase which is denoted here by the dense material upon the gravel, and which overwhelmed several Mesolithic floors in the valleys of the Colne, Lea and Kennet, was a concomitant part of the great and widespread submergence abundantly evidenced in south-eastern and eastern England and in the Baltic area.<sup>12</sup>

Having followed Mr. Mitchell’s advice, the author sent relevant samples to the British Museum (Natural History). From this institution Mr. A. G. Davis kindly reported on the shell-bearing mud and its contained animal remains. The faunal list, however, is meagre compared with that referred to from the site at 100-Acres. Yet one must welcome the interesting suggestions on some subsequent developments at Sandstone in this formerly fenny area.

“29.11.1956

“The shells are dwarfed and not plentiful.

“The deposit shows much debris from the land in the form of twigs and sticks coated with tufa. The deposit probably belongs to a backwater liable to drying up, and choked at times. The water also contained much calcium.

“Age: very little to go upon. I think earlier than the fauna recorded by

TABLE I—IVER [Sandstone (Electric Sub-Station)]: 19.XI.1955

DEPTH			DEPOSIT	POLLEN																				
Metres	Feet	Inches		Sample No.	<i>Alnus</i>	<i>Betula</i>	<i>Corylus</i>	<i>Ilex</i>	<i>Pinus</i>	<i>Quercus</i>	<i>Salix</i>	<i>Tilia</i>	<i>Ulmus</i>	Total AP	Total NAP	<i>Artemisia</i>	<i>Compositae?</i>	<i>Cyperaceae</i>	<i>Ericaceae</i>	<i>Galium</i>	<i>Gramineae</i>	<i>Ranunculus?</i>	<i>Sparganium?</i>	<i>Umbelliferae?</i>
0.76	2-6		11	Clayey soil made up (E)	Not examined																			
0.86	2-10		10	Peaty clay (D)	No pollen seen																			
1.1	3-7		9	Open-water mud with shells (C)	-	-	10	-	-	-	-	-	-	10/3	-	-	-	-	-	2	-	-	-	1
1.22	4-0		8		2	3	61	1	8	18	-	-	7	100/45	1	3	5	-	-	31	-	-	-	5
1.32	4-4		7		Not examined																			
1.44	4-9		6		-	-	17	1	1	2	-	-	3	24/29	-	-	13	-	1	8	1	-	1	5
1.52	5-0		5		Not examined																			
1.67	5-6		4	Peat (B)	-	-	24	-	73	-	-	-	3	100/12	1	3	2	1	-	-	-	1	-	5
1.82	6-0		3		Not examined																			
2.13	7-0		2		-	1	11	-	70	-	9	-	-	100/126	-	-	113	-	-	4	-	-	-	9
2.28	7-6		1		Not examined																			
					Gravel (A)																			

[J.] Howe. [*Proc. Geol. Assoc.*, xviii, 1903-4, pp. 189-90, reference No. 6, *infra*, p. 180]. On p. 190 [*ibid.*] a travertine is recorded near the viaduct over the Misbourne. Your Samples 6 and 7 belong to this travertine. . . .”

TABLE II

	Samples		
	6	7	8
<i>Valvata cristata</i> (Müller)	5	5	—
<i>Valvata piscinalis</i> (Müller)	9	5	—
<i>Bithynia tentaculata</i> (Linné)	4	7	—
<i>Bithynia leachi</i> (Sheppard)	—	1	—
<i>Lymnaea peregra</i> (Müller)	6	7	4
<i>Planorbis albus</i> (Müller)	1	—	—
<i>Planorbis contortus</i> (Linné)	1	1	—
<i>Ancylus fluviatilis</i> (Müller)	1	—	—
<i>Limax</i> sp.	1	1	—
<i>Pisidium casertanum</i> (Poli)	—	1	—
<i>Pisidium</i> sp.	2	—	2
Incisor of Vole (indeterminate)	—	1	—

No. 6, at 4 ft. 9 in. (1m.44) down;  
 No. 7, at 4 ft. 4 in. (1m.32) down;  
 No. 8, at 4 ft. (1m.22) down.

#### THE INDUSTRY

*Typology.* Since pollen-analysis shows that the peaty beds denoting the drowning of the occupation-sites and sealing the artifacts at Sandstone, Iver, and at Rikof's pit, Broxbourne, can reasonably be correlated, it may be accepted that the representative series figured from our site in Buckinghamshire are also assignable to the same aspect of the Maglemosean culture in this country as Warren's finds in Hertfordshire. Further, the mode of occurrence of both industries indicates that in point of age there can be little or no disparity between the two. Certainly the constituents of the assemblages from Sandstone and Broxbourne are so similar in facies that they could have been turned out by the same craftsmen. The brown-staining of many specimens, the quality of the flint from the Chalk that went to their making and the dimensions of the artifacts themselves enhance the likeness. Because the worked flints found at Sandstone under the Late Boreal peat are of early Mesolithic fashioning, they are important additions to the small list of comparable relics found stratified in connexion with early post-glacial deposits in low-lying parts of the Thames drainage. Though resembling the products of the main industry, which occurs at Sandstone on what are considered to be the remnants of a

sandy land-surface on top of the flood-plain gravel, the rare artifacts recovered from loose material, generally at no great depth, are discounted here.

Restricting our examination to the principal series from Sandstone, we see that they rank first with Warren's classic collection from Broxbourne. They apparently correspond also to a small lot which, discovered long ago in the alluvium of the now buried and forgotten Hackney Brook, was lately recognised to be of the same Mesolithic facies.<sup>13</sup> Outside the Lea basin, not far from the overbuilt Ty Bourne, still another left-bank tributary of the Thames, the once problematic artifacts from the upper beds resting upon the flood-plain gravel, and exposed about 70 years ago, near the Admiralty at Westminster<sup>14</sup> can be ranged on stratigraphical grounds with the clutches of Mesolithic objects from Sandstone. Coming to the valley of the Colne, we perceive the geological and typological analogies between the flint implements of Sandstone and those found by the late J. G. Marsden and the author near West Hyde, Herts., and Harefield, Middx.<sup>15</sup> Very similar associations are indicated by the other prolific Colne-side flint industry we shall see later from Denham parish. Meanwhile, it has to be said that for links as positive as encountered at Broxbourne one turns to the yield of Mr. John Wymer's recent brilliant excavations in the Holocene beds on the left bank of the River Kennet at Thatcham, near Newbury, Berks.,<sup>16</sup> just over 12 miles above its confluence with the Thames.

*The Artifacts.* (A) Essentially the industry represented by the relics from the top of the gravel at Sandstone was one of riving flint for flakes and blades. Taking together the plain, utilised and trimmed examples and the cores from which they were detached, one sees that sizes range from about 8.5 cm. to 2 cm., the most numerous products in the assemblage being of the order of 5 cm. to 7.5 cm. This means that the average is a little below that of the flake industry of Broxbourne.

Flakes and blades in prehistoric groups of flints show general resemblance from Upper Palæolithic to Bronze Age, but the objects dealt with here are as a collection more delicate and graceful than most met with in Neolithic and later series. Quite Upper Palæolithic of aspect, they testify to an ancestry lying in well-developed industries such as were scattered over the continent of Europe before the ice of the last and threefold glaciation had receded very far. Besides these, there are items from Sandstone typical of forms devised in Baltic and other lands to meet the needs of an environment differing in certain ways from that of late Upper Palæolithic times.

Fig. 3 shows drawings of flakes and blades edge-worn from use as scrapers and knives. With some plain and unusual but significant examples, these demonstrate the general run of the basic material without our having recourse to a set of illustrations devoted entirely to featureless artifacts merely to show their dimensions. Further, the specimens figured as representing the industry of Sandstone proclaim that the foundation of its output consisted of somewhat smaller material than that which served on the Mesolithic floors at Broxbourne.

Not trimmed, but much worn along its uppermost edge, no. 1 of Fig. 3 is simply a tool improvised in one of the first pieces struck from one of these

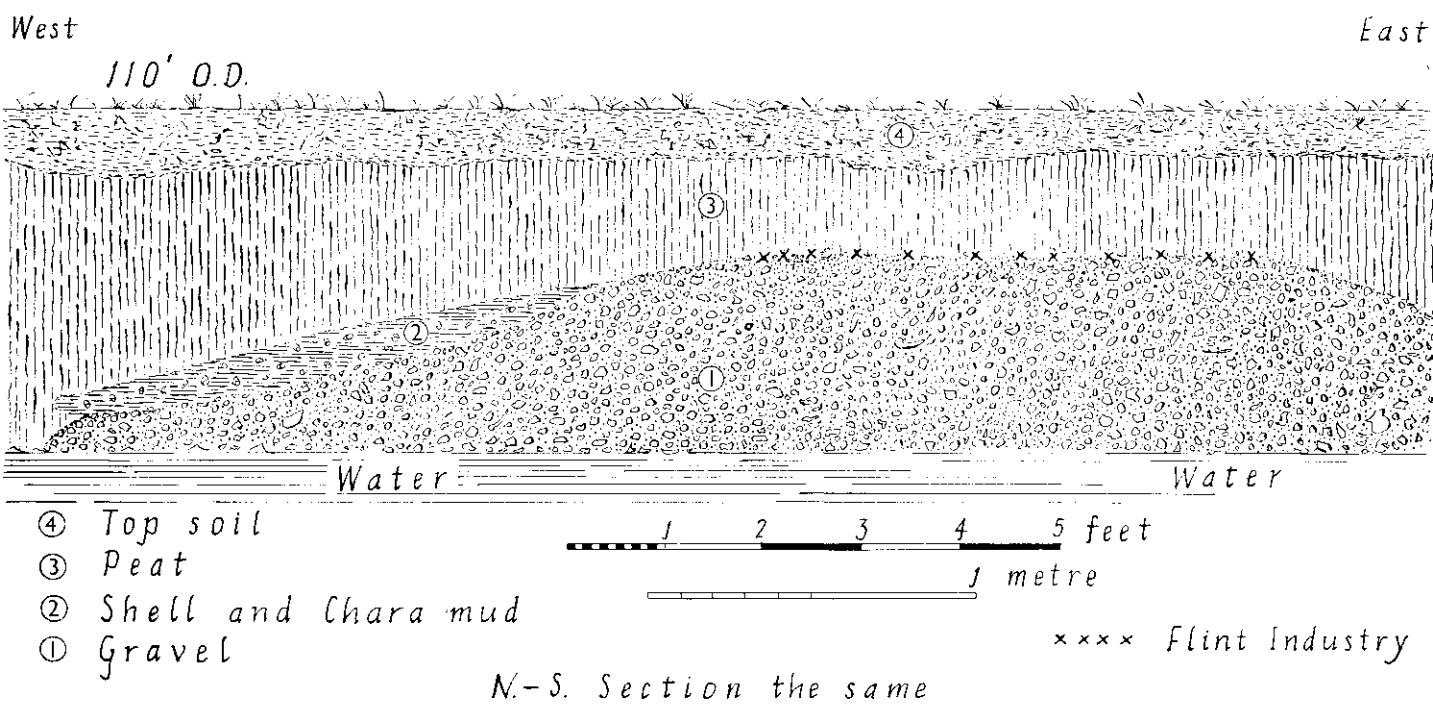


FIG. 8. Section in Boyer's pit, 100-Acres, Denham, about 1918. Based on an annotated sketch by F. N. Haward.

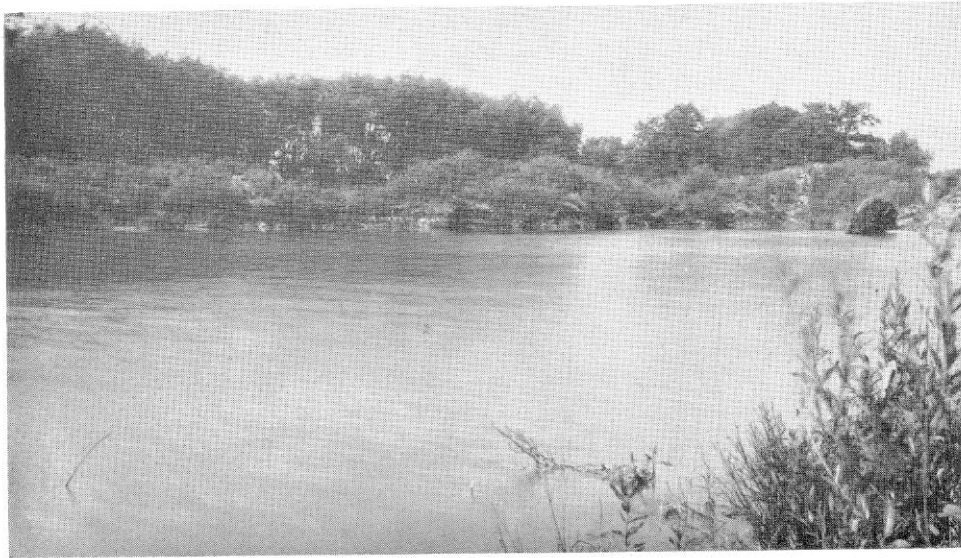


PLATE I (a). Lakeside scene near Mesolithic site at Sandstone pit, Iver, in 1936.

