AN ACCOUNT OF A FLINT FACTORY, WITH SOME NEW TYPES OF FLINTS, EXCAVATED AT PEPPARD COMMON, OXON.¹

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It is intended to give in this paper a brief account of the discovery and the yield of two flint mines or factories situated at Peppard in Oxfordshire, a small village on the Chiltern hills, four miles from Henley-on-Thames and six from Reading; and to endeavour to fix the true date of these mines by comparison with the other well-known sites of similar character. It was at the end of January, 1912, that I first started to excavate, being led to do so by finding in the ploughed field, below a saucer-shaped depression in the grass (site 1), a large quantity of roughly chipped flints suggesting the neighbourhood of a flint factory. Encouraged by the results, at the end of October, 1912, I cut an experimental section in a shallow depression on the same slope, about forty yards to the north of the first, and here was discovered the prolific factory site, which will be designated as no. 2.

The specimens to be described came from these two neighbouring but distinct sites, nos. 1 and 2. The accompanying map (fig. 1) shews their position upon the eastern slope of the valley which, commencing at Highmoor, forms the dip of Peppard common, and curves to the south-east, to join the main valley of the Thames at Harpsden. It is carved out of the upper chalk either by ice, or by a stream which may yet run beneath the surface. The high ground to the eastward above the slope is 324 feet above ordnance datum and is capped with plateau gravel, from which are derived the various extraneous rocks occurring in the different layers of the two sites.

The dimensions of the two sites are as follows: site no. 1 is a deep hollow cup in the grass on sloping ground,

¹ Read before the Institute, 12th February, 1913.
(1) Site 1. (2) Site 2. (3 and 4) Large chalk-pits shewing five to six layers of flints 3 feet apart. (5, 6, 9, 10) circular cup-shaped depressions in the grass: of these some eighteen or twenty in the neighbourhood may be mines or old chalk-pits. (7) a group of three pits, ranged round a vallum and ditch. (8) broad vallum and ditch, supposed to be part of Grim's Ditch.

In the field below no. 9 are numbers of flakes and cores similar to those found on the slope below sites 1 and 2.
measuring 65 feet by 50 feet. I have not been able to
gauge the exact dimensions of the chalk shaft, but have
excavated to a depth of 13½ feet over an area of 25 by
30 feet, and have defined its upper and lower sharp
margins (figs. 2 and 3.)

Site no. 2 is a shallow cup, higher up the slope some
40 yards to the north, measuring 35 by 65 feet. The
actual floor of this site, as far as I have excavated it,
is 42 feet by 15 feet. This site has an average depth of
3½ feet, with pockets extending into the chalk to 5 feet,
probably where the flint was excavated (fig. 4).

In connexion with fig. 3, which represents a transverse
section through the centre of the pit on site 1, the
following facts should be noted: (1) the upper flint
layer is not derived directly from the chalk, but comes
from the plateau gravel above referred to. It is sub-
angular, and partly water-worn, with lustrous fractured
surfaces. It is not excavated flint. In regard to the
derivation of the layer of sandy gravel containing small
water-worn flint and quartz pebbles I found, 20 feet to
the north of the depression, a layer of this gravel some 3 feet
in thickness. It is no doubt rainwash derived from the
plateau gravel.

(2) The two lower layers are chalk flints, many large
masses showing human work. They probably represent
two periods of mining. The presence of these chipped
blocks negatives a theory that these two layers were formed
by the dissolution of the chalky bands between them.

(3) The charcoal band shows where a fire was kindled
by the miners before the second period of mining.

(4) Neither layer of flint has any matrix except where
it thins out, nor were any small flakes present between
the large flint masses. This is a curious point, for, as
will be seen in fig. 3, soluble upper layers occur
in each case, that above the middle layer of flints
being a dense mass of clay filled with flakes. One would
have expected the clay and some of its contents to have
filtered down.