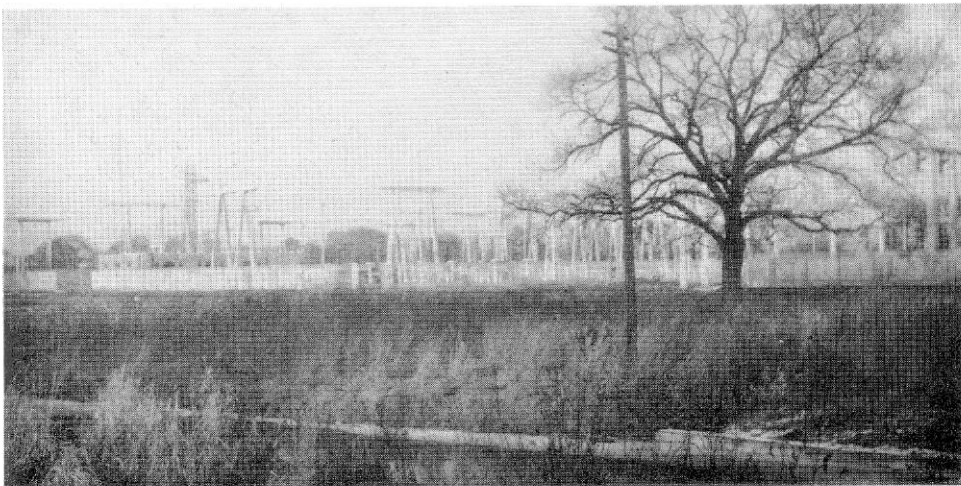


PLATE I (b). Looking across the Mesolithic site in 1955.





PLATE II. Section at Sandstone (Electric Sub-station), Iver, on 13th November 1955.  
 Deposits (see pp. 151-5):  
 E—Clayey soil made up;  
 D—Peaty clay;  
 C—Open-water mud with shells;  
 B—Peat, lower part in water; having below it  
 A—Gravel, with sand and artifacts on top.



PLATE III (a). Remains of Boyer's pit in the 100-Acres and site of Mesolithic industry, near Willowbank, Denham.



PLATE III (b). Looking westward over the alluvial plain of the Colne in Buckinghamshire, from railway embankment in Middlesex. The fence here marks the boundary between the counties. An arrow indicates the site of the Mesolithic finds in Boyer's pit.

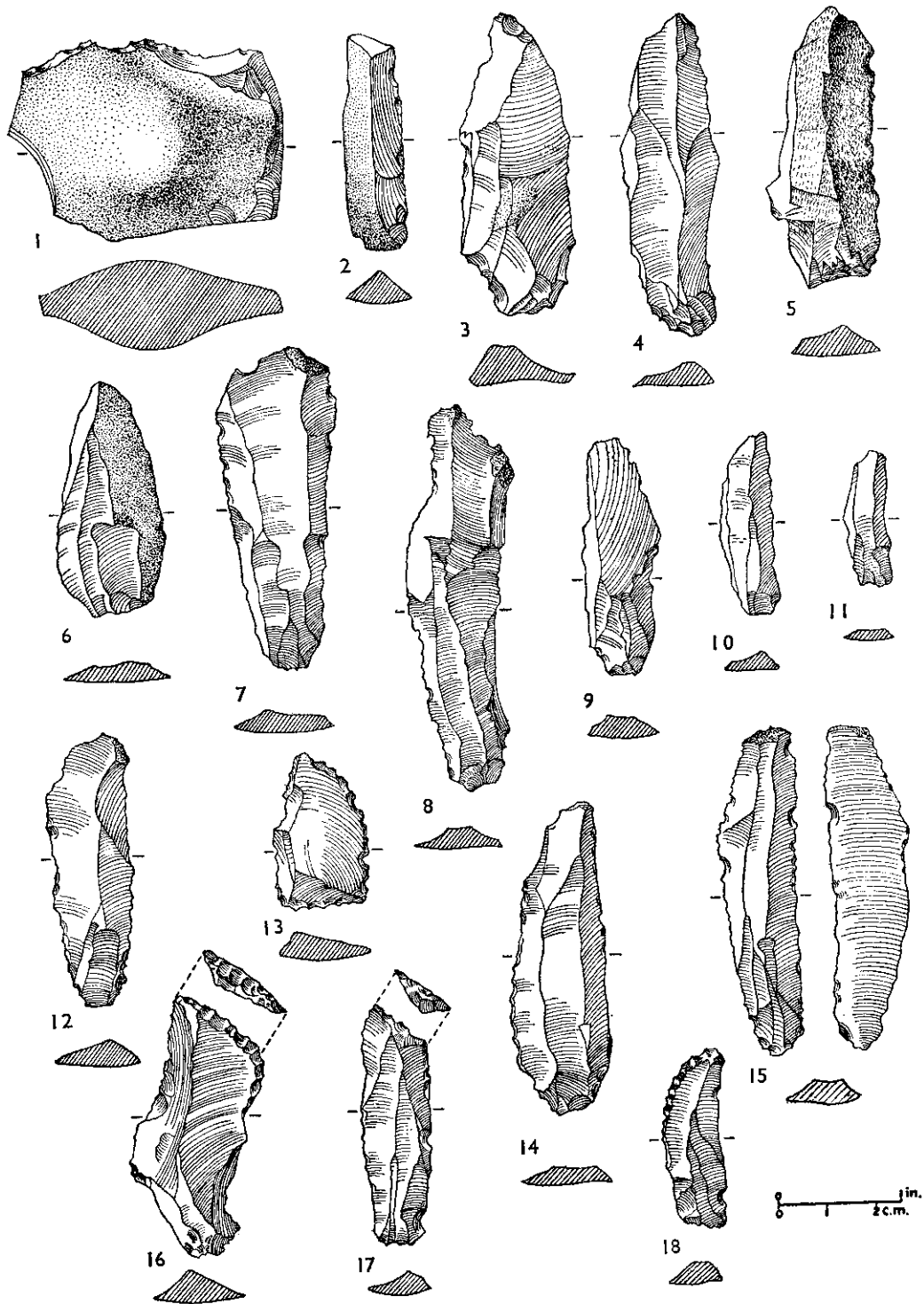


FIG. 3. Sandstone, Iver: flakes and blades, utilised 1-3, 5 (heat-crackled), unscathed 6-11, retouched 12-13, 16-18. All of flint.

knobbed nodules of flint that are so frequently observed in this locality among the lumps from the Chalk. Contrasting with this, no. 2, a narrow and triangular flake, retains much of the original crust of the nodule. This shows with the scarred opposite flank that the specimen was detached from the parent after minimal treatment. Of nos. 3, 4, 6–11, 14–15 which are simple blades, nos. 3, 4, 7, 8, 14 and 15 exhibit some signs of wear, while nos. 6, 9, 10 and 11 are unscathed. Much interest attaches to the badly heat-crackled no. 5. Its condition is no doubt due to a camp-fire which also affected some other flints at this site, though none so much as this.

No. 12 bears some feeble trimming along the right-hand margin near the butt, while the edge opposite for its whole length seems nibbled by use. Though basically a poor flake, no. 13 has been transformed into a sort of compound scraper by dressing the whole of its convex long edge and its straight lower end. A narrow and simpler version appears in the blade-implement no. 18. End-scrapers on blades nos. 16 and 17 are typical. These instruments are noteworthy by reason of their oblique working-ends.

(B) The flint-workers at the Sandstone site produced a remarkable array of scrapers besides those executed at the end of blades. These illustrated in Fig. 4 are a selection from quite an impressive group that helps further to demonstrate the variety of scrapers used by the early Mesolithic bands in this country. Four short implements, nos. 1–4, can be matched precisely in any comprehensive Maglemosean industry. Here it suffices to cite comparable specimens figured from Broxbourne. Our nos. 1 and 2 are of the so-called thumb-nail sort, and nos. 3 and 4 technically side-scrapers. In common with so many other early Mesolithic scrapers made in England in the Maglemosean tradition, nos. 1, 2 and 3 retain much of the external cortex. So do also nos. 5 and 6, respectively an end-scraper terminating in a point with some lateral trimming, and a heavy, steep and long multiple-purpose scraper. Working along the edges of these six tools is of a high order.

(C) The presence of graters in the series from Sandstone is not unexpected considering the facies, the origins of the industry and the mode of its occurrence. Naturally, such tools suggest that bone- and/or wood-working were practised, though no piece of either of these substances bearing any signs of cutting has been found here. In this regard it is recalled that, rich as it proved, the Broxbourne sites yielded graters but no worked bone, and of the other sites where Mesolithic relics have been found stratified in the basin of the Thames and its tributaries around and above London, only that at Thatcham, Berks., has yielded bone artifacts in association with the output of a flint industry that included graters too. One has to go to Yorkshire, certainly at Star Carr,<sup>17</sup> and possibly at Skipsea and Holderness,<sup>18</sup> for an early Mesolithic site productive of stone and bone industries in conjunction. However, only two examples of graters need be figured from Sandstone. One, no. 7, is of the single-faceted kind made on a flake, while its companion, no. 8, has been achieved by fine triple faceting an end of a thick core-like piece of flint. In this a wider single facet opposite the lower end, as shown here, provides a chisel-like cutting-edge, so enriching the clutch of artifacts from Sandstone with a sort of two-ended grater.

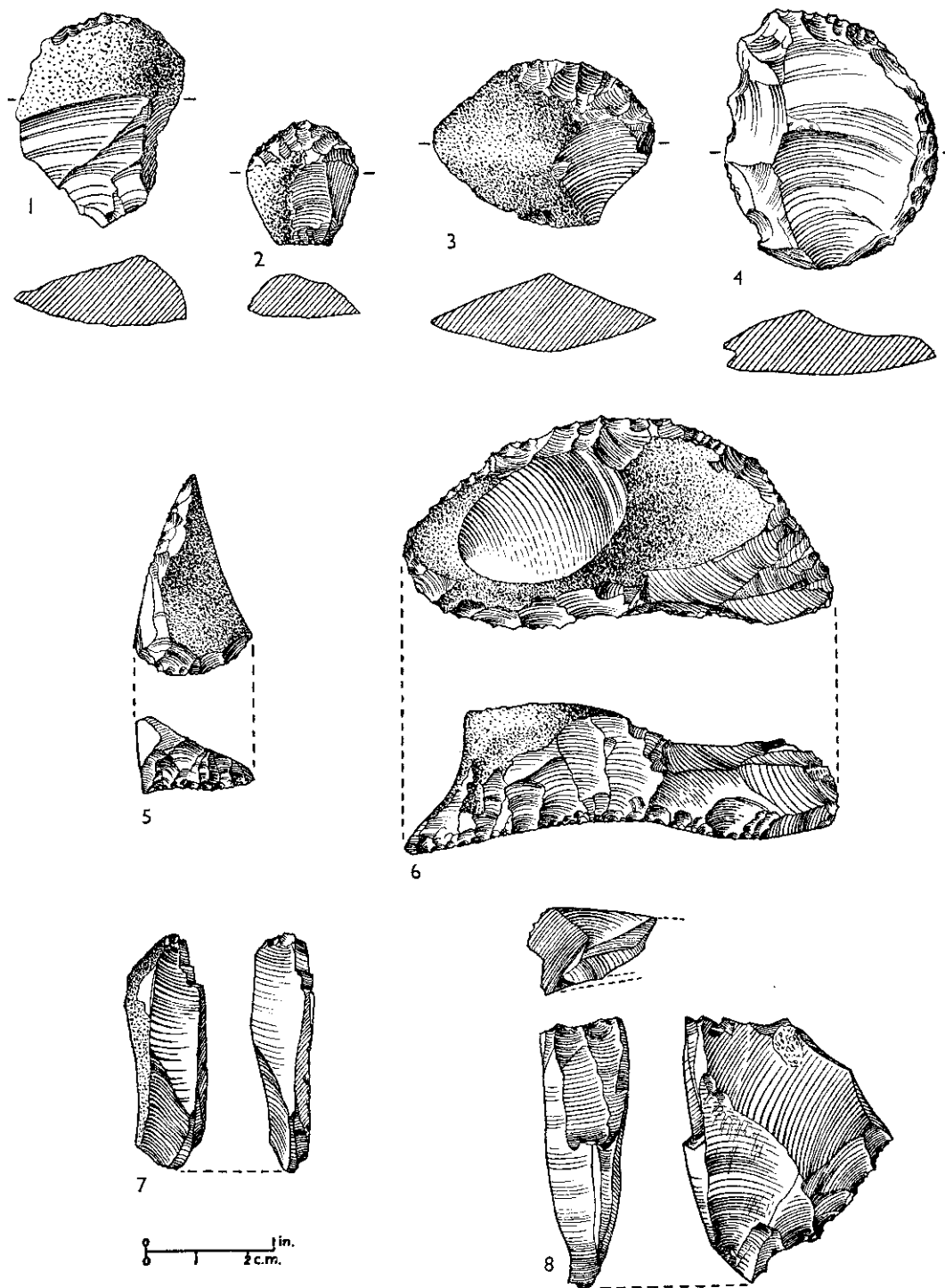


FIG. 4. Sandstone, Iver: 1-6, scrapers; 7-8, graters. All of flint.

(D) Among so many other relics, microliths in fair numbers have rewarded the researches of years at Sandstone. None, however, is really diminutive or of geometric shape such as characterises the fascinating, minute and amazingly delicate products of the later Mesolithic industries so long described as Tardenoisian. This fact strengthens the kinship with the Broxbourne industry and its microlithic element. Much of this aspect in the Buckinghamshire assemblage consists of broken specimens, the small size and fineness of the actual implements making them particularly liable to injury. Obliquely pointed fine blades are the commonest forms, as Fig. 5, no. 1, with its worked end shown lower according to the conchoidal ripples, and nos. 4 and 5, of which two no. 4 is steeply blunted on the right and no. 5 on the left. Slightly defective, nos. 2 and 3 are simple, narrow blades obliquely trimmed across the lower end. When complete, no. 13, though narrower, probably ranked with these last two (nos. 2 and 3). No. 6, a very narrow and thin blade-implement, exhibits steep dressing in two places on its right-hand margin. Larger examples of this kind are represented by nos. 9 and 11, the first more elaborately dressed for most of the length of its right-hand margin, and the second for two-thirds of the left-hand one.

Mounted at the end of a shaft, some of these artifacts could have served as arrow-heads, for instance no. 6, and perhaps such delicately and abruptly trimmed instruments as nos. 7 and 8, also no. 10 (its bulbar end shown upper), as well as no. 12 and the now fragmentary no. 15. Alternatively, these nos. 8, 10, 12 and 15 could, as armatures of a piece of fishing-gear, have been firmly fixed into grooves along the sides of wooden or bone heads, such as have been found at Maglemosean sites in Denmark and southern Sweden.<sup>19</sup> Had no. 14 not lost its upper part it would have been a pleasing narrow pointed blade. Its finely worked tang suggests that it was probably meant to be inserted into some kind of holder.

Scrutiny of the delicately made microlithic forms reveals that the specialised technique of manufacture by preparative notching and division of the parent blade accounts for many of these interesting objects from Sandstone. Confirmatory evidence of the practice is provided by typical waste in the form of micro-burins. Here is illustrated in no. 16 a characteristic butt-end specimen with its unwanted thick bulb of percussion. This residue exhibits vestiges of the oblique scar resulting on the main separation surface from the blow dealt inside the prepared hollow to divide the blade. Accompanying this perfect example is the drawing of the bulbar fragment of a blade which accidentally fractured across in the course of being worked. When one considers the fineness of blades that went to the making of microliths by the notching or micro-burin technique, it is not surprising to find that miss-hits and other fragments that testify to various hazards of fracture are common enough at sites where microliths were produced.<sup>20</sup> Such objects, and micro-burins also, have in the past too often been disregarded by collectors who have seen in them only worthless chips. What has been learned of recent years from such waste serves to emphasise that every piece, be it ever so small or apparently insignificant, ought to be taken for closer examination indoors than is usually possible in the field.

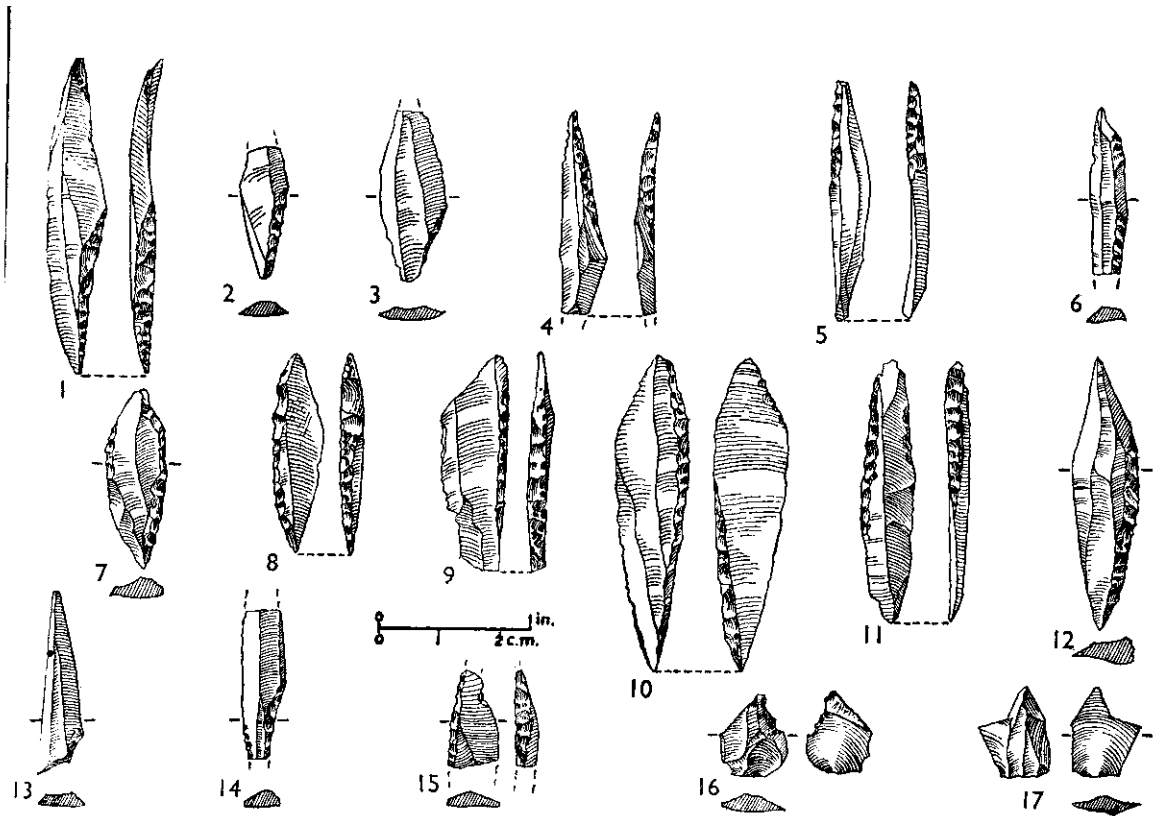


FIG. 5. Sandstone, Iver: 1-15, microliths; 16, micro-burin; 17, miss-hit. All of flint.

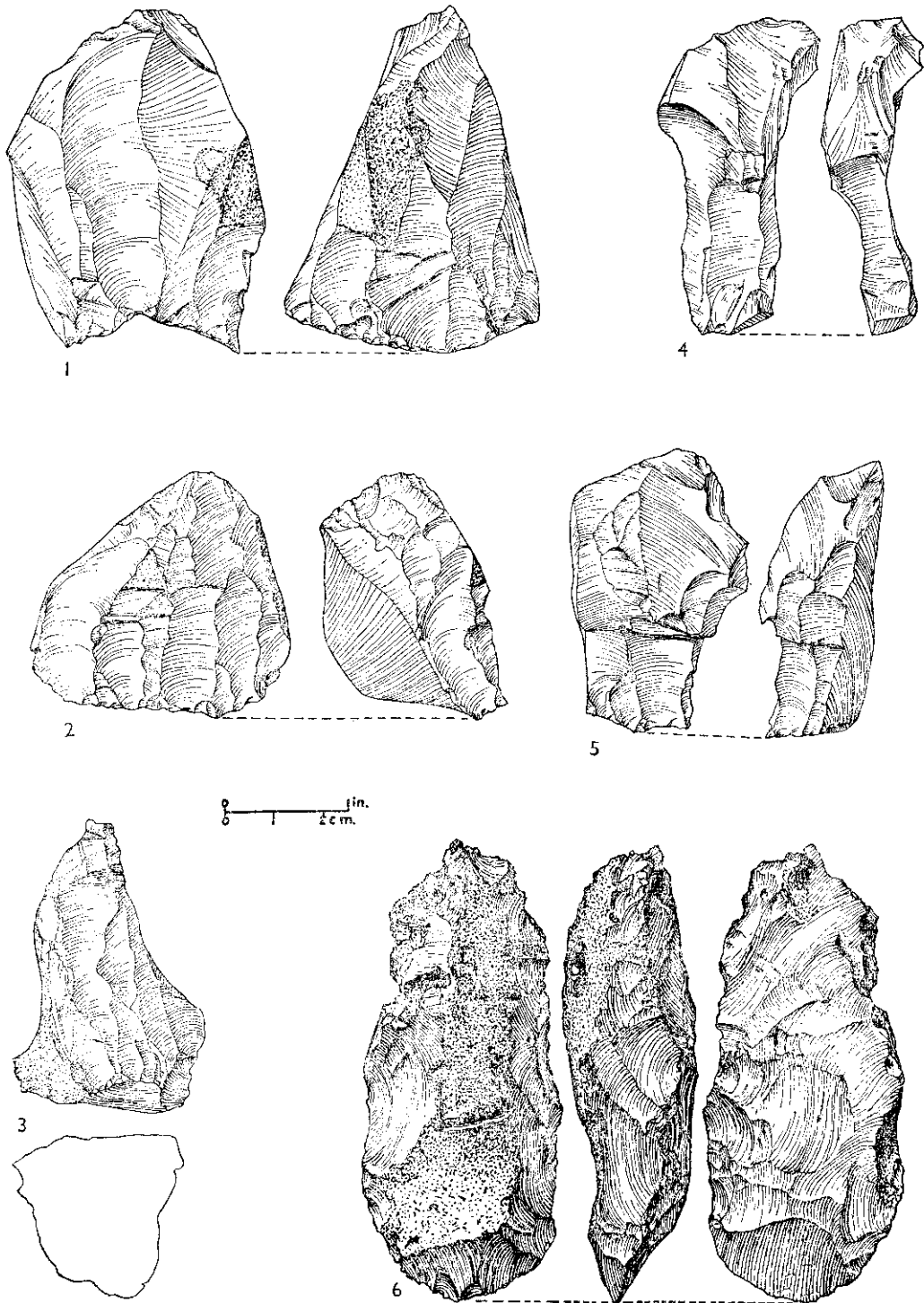


FIG. 6. Sandstone, Iver: 1-3, cores; 4-5, core-trimmings, 5, *tranchet* axe. All of flint.