(5) Some clear proofs of disturbance by burrowing
animals in the layers of this pit affect the evidence afforded
by the presence of bones of domestic animals with imple-
ments in the different layers. In the upper band of flints,
SURFACE OF CRASS

SURFACE SOIL & LOAM

REDDISH SANDY GRAVEL

1st BAND OF FLINTS

UPPER CLAY LAYER

2nd BAND OF FLINTS

LOWER CLAY LAYER

CLAY & CHALK LAYER

3rd BAND OF FLINTS

APPARENT FLOOR OF SOLID CHALK 13 ft.

Contains flints and boulders from plateau gravel; a few flakes with edges knocked about.

Small pebbles of flint and quartz; no flakes.

No matrix; large subangular flints and boulders from plateau gravel; large chipped pieces and implements.

Large masses of chalk flints.

Workshop floor. Full of flakes and splinters with sharp edges.

No matrix; large chalk flints, raw material; several massive cores and anvils.

Limited band of charcoal; fragment of coarse pottery.

Some large chalk flints; few implements, flakes and cores and zone of shells (Pomatias and Helix nemoralis).

Very few flints; a few whitened flakes scattered through. Skeleton of dog, 11 ½ ft. Iron knife, 10¾ ft.

No matrix; large blocks of chalk flints; a few cores and flakes.

FIG. 3. SITE 1. TRANSVERSE SECTION THROUGH CENTRE OF PIT.

Nearly all the best implements came from layers e and d.

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SURFACE OF CRASS

SURFACE SOIL & LOAM

YELLOW CLAY LAYER

REDDISH CLAY LAYER

CHALKY DEBRIS

SOLID CHALK

Full of unchipped flints; one good implement at base.

Workshop floor: a dense layer of chipped pieces, mostly workshop debris, running down in pockets to the layer below.

Pockets of waterworn gravel; large chipped flints.

Unpatinated chipped flints; flint blocks up to 18 lbs.

FIG. 4. SITE 2. TRANSVERSE SECTION.
wedged in between them, were six or seven pieces of hand-made red brick or tile, and in the upper clay layer or workshop floor were some pieces of thick mediaeval glass. In the chalk and clay layer at a depth of 11½ feet was found the skeleton of a dog, about the size of an Irish terrier, which will be referred to later in describing the fauna. One may, however, note in passing that a badger 20 lbs. in weight could make a hole of such a depth, quite large enough for a dog of this size to pass down. In the same layer was an iron knife supposed to be of sixteenth-century date. This knife is six inches long with a blade one inch in breadth, and has a flattened tang 3½ inches in length terminating in a spherical bone pommel. The longitudinal section (fig. 2) shows that the thick bands of large flints did not reach the upper margin of the chalk shaft, and thus the soft layers below them could be penetrated from above without hindrance.

An apparent floor of chalk was reached at the depth of 13½ feet. Whether there is a deeper shaft as at Cissbury and Grime's Graves, where it sank to 39 feet with galleries radiating from its base, will, it is hoped, be ascertained by further excavation.

Fig. 4 shows a transverse section through site no. 2. The workshop floor here commences one foot below the present surface. Chipped debris exists all through the two clay layers, in some places without interruption, in others as two distinct floors connected at irregular intervals with each other. Pockets of pebbly gravel occurred in the reddish loam largely iron-stained. The larger chipped masses up to 18 lbs. in weight were found on the surface of the chalk, and in pockets reaching to a depth of 5 feet, embedded in pure red or white sand. It should be specially noted that no bones of domestic animals appeared on this site, the only animal remains being some red-deer horns, perhaps used by the miners as picks, which were found resting on the chalk.

It is possible that flint was carried from site no. 1 to be chipped on this spot, but the large chipped masses found in pockets here suggest that the flint was obtained from a surface mine. One large block from this site, with flakes removed from most of its surface, weighs 18 lbs. and in its original condition would have weighed much more.
Surface mining, to judge by the size of the reconstructed blocks, probably took place in palaeolithic times at Crayford and Caddington.

Fired flints have been found on both the Peppard sites. They are rare from site no. 2 and of small size. Site no. 1 yielded fired flints from each layer. Some