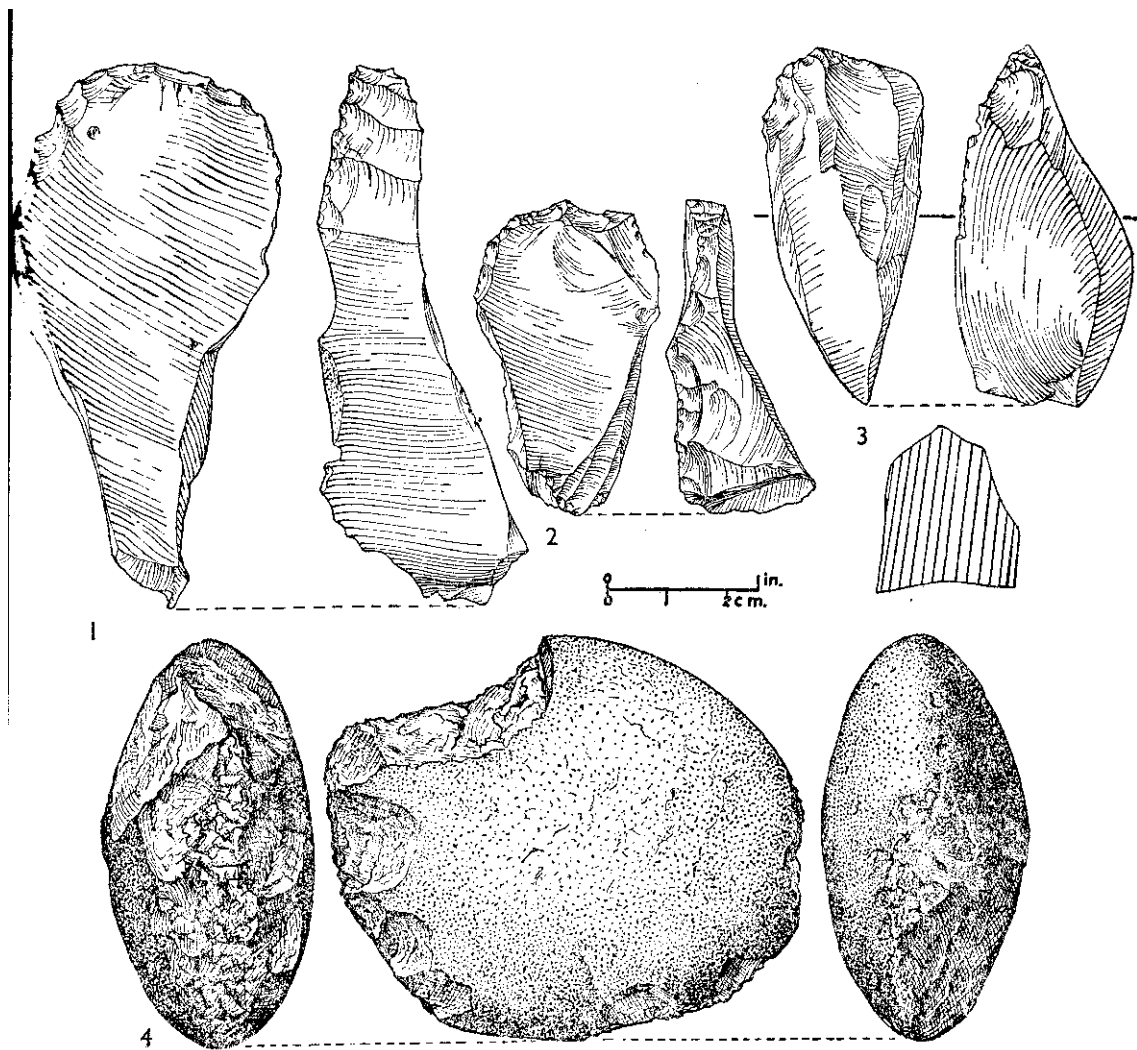


FIG. 7. Sandstone, Iver: 1-3, scrapers made on core-trimmings, all of flint; 4, hammer-stone of quartzite.

(E) Cores are well represented numerically in the collection from the sand on top of the flood-plain gravel at Sandstone. As the residue of material from which blades were extracted, they show little variation from the common pyramidal shape. Their scars proclaim the nature of the pieces detached from them in the ranges of plain, utilised and trimmed artifacts and microlithic forms illustrated in Figs. 3, 4 and 5. The cores figured now, Fig. 6, nos. 1-3, reflect the good quality of the flint and able workmanship, since only in a few, e.g., no. 1, do there occur small marginal pittings to suggest that several efforts were made to strike off flakes or blades. At first glance such pieces as nos. 4 and 5 might be taken for thin cores, but actually they are dressings or trimmings removed from already much worked-down material so as to produce a fresh surface and new striking-platform. It seems needless to say that this way of rejuvenating a core prevailed widely in the flaking industries of the Mesolithic cultures, but it is well to remember that it is especially evident in the Maglemosean.

(F) The method of renewing cores, and of course reducing them in the process, by slicing off a worn undesired piece was practised in a modified manner in the preparation, sharpening or re-sharpening of *tranchets*, the characteristic chipped axes of Maglemosean industry.<sup>21</sup> This produced a typical waste flake from the blow applied transversely at an end of the thick flaked rod. Although no specimen of such a sharpening flake was detected during the course of the investigations at Sandstone, yet a particularly fine *tranchet* axe, no. 6, was found here. From this, such a sharpening flake was detached. The tool increases the interest of the series from this Buckinghamshire station and enhances its early Mesolithic aspect.

Although no sharpening flake from a *tranchet* axe has been certainly identified, yet utilised and edge-retouched core trimming flakes can be reported from Sandstone. Fig. 7, no. 1, of the trio illustrated shows signs of wear rather than of dressing or hammering along the edges within the truncated facets of the original core from which it was removed. In contrast to these indications of use, the nibbled retouches on the margins of the curious piece of flint no. 2 are like the dressing of ordinary scrapers. Similar but less obvious working appears round the rim of no. 3. This specimen is quite a large slice of the core that was probably a former source of blades for microliths.

A fortunate discovery at Sandstone consists of an oval pebble of Bunter quartzite, no. 4, which is profusely abraded and deeply scarred at both ends and along much of its periphery. Testifying by its injured surface to considerable use as a hammer-stone, it was an important accessory in the splitting of flint. This improvised tool was one of the first of Marsden's finds at Sandstone, where he extracted it with some flakes from sandy gravel adhering to the bottom of a stack of compressed peaty material brought up by the grabs. There can be no doubt that this mass in its lower part comprised some of the ancient land-surface upon which the early Mesolithic flint-knappers had sojourned. Although a relic of this kind is characterless, yet this example is interesting apart from its associations, for it is matched by three such hammer-stones from Warren's site at Broxbourne, one being illustrated in the report thereon.<sup>22</sup>

#### IV. 100-ACRES (BOYER'S PIT), DENHAM

##### HISTORICAL

Owing to its proximity to the town of Uxbridge, the important Mesolithic working-floor with which we are now concerned has from the early years of the century been credited to Middlesex by the literature of geology and pre-history. Today this site is no longer visible, but with the aid of its investigators' records and notes the spot has been located (TQ(51)054855) at 170 yards east of Willowbank bungalow estate and 50 yards south-by-west of a picturesque willow-girt pond. The hollow (Pl. III (a)) that this occupies is the vestige of the great gravel-workings of a member of the Boyer group of contractors. The actual prehistoric floor, however, lay under what is now the turf of the playing-fields attached to Sandersons Fabrics beautiful modern factory. All this property, known as 100-Acres, has long been given an Uxbridge address for postal and other purposes, which of course also partly accounts for the perpetuating of the inaccurate geographical ascription of a site that really belongs to Buckinghamshire. For this lies on the west or right bank of the Shire Ditch that separates this country from Middlesex on the opposite side (Pl. III (b)), and between this stream and the Grand Union Canal farther west. Beyond, again, the River Colne flows southward. Hence the place where the Mesolithic relics were found is in Denham parish, and as no representative groups have ever been illustrated in connexion with references to the site it is fitting that these antiquities be noticed in the *Records of Bucks*.

The archaeological discovery goes back to the summer of 1903. During a visit then of the Geologists' Association to Boyer's pit beside the Shire Ditch the late A. S. Kennard found here many sharp, brown-stained flint artifacts.<sup>23</sup> Following this, he kept the gravel-workings under observation until 1908, by which time he had amassed a few thousand specimens. In the light of current knowledge their mode of occurrence and appearance caused him and another distinguished naturalist, the late M. A. C. Hinton, to liken the objects to the products of continental Upper Palæolithic Magdalenian industry. Eventually Mr. F. N. Haward, of Ealing, bought all Kennard's specimens, adding many others to them during the ten years he continued to collect until Boyer's pit became derelict, presumably late in 1918, but not before he had assembled a very large hoard. Always ready to display this to inquirers and to discourse at great length upon its components, yet he never published any of the conclusions he drew from the circumstances of discovery, typology or workmanship. His principal deduction, which he imparted to the author, was that the flints had been riven and dressed by squatters on a gravel ridge or small island in a marshy setting. Not long before Haward's death the collection with his notes thereon was acquired by the British Museum, Bloomsbury, of which national institution the officers interested have not only most kindly allowed the writer to assess and describe the series, but have also very generously provided drawings.

##### THE SITE

Early standard works by Professor Clark on Mesolithic evidences in

Britain refer to the so-called Uxbridge site.<sup>24</sup> Necessarily brief, as befits the purpose of his summaries, his comments on the presence of the flint industry can now be expanded. The following is based therefore on the present writer's recollection of talks in the past with the principal investigators concerned and on the original finder's reports and Haward's annotated sketches. Since these last apparently constitute the only records of observation in the field extending over ten years and dominated by a search for and study of artifacts, no diagram to scale of a measured section can be shown. Instead, we have to be content with a simple drawing based on Mr. Haward's and on his notes, confirmed as well as possible by the author in the light of experience in the Colne valley.

Grass here grows today in the playing field at 110 ft. O.D. on made-up material that encounters water about 3 ft. down. Mr. Haward noted in his time that the top soil around Boyer's open pit was fairly uniformly thick, from 12 to 18 in., and that it rested on a compressed peaty bed varying from a few inches to several feet in thickness, which in turn overlay gravel. The top of this undulated from being flush with, or slightly above or below, water-level. While elsewhere in the district more than one peat bed has been noticed, here the only intervention observed by Kennard and Haward consisted of shell-marl and chara mud.<sup>25</sup> When completely bared it was sketched as impersistent and tailing off downward and towards the upper part of a wide ridge or islet rounded on top. (Fig. 8). Formed by the flood-plain gravel, it rose so well above the water-level to near the grass that its nature was evident. We can now pay tribute to Mr. Haward for having persuaded the contractors to spare this strip for the study that showed it to be the occupation-site and very active working-floor of food-gathering folk in a stage of Mesolithic culture encamped in the fens of the Colne valley.

Having the above facts of the site in the 100-Acres, one can now compare it with the two Mesolithic floors in the valley of the Lea at Broxbourne, Herts., found by the late S. Hazzledine Warren. Still held as typifying Maglemosean flint industry in Britain, their products occurred in sand on top of a buried bank of gravel immediately below peat determined by the analysis of its pollen content to be of Late Boreal age. The flints, unpatinated with many ochreous, which apparently began to be covered soon after use, must be regarded as struck only a little earlier during the Boreal climatic phase. That occupation had ceased by the end of this and beginning of the succeeding Atlantic we can also infer from pollen-statistics supported by geophysical and typological considerations.

The dating of Haward's collection from Denham parish by means of a pollen-count is now out of the question. Nevertheless, on the analogy of the discoveries in the Lea valley, it is reasonable to assign this Buckinghamshire industry also to a late part of the Boreal climatic phase. Such an ascription is upheld by the identity of the component specimens with the artifacts found by Warren at Broxbourne and with the precisely matching groups recorded by the present author in the Colne valley at Harefield, Middlesex,<sup>26</sup>  $1\frac{3}{4}$  mile north of 100-Acres, also now with the series found under Late Boreal peat at the Sandstone site farther downstream.

## THE INDUSTRY

*Typology.* Let it be said at the outset of this assessment of the flint industry from Boyer's pit that the products are of exactly the same Maglemosean facies as the clutches found above the flood-plain gravel at the Broxbourne type-site. Messrs. Hinton and Kennard therefore did not err on typological grounds when they said that the flint artifacts from the 100-Acres Boyer's pit resembled Upper Palæolithic cave Magdalenian. For the origins of the Baltic Maglemosean, from which these industries of the Lea and Colne valleys surely derive, lie mainly in the eastern European Upper Palæolithic equivalents of the better-known Magdalenian of the Ibero-Pyrenean region which they had in mind. They and Haward, without knowing that the artifacts were Mesolithic, certainly thought that these were earlier than true Neolithic.<sup>27</sup> The flint used by the craftsmen among the bogs of the Colne valley around what are now meadows and playing-fields is the same excellent quality from the Chalk about two miles to the north, and not the inferior sort composing most of the pebbles in the gravel. Fashioned in that good material and taken as a whole, the constituents of the collection are characteristic of a well-developed flaking industry. Like those in other groups found in comparable conditions in the valleys of the Lea and Colne, they testify to the mode of life of the manufacturers and users of the artifacts.

*The artifacts.* (A) Survival of the Upper Palæolithic tradition manifests itself most clearly in the fine flakes and blades that by far outnumber other artifacts in the collection. These vary in length from 8 to 2.5 cm. Most are in the range of 5 to 7 cm. While the series of smaller flakes and blades is not so well represented, it is interesting as being basic to a remarkable microlithic element. Long facets in all, Fig. 9, nos. 1-13, show that, although quite plain, the specimens were detached from well-pared cores. Marginal denticulations and very short scars evidence wear from use as knives, saws or scrapers, especially as in nos. 4, 6, 10 and 12. When worn out or discarded for any other reason, such implements could be replaced immediately by fresh, e.g., nos. 1-3 and 11. Many of the fine parallel-sided blades exhibit the signs of retouch or slight trimming along their edges, nos. 8, 9 and 13 being good examples, with the first (no. 8) considerably edge-worn.

Hereinafter, registration numbers applied by the British Museum to certain single specimens or to items grouped under one number are shown by request of the authorities. They appear in brackets.

(B) An imposing array of well-defined tool-forms mark an advance on the simple flakes and blades that have been retouched only along part of an edge. This, of course, accords with what one sees in any comprehensive output of a flaking-industry, more particularly in one where implements based on flakes and blades entered into so many aspects of food-collecting economy. Thus we find first a goodly set of scrapers, the commonest consisting of a parallel-sided blade dressed at the upper end. Nos. 1 (44) and 2 of Fig. 10 are typical. No. 2, however, also bears some marginal trimming along the left and the marks of considerable wear below this and for the whole length of the opposite edge. Fashioned on a rather wide flake that has the look of having

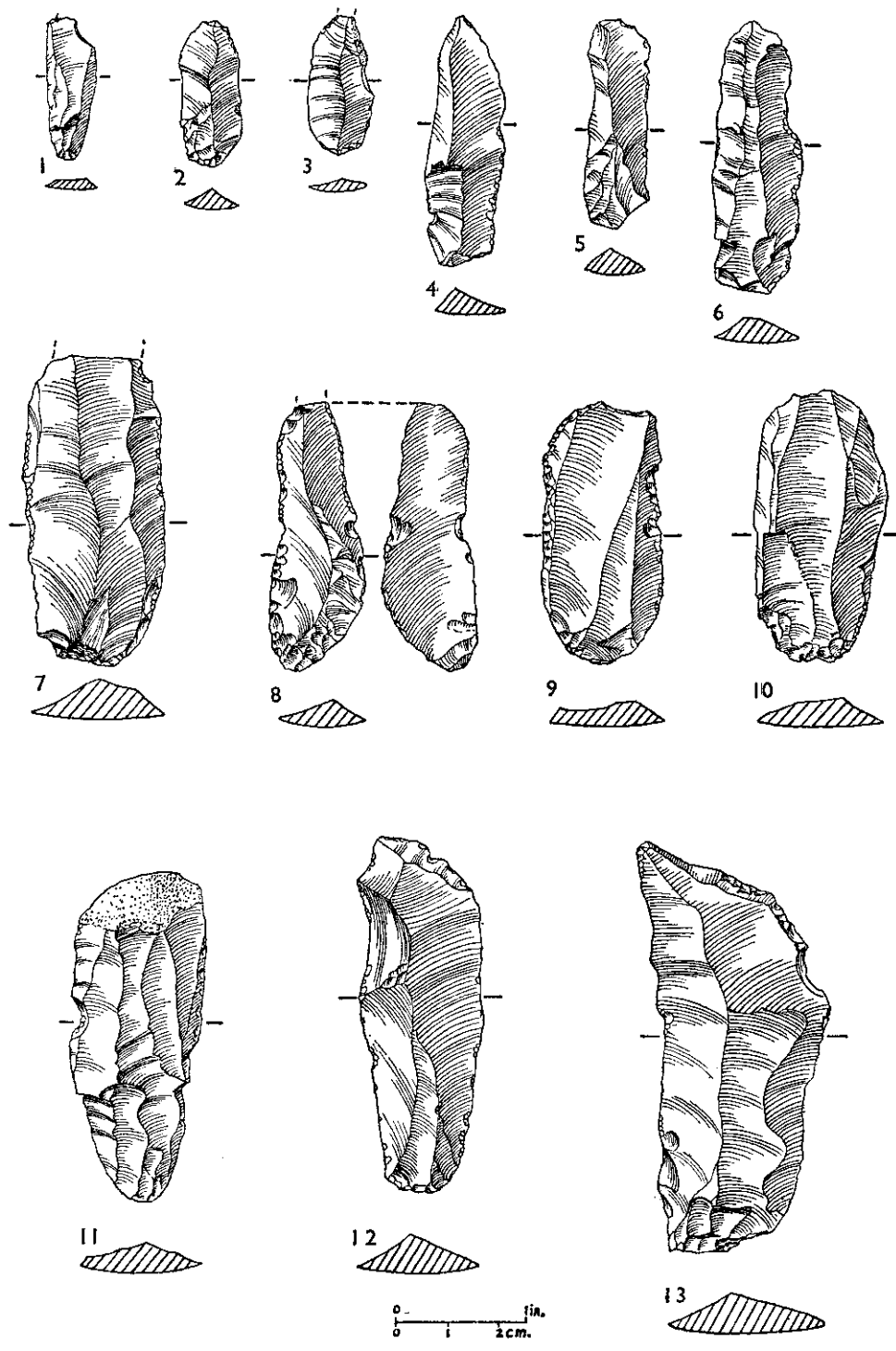


FIG. 9. 100-Acres, Denham: plain, utilised and retouched flakes and blades. All of flint.

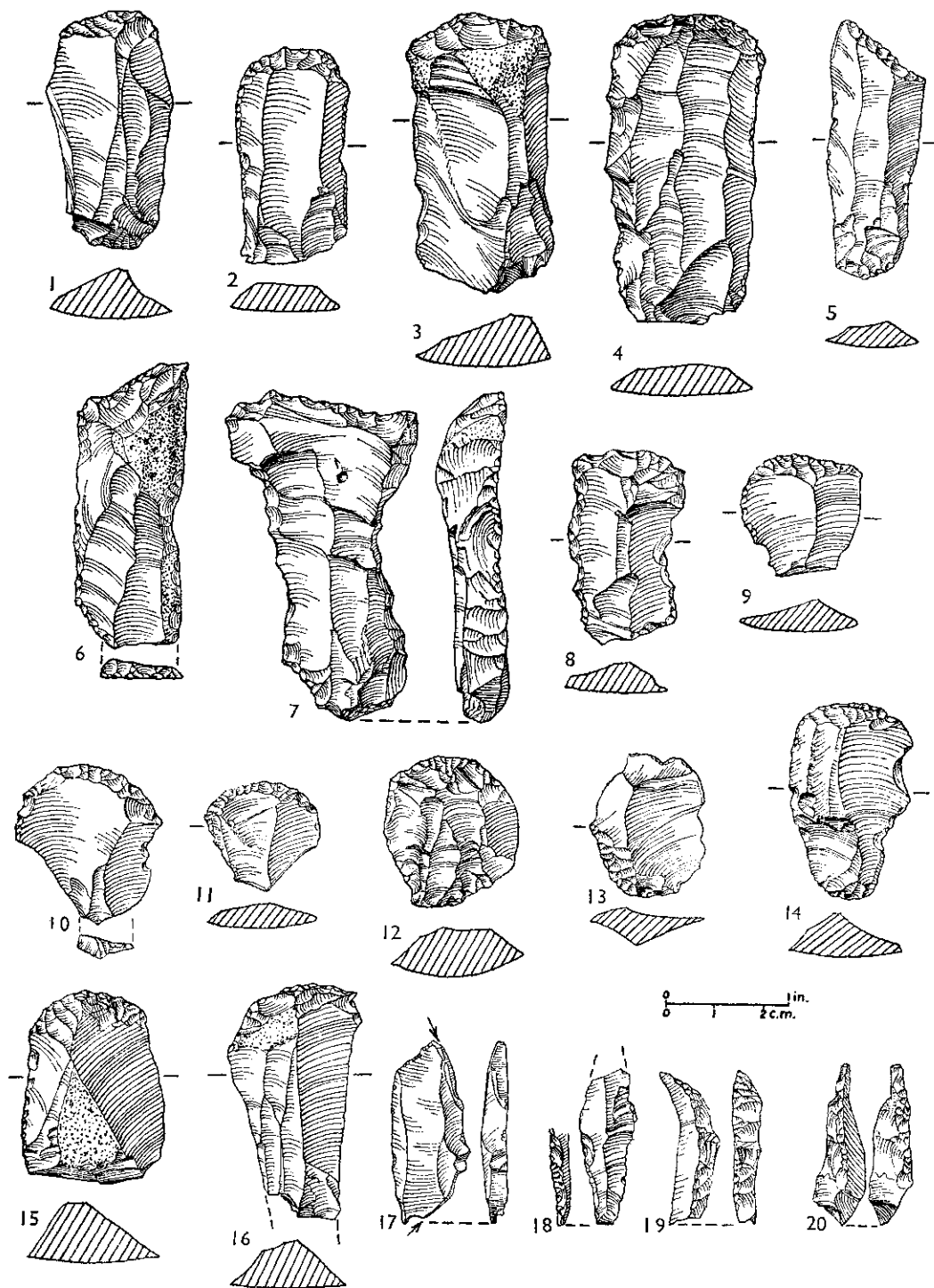


FIG. 10. 100-Acres, Denham: 1-16, scrapers; 17, graver; 18, knife; 19-20, trimmed and utilised fragments. All of flint. (Nos. 1, 3, 4, 8-12, 14-16, *B.M. regd. no. 44*; nos. 17-20, *B.M. regd. no. 43*.)

been removed from a piece of flint under early treatment, and not from a true core, no. 3 (44) is not convexly curved at the working-end which is shaped by the meeting at an angle of two straight dressed edges. Its companion no. 4 bears delicate trimming, quite like the best examples of Upper Palæolithic workmanship, at the end of an exceptionally wide blade that had evidently been detached from elaborately flaked-down material. In this respect this group differs from that of Broxbourne in which end-of-blade scrapers do not occur.

A departure from the common form of end-scrapers-on-blade with convex working-edge appears in such selected items as nos. 5 and 6, which are trimmed along the rim of an oblique truncation at the upper end of fine blades. The first shows some wear also at the lower end. As the second (6) also bears fine dressing under the thin butt and along the lower part of both left and right margins the tool is compound. With it no. 7 can be ranked, only it is a much thicker instrument. High edge-working extends almost all round from its wide oblique end. Probably this implement was used for such heavier work as the preparation of wood and bone, unlike the finer examples that most likely served in treating flesh and skins. The drawing shows its faintly concave long sides below a sort of shouldering formed by the expanded upper corners. No. 8 (44) is a small version of a compound tool that resembles no. 6.

(C) Small round scrapers, present in quite a considerable range, credibly exemplify here the adoption of tool-forms which are relatively rare in Upper Palæolithic contexts but frequent from Mesolithic times until stone ceased to be used for tools. A choice has been drawn, Fig. 10, nos. 9 (44), 10 (44), 11 (44) and 12 (44), with such variants as the side-scrapers no. 13 (44), and no. 14 (44) as a form intermediate between the round scraper and the definitive end-scrapers-on-blade. Dressed on a rather steep flake, this individual (no. 13) serves introductorily to a batch of high end-scrapers on thick broken pieces, as nos. 14 (44) and 15 (44). Both of these recall a type often met with in the yield of Upper Palæolithic sites.

(D) Among so many products of this thriving industry, in which much betokens survivals of activities and persisting craftsmanship of Upper Palæolithic predecessors, it appears remarkable that only one really good graver seems worth illustrating, Fig. 10, no. 17 (43). As a small implement of the kind one usually connects with the working of bone or wood in late Old Stone Age and descendant Mesolithic industries, this example is provided at both ends with a characteristic narrow, chisel-like transverse edge. This was simply achieved on a short, thick flake by the backing of a graver-facet against a convenient edge. To readers unfamiliar with this kind of tool and its manufacture, the arrows in the drawing may prove helpful to show the direction of the blow dealt at the extremities of the parent flake to detach the sliver of flint, attaining thereby the desired working-end.

(E) Suggestive of a tanged point of the type met with in late Upper Palæolithic and descendant early Mesolithic industries in the Baltic area, the broken specimen, no. 18 (43) in Fig. 10, may be regarded as a narrow knife. Wear along its right edge supports this opinion, which is even better upheld by the steep blunting of the lower part on the left. Apparently this implement was



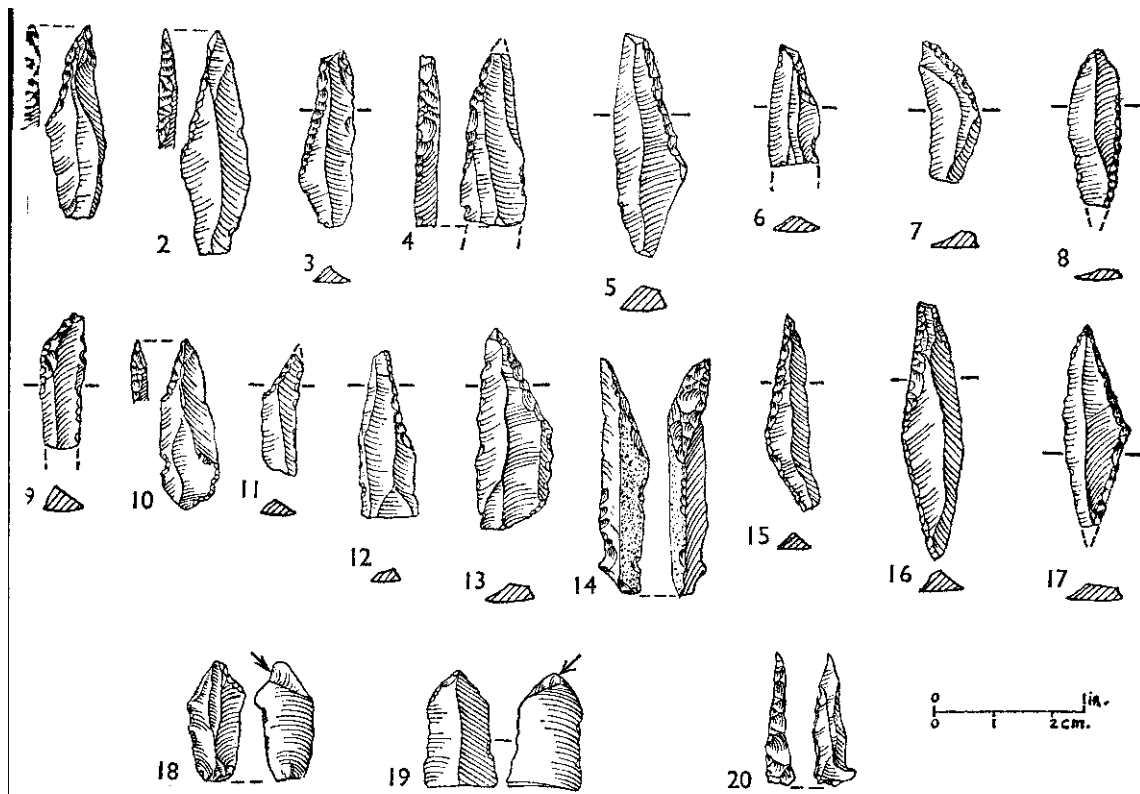


FIG. 11. 100-Acres, Denham: 1-17, 20, microliths; 18-19, micro-burins. All of flint.  
 (Nos. 1-17, 20, *B.M. regd. no. 43*; nos. 18 and 19, *B.M. regd. nos. 47 and 48*.)

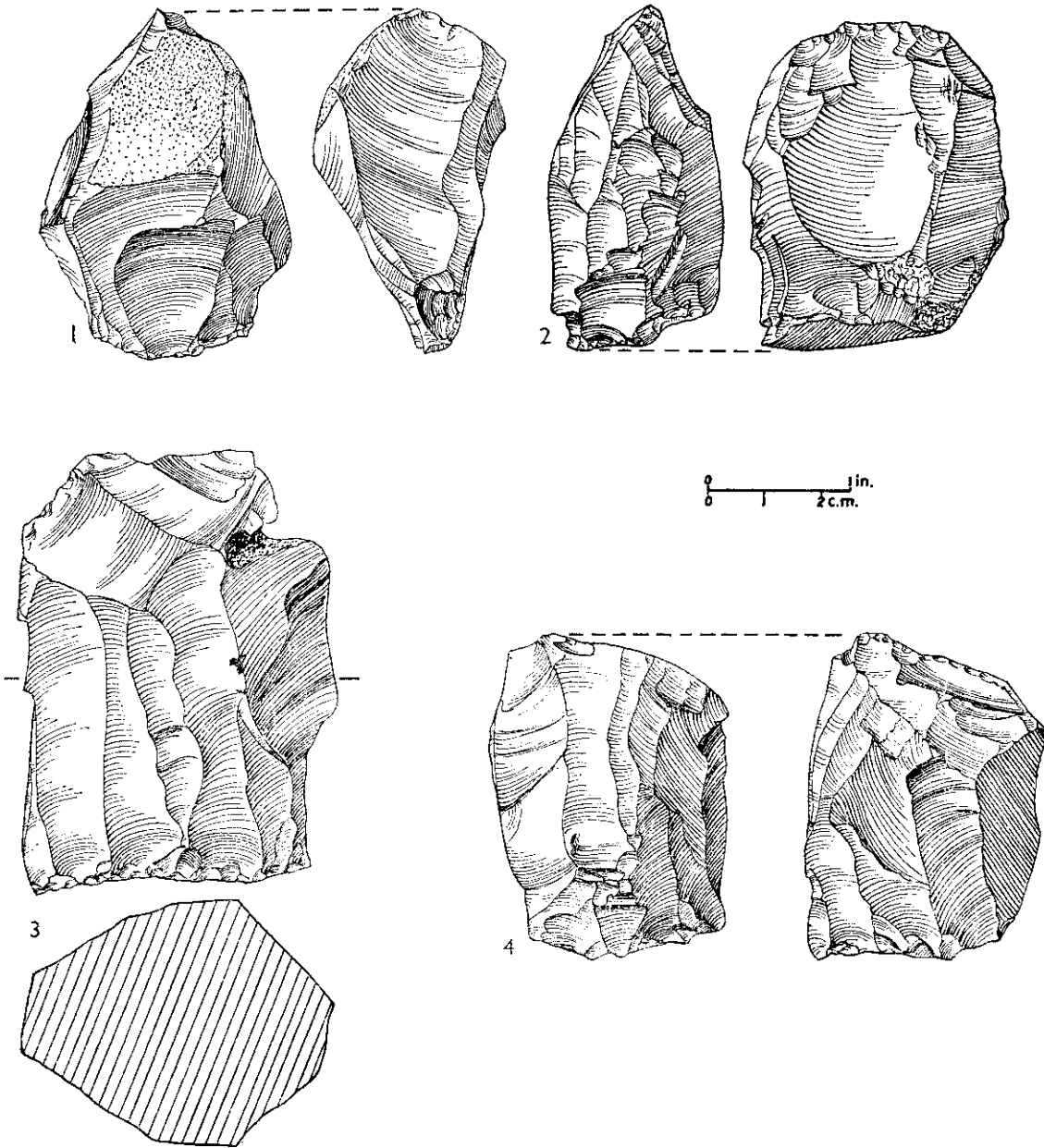


FIG. 12. 100-Acres, Denham: cores, all of flint. (No. 2, *B.M. regd. no. 45.*)

dressed thus to facilitate its insertion into a handle consisting of a hollow bone or piece of wood. Lastly, two flints, nos. 19 and 20 (both B.M. 43), steeply faceted and worn along the edges of the relatively high sides, seem to be implements improvised on waste fragments because of the appeal of their conveniently curved margins.

By reason of their steep working, the last (all B.M. 43) three specimens commented upon, nos. 18, 19 and 20, bring to mind the microlithic element that has been noted as important at fenland Mesolithic sites. Without going so far at present as to consider for comparisons the microliths found in Baltic lands or even at Star Carr in Yorkshire, but keeping to the Home Counties, we recall the imposing series from the valley of the Lea at Broxbourne and a glimpse of microlithic technique on Colne waters at Harefield, Middlesex,<sup>28</sup> upstream from the 100-Acres. Nearer still we have seen the goodly array (Fig. 4) from the site at Sandstone, a little over a mile downstream in Buckinghamshire.

(F) Over the years quite a considerable number of the characteristic, steeply trimmed artifacts were separated by Haward from the other ranges of the industry. Although many specimens lack the tip, the evidence of their treatment and the complete forms proclaim identity with the regular items that mark the Maglemosean facies of the datable earlier groups typified in the marsh flats of the Thames tributaries. Here, then, at the 100-Acres the particular aspect of the whole assemblage is that manifest at Broxbourne, Herts., and at Sandstone, Iver, Bucks., at both of which the Maglemosean Mesolithic facies is so distinct in the flaking industry. Basically narrow blades, the finished articles are not to be confused with the fine and very delicately dressed objects found in later Mesolithic industries, especially the so-called Tardenoisian, whether productive of non-geometric shapes or of the later, evolved geometric types.

That so many of the artifacts trimmed in microlithic style in this collection are fragmentary reminds one that the same state of affairs obtained at Broxbourne and Sandstone. However, a muster of the best-preserved, steeply dressed, small implements in the assemblage from Boyer's pit shows in the main how they appear (Fig. 11). Seemingly, in turning out microlithic forms, the flint-workers were chiefly concerned with points. Doubtless these were intended as barbs for inserting into slots practised in bone and wooden heads of fishing- and fowling-gear. Thus, most of the small artifacts were armatures or components, rather than independent tools.

Simple points, obliquely blunted, compose the principal output of the microlithic industry. The commonest are those treated on the left-hand margin, e.g., Fig. 11, nos. 1-4 (43), 8-10 (43). The first four are seen to be blunted only on part of that edge, while each individual of the trio (9, 10 and 11) shows signs of slight working in places on the opposite. Of the points dressed on the right, only nos. 5 and 6 are unaffected elsewhere. No. 7 deceptively resembles a crescentic microlith but this look is illusory, since, unlike this true convexly curved form, the specimen is only trimmed along the upper part of the edge. All their companions, nos. 8, 12 and 14 (43), however, bear more or less distinct marginal retouches on the edge opposite that fully treated.

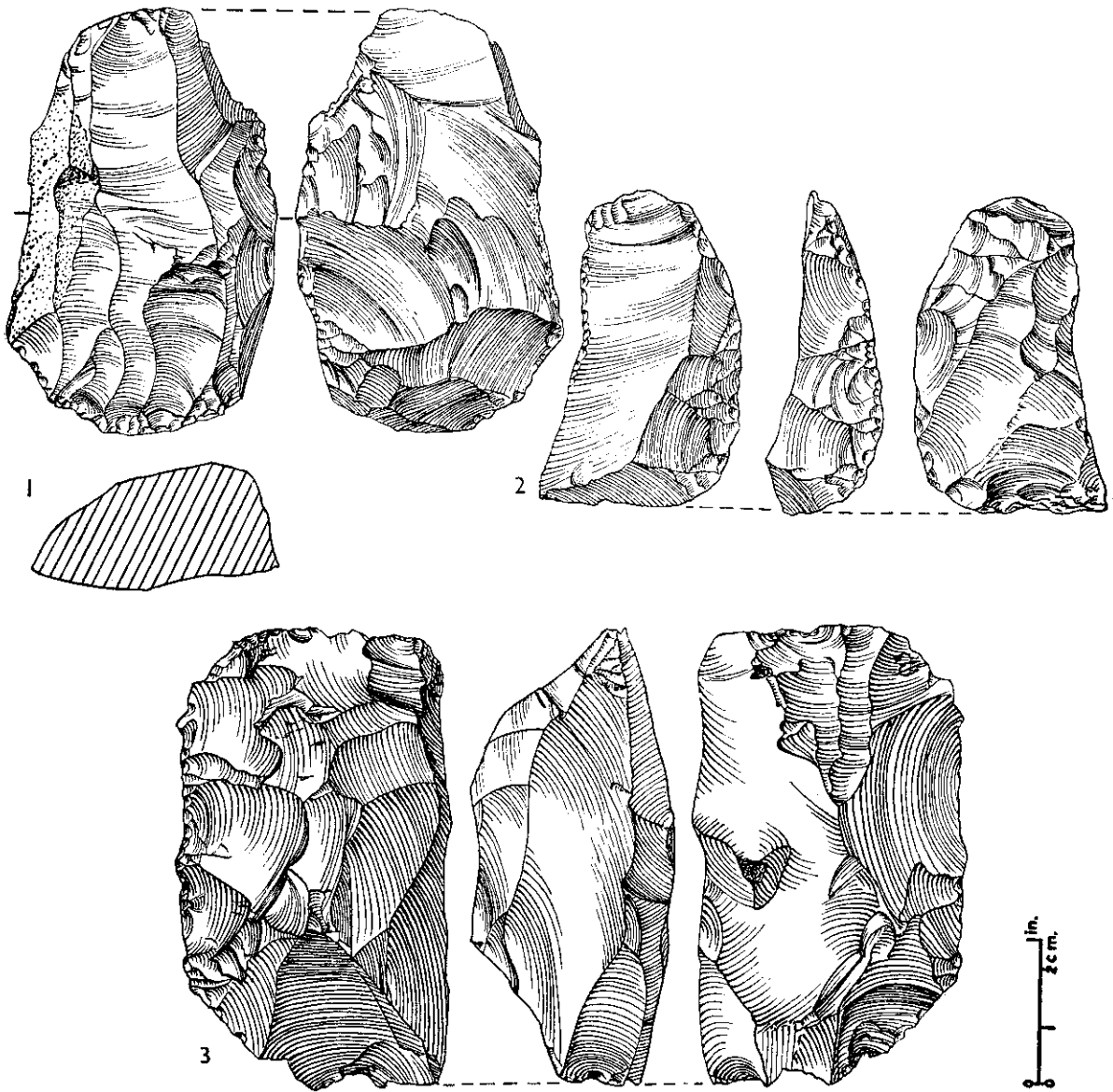


FIG. 13. 100-Acres, Denham: 1, *tranchet* axe; 2, waste sharpening-flake; 3, chopper or side-scraper. All of flint. (No. 3, *B.M. regd. no. 45.*)

In one or two it is difficult to distinguish later injury from dressing. Not to be taken for a crescent of later type, no. 15 (43) is blunted only along the whole length of its left edge, thus contrasting with nos. 16 and 17, neither of which is a true triangle. Both, besides being trimmed along the whole of an edge, exhibit traces of marginal blunting opposite.

Inspection of these finished articles and the presence of two micro-burins, nos. 18 and 19 (47 and 48), show that the specialised method of manufacturing many microliths, which was glimpsed above, obtained in this industry. Of the more usual kind of micro-burin, no. 18 (47) is from a blade notched on the right, while no. 19 (48), a much rarer sort, came from a piece hollowed on the left in the upper part of a blade.

Considering the number of relics that point to the fashioning of certain fine implements by micro-burin technique, it is strange that there have been recognised so few specimens of the typical waste. Simpler methods were also in vogue, for among the fine artifacts trimmed like microliths, though not made by the micro-burin technique, an awl, Fig. 11, no. 20 (B.M. 43), that belongs to an elementary order completes the present list.

(G) Cores are numerous as the remnants of the industrial riving of nodules, flakes and blades. Owing perhaps to the availability of flint in common with those at Sandstone, the knappers at 100-Acres do not seem to have worked down the material so much as at some other sites. Hence there is little variety in the series of cores from the 100-Acres. Only, whereas few from here approach the familiar pyramidal shape, e.g., Fig. 12, no. 1, such as abounds at Sandstone, the trend is mainly to quadrate fluted lumps, as nos. 2 (B.M. no. 45), 3 and 4. All show by their scars the range of blades removed, from long and wide parallel-sided for general purposes as knives and scrapers (Figs. 9 and 10) to pointed and narrow for finer instruments and microliths (Fig. 11).

Though no acceptably true core-scraper can be illustrated from 100-Acres, it is yet likely that cores with attractively suitable edges served as scrapers or planes without added treatment.

(H) There is an important but sparsely represented class of tools in Haward's collection. Its most significant constituent is the *tranchet* core-axe, Fig. 13, no. 1. Like similar implements from Broxbourne, Sandstone (Iver), Harefield, and Thatcham, all in tributary valleys of the Thames, this specimen from Boyer's pit at the 100-Acres is flaked completely in typical Baltic Maglemosean manner; and at its lower end it exhibits the characteristic scar that resulted from a blow struck across the width of the implement in the making. With it there is illustrated a flake, no. 2, detached in the production of the first cutting-edge of such a *tranchet* or in the re-sharpening of one. The presence of these objects further proclaims the identity of the industry at 100-Acres with the well-represented yield of Maglemosean working-floors elsewhere. Partaking somewhat of the *tranchet* no. 1 by its bold flaking, the core-tool no. 3 (B.M. no. 45) may be regarded as a chopper or heavy side-scraper, the effective edge of which is on the left-hand margin.

## V. CULTURAL AFFINITIES

Although no bone-work was found at Sandstone and 100-Acres (Boyer's),

the flints from both places are so distinctive as to link the producing industries with those at Broxbourne, Herts. Long held to typify the Maglemosean lithic facies in Britain, this, however, is more properly represented by the late Pre-Boreal, and therefore earlier, assemblage from Star Carr, Seamer, Yorks.<sup>29</sup> Here it is strongly supported by characteristic barbed and plain antler points in association with *tranchet* axes, blade tools, scrapers and graters. The microliths, too, from Star Carr are similar to, but proportionally more numerous than, those in the Buckinghamshire groups. Now, these two groups can be correlated with the Broxbourne series, and they stand at present as the most comprehensive ranges of Mesolithic artifacts from the Colne valley. Hence there can be marshalled with them on the score of typology and approximate contemporaneity the fine but not so rich sets from Dewe's (Hartley's) pit and Dewe's Farm, Harefield, upstream from Sandstone and the 100-Acres, which were recently brought to notice by the author.<sup>30</sup> Neither of these two Middlesex sites yielded worked bone. The converse is the case with the many objects made of bony substances worked or ornamented in the Maglemosean manner from the bed of the Thames, or found in circumstances suggesting that the relics came from ancient marshes along the main river in the London area. In these respects one has in mind the unilaterally jagged points from Wandsworth and Battersea,<sup>31</sup> the bone of the extinct great ox (*Bos primigenius* Boj.) with an incised chevron-pattern from Hammersmith,<sup>32</sup> several perforated pieces of red deer antler ground to axe- and adze-like working edges, and sundry sleeves of the same material socketed for holding stone heads.<sup>33</sup> Recovered by dredging or utilitarian excavations at different places, none of these can be said positively to have been found directly connected with any of the numerous stone implements of Mesolithic types also collected.

Beyond mentioning that the Mesolithic industries of the Colne valley are of course related to these finds along the Thames, the author need not really go far with the cultural affinities of the implements from Sandstone and the 100-Acres. These belong to the categories that have been magisterially reviewed in their wider implications by Professor Clark. During the past few years many of them and several local assemblages and their mode of occurrence have been ably studied also by the late W. F. Rankine<sup>34</sup> and by Dr. G. J. Wainwright<sup>35</sup> with special reference to the spread of Maglemosean strains from eastern to south-central and western England, and beyond the Severn estuary.

Just as the Thames basin with the valleys of its chief stream and greater tributaries afforded routes whereby Lower Palæolithic people made their way westward and eventually in small bands gained certain high grounds, so ages later it likewise served migrants equipped in the Maglemosean manner. Only, from the artifact evidence it appears that these Mesolithic folk long favoured the riparian fens and marshes, sojourning on islets and gravel banks where they could. Even today it is not difficult for the inquirer to visualise the environment of their choice and habit such as generations of them knew in the Baltic area, across the upraised floor of the North Sea, along the extended coastal grounds and the undrained lower reaches of the larger rivers, including the Thames and its feeders. He has but to look over such expanses as the Harefield Moor, down the Colne valley south of Richings Park and West Drayton

towards the Staines reservoirs, and upon the scrub-, heath- and rush-grown tracts along the Kennet in Berkshire with its channel locally widening into small lakes, almost as far upstream as Fyfield near its source in Wiltshire. The contemplation of the comparable and as yet unreclaimed tracts in Bucks. may lead the archæologist to locate Mesolithic occupation-sites in an area that still holds promise. This seems the more possible in that near Staines there comes ample evidence that quite early Neolithic folk were established amidst the subsidiary channels of the Colne and their meanders.<sup>36</sup>

Comparing the Mesolithic sites and their industrial yield at Sandstone, the 100-Acres and Harefield in the Colne valley and Broxbourne beside the Lea with the context disclosed at Thatcham in the Kennet fens, one sees how close are the geological, palæobotanical and archæological links. The inquiries, conducted at the last-named by Mr. Wymer from 1956 onward, following after many years the researches of the late Harold Peake and O. G. S. Crawford<sup>37</sup> and of others here,<sup>38</sup> also near and within Newbury, revealed under Late Boreal peat a flint industry as rich as any found by his predecessors, and as comprehensive as each one from the stations in Buckinghamshire, Middlesex and Hertfordshire, but with the most interesting complement at Thatcham of artificially cut red deer antlers and two bone points. This constitutes, therefore, the first find in proven association of stone and osseous artifacts of Maglemosean facies outside Yorkshire.<sup>39</sup> Kintbury, a few miles farther up the valley of the Kennet, has also provided evidence under flood deposits of the push westward of Mesolithic strains.<sup>40</sup>

With the small groups and odd flint implements like *tranchets* and steeply dressed blade implements reported from a few places in Berkshire beyond the Newbury district, and nearer the upper reaches of the Kennet River, we are not really concerned. Their implications have been considered by several competent archæologists, among whom are those already named.

Made in circumstances quite different from those discussed above, other discoveries of apparently related stone industries are of considerable importance in the early post-glacial human history of Buckinghamshire. At least one such instance testifies to a diversion of the migratory trend from the main valley towards the high grounds to the north. It is represented by the flint factory site found by Dr. A. E. Peake about fifty years ago on the lands of Kimble Farm, between Fawley and South End, in a most picturesque part of the Chilterns.<sup>41</sup> Referable probably to a time not late in the Atlantic climatic phase, and therefore likely to be of greater antiquity than many other surface-found sets of Mesolithic aspect, the comprehensive array of finely executed implements gleaned by Peake from the field at about 600 ft. O.D. precisely matches the clutches from the river-side stations in the valleys of the Colne, Lea and Kennet. The industry of Kimble Farm may well be of an age with that Mr. J. P. T. Burchell found stratified at Lower Halstow in the Medway estuary, Kent.<sup>42</sup> Determined by pollen-analysis to belong to the Atlantic climatic phase, this is regarded as an equivalent of Baltic Ertebølle (Forest Culture Period III) industry. It represents an early independent growth in south-eastern England following the marine transgression of Late Boreal times, which, by severing

the land-connexions with the Continent, prevented the natively developed Maglemosean industries from receiving fresh increments.

Identical craftsmanship and typology are obvious in the various items and groups which at Kimble Farm include *tranchet* axes, scrapers, blade tools and a fair microlithic element. The reduced size of the flaked axes, however, would indicate that the settlers could only cope with small wood. Otherwise their outfit is seen to be quite compatible with the traditional palustral and riparian kit of Mesolithic hunters, fowlers and fishers, which, like the principal relics from the sites beside the Colne, pertains to what Clark once described as the non-geometric microlith cum *tranchet* axe industries.<sup>43</sup>

Had they been found beside the Thames, say near Henley three miles south, the products of an industry like that at Kimble Farm would assuredly be ascribed to the exponents of a food-gathering culture based on the Maglemosean tradition.\* Of this we have traced above the proofs of its strength and penetration in early post-glacial times. By the same tokens the place of some hitherto unknown or insufficiently recorded Stone Age relics in this county has, it is thought, been determined as belonging to a late part of the great phase in the Mesolithic colonisation of Britain between 10,000 and 7,000 years ago.

## VI. CONCLUSIONS

1. The River Colne in Buckinghamshire is the main constituent of a complicated hydrographic system with many feeders and subsidiary channels. From the borders of the county with west Middlesex and south-west Hertfordshire to its confluence with the Thames, the Colne flows in a valley that comprises wide tracts of alluvium. Upon these are fens, marshes and moors with an appropriate natural vegetation of rushes, sedges, grasses, ferns, heath, shrubs and small trees.

2. The alluvium of the Colne valley is of post-Pleistocene age, and therefore referable to the Holocene or Recent epoch of the geologist. It rests upon flood-plain gravel laid down during late Pleistocene times. Hence, in terms of the archaeological chronology, the flood-plain gravel is of Upper Palæolithic age.

3. At several places in the part of Buckinghamshire considered, the flood-plain gravel has been exploited. In broaching its overburden at Sandstone in Iver parish and 100-Acres in Denham, the contractors' operations revealed that the alluvial beds consist of peats, muds and shell-marl, and that while the top of the underlying gravel is normally flush with the water-level it lies locally above or below.

The flood-plain gravel has yielded lumps of most ancient peat and the bones of a late Pleistocene fauna. So far it has not produced contemporary organic or industrial remains of man.

4. From the alluvium there have been taken fragments of trees, mainly

\* Since this was written, a most careful account by Mr. F. R. Froom has appeared on stratified and open-air sites of his finding between Newbury and Hungerford which have yielded artifacts of Mesolithic facies. What he says tends to support the very opinion I express above. ("The Mesolithic around Hungerford", in *Trans. Newbury Field Club*, vol. xi, pt. 2, 1963, pp. 62-87.)



birch, pine and hazel with some hazel-nuts, animal bones and antlers of red deer, chiefly from the lowest peaty deposit, besides flint implements, and odd potsherds near the topsoil. These antiquities are of different periods, the oldest being the flint artifacts from the basal part of the peat and from the top of the flood-plain gravel.

5. Methodical excavations were conducted at the Sandstone site where gravel was formerly won, and where the plant of the Central Electricity Authority now stands. Their purpose was to check observations made here during commercial digging and to link these with the notes taken long ago of workings by Wm. Boyer & Sons Ltd. at 100-Acres. They have confirmed the mode of occurrence of the artifacts in the lowest and locally stony part of the peat or on top of the gravel beneath the alluvial beds.

6. As at Broxbourne, the base of the peat containing some flints and resting immediately upon the artifact-yielding top of the flood-plain gravel at Sandstone, Iver, has been determined by pollen-analysis to be of Late Boreal Age. It is believed that at both places and at the 100-Acres (Boyer's), Denham, the artifacts had lain upon a ridge or islet of gravel. This was rapidly overwhelmed by rising water not long after its occupation by food-collecting bands encamped amid the fens of the valley.

7. In facies the output of the active, comprehensive prehistoric industries from these two Buckinghamshire sites is identical with that of the flint artifacts which were found in similar conditions in Rikof's pit, Broxbourne, Herts., and which have long been held to typify the Maglemosean stone industry in Britain.

The circumstances of their discovery and the typology of the implement groups proclaim that the products of the Sandstone and 100-Acres industries can also be ranged with stone tools and cognate, plain and ornamented bone and antler objects as well as hunting-, fowling- and fishing-gear made elsewhere in Maglemosean style. The examples in point have come from fenland stations and the banks of lakes on the East Coast and along the main and tributary rivers in the London area and far up the Thames basin.

8. In such an environment the exponents of the flint-working at Sandstone and 100-Acres lived like the Maglemoseans of the Baltic area. Herein as hunters, fowlers and fishers they had developed during the Pre-Boreal climatic phase and succeeding Boreal (between *ca.* 7800 and 5000 B.C.) the mixed industries that belong to Period II of the post-glacial complex of Forest Culture. In similar and familiar conditions the strains of this were brought over the then upraised bed of the North Sea that extended the European plain and afforded land-bridges for generations of migrant bands.

9. The scarred axe- and adze-like flint tools in true Maglemosean tradition and waste from their manufacture, besides the steeply edge-blunted small forms in the collections from the sites on the low grounds in the Colne valley in Iver and Denham parishes, are so typical as to dictate the adding of the assemblages to the list of Mesolithic *tranchet* cum microlith industries of England. Already this facies has been recognised in Buckinghamshire, but only in a comprehensive industry from an open site on high ground.

10. To summarise the artifacts reviewed above, one can say that they

belong to the mid-period of the great spread of Mesolithic industry in south-eastern England between ten and seven thousand years ago. This report is the first to appear in the journal of a learned society on the only known objects of that period to have been found stratified in Buckinghamshire. It is to be hoped, therefore, that this notice may suggest further researches that will show the greater riches of the Mesolithic or Middle Stone Age in the county.

#### ACKNOWLEDGMENTS

First, the author pays tribute to the memory of the pioneer inquirers named in the foregoing sections, who, over thirty years ago and until their death, placed knowledge of the terrain and collections so freely at his disposal. He wishes also to thank proprietors and lessees, Wm. Boyer & Sons Ltd., London, W.2, Willment Bros. Ltd., London, S.E.1, Sandersons Fabrics Ltd., Uxbridge, and the Central Electricity Authority, for leave to visit the ground and to inspect exposures and sections in gravel-workings and other openings. The last-named, particularly, showed great interest in the investigations, and the officers concerned kindly afforded every facility together with manual and mechanical help.

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<sup>1</sup> 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], p. 227.

<sup>2</sup> 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.

<sup>3</sup> J. G. D. Clark, *The Mesolithic Settlement of Northern Europe*, Cambridge, 1936, pp. 25, 31 and 220.

<sup>4</sup> *Ibid.*

<sup>5</sup> 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. lxxiv, 1934, pp. 101-28.

<sup>6</sup> 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. 189-90.

<sup>7</sup> A. D. Lacaille, "Mesolithic Facies in Middlesex and London", in *Trans. Lond. and Middx. Archaeol. Soc.*, vol. xx, pt. iii, 1961 [pp. 101-50], p. 117.

<sup>8</sup> *Ibid.*

<sup>9</sup> *Idem*, "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.

<sup>10</sup> Dated Dublin, 2nd February 1956.

<sup>11</sup> Warren, Clark, Godwin, Godwin and Macfadyen, *op. cit.*, 1934, p. 125.

<sup>12</sup> Pp. 146-8.

- <sup>13</sup> Lacaïlle, *op. cit.*, 1961, pp. 123–5, and Fig. 4, p. 122.
- <sup>14</sup> *Ibid.*, pp. 125–8.
- <sup>15</sup> *Ibid.*, pp. 103, 109 and 117–23.
- <sup>16</sup> John Wymer, “Excavations on the Mesolithic Site at Thatcham, Berks.—1958”, in *The Berkshire Archaeol. Journ.*, vol. lvii (1959), pp. 1–33.
- <sup>17</sup> J. G. D. Clark, *Excavations at Star Carr*, Cambridge, 1954, chaps. iv and v.
- <sup>18</sup> *Idem*, *The Mesolithic Age in Britain*, Cambridge, 1932, pp. 16–18. The author considers finds made on the east Yorkshire coast by Mr. B. Morfitt in 1903 and in 1922–23 by Mr. A. L. Armstrong (*Man*, 1922, No. 75, and *ibid.*, 1923, No. 31).
- <sup>19</sup> [R. A. Smith] *A Guide to Antiquities of the Stone Age . . .*, British Museum, 1926, p. 155; Clark, *op. cit.*, 1936, pp. 96, 116–17.
- <sup>20</sup> The present writer has discussed these objects and examined much of the literature relating to them in his “Scottish Micro-burins”, in *Proc. Soc. Ant. Scot.*, vol. lxxxvi, 1941–42, pp. 103–19.
- <sup>21</sup> Clark, *op. cit.*, 1932, p. xxii.
- <sup>22</sup> Warren, Clark, Godwin, Godwin and Macfadyen, *op. cit.*, 1934, pp. 115–19, and Fig. 9, no. 116.
- <sup>23</sup> M. A. C. Hinton and A. S. Kennard, “The Relative Ages of the Stone Implements of the Lower Thames Valley”, in *Proc. Geol. Assoc.*, vol. xix, 1905–6, p. 95.
- <sup>24</sup> Clark, *op. cit.*, 1932, p. 67; *idem*, *op. cit.*, 1936, pp. 88 and 237.
- <sup>25</sup> Hinton and Kennard, 1905–6, *loc. cit.*
- <sup>26</sup> Lacaïlle, *op. cit.*, 1961, pp. 118–21.
- <sup>27</sup> *Op. cit.*, 1905–6, p. 95.
- <sup>28</sup> Lacaïlle, *op. cit.*, 1961, pp. 118–19.
- <sup>29</sup> Clark, *op. cit.*, 1954.
- <sup>30</sup> Lacaïlle, *op. cit.*, 1961, pp. 118–21.
- <sup>31</sup> Clark, *op. cit.*, 1932, p. 18.
- <sup>32</sup> R. A. Smith, “Examples of Mesolithic Art”, in *The British Museum Quarterly*, no. 21, vol. viii, no. 4, 1934, pp. 144–5, and pl. xlvi, 6; Lacaïlle, *op. cit.*, 1961, p. 137, and Fig. 8, 1.
- <sup>33</sup> Lacaïlle, *op. cit.*, 1961, pp. 132–7, and Fig. 7.
- <sup>34</sup> W. F. Rankine, *The Mesolithic of Southern Britain*. Research Paper No. 4, Surrey Archaeol. Soc., 1956.
- <sup>35</sup> G. J. Wainwright, *The Mesolithic Period in South and Western Britain*. Thesis for the Ph.D. degree submitted to the University of London Faculty of Arts, 1961.
- <sup>36</sup> R. Robertson-Mackay, “The Excavation of the Causewayed Camp at Staines, Middlesex”. Interim Report. *Archæol. News Letter*, vol. 7, no. 6, Jan./Feb., 1962, pp. 131–4.
- <sup>37</sup> H. Peake, “Mesolithic Implements at Newbury”, in *Trans. Newbury and District Field Club*, vol. vii, 1934, pp. 50–1; *idem* [and O. G. S. Crawford], “A Flint Factory at Thatcham, Berks.”, in *Proc. Prehist. Soc. East Anglia*, vol. iii, pt. iv, 1922, pp. 499–514.
- <sup>38</sup> E.g., S. Palmer, “On the Antiquities found in the Peat of Newbury”, in *Trans. Newbury and District Field Club*, vol. ii, 1878, pp. 123–34; [W.] Money and [E. P.] Richards, “Prehistoric and Mediæval Antiquities Discovered at Newbury during the Drainage Operations in 1894”, in *ibid.*, vol. iv, 1895, pp. 259–60.
- <sup>39</sup> Wymer, *op. cit.*, 1959, pp. 19–20.
- <sup>40</sup> *Ibid.*, p. 3.
- <sup>41</sup> A. E. Peake, “A Prehistoric Site at Kimble, S. Bucks.”, in *Proc. Prehist. Soc. East Anglia*, vol. ii, pt. iii, 1914–18, pp. 437–58.
- <sup>42</sup> J. P. T. Burchell, “The Shell-mound Industry of Denmark as represented at Lower Halstow Kent”, in *ibid.*, vol. v, pt. i, 1925, pp. 73–8; *idem*, “Further Report on the Epi-Palæolithic Factory Site at Lower Halstow, Kent”, *ibid.*, vol. v, pt. ii, 1927, pp. 217–33; *idem*, “A Final Account of the Investigations carried out at Lower Halstow, Kent”, *ibid.*, vol. v, pt. iii, 1928, pp. 288–96.
- <sup>43</sup> Clark, *op. cit.*, 1932, p. 95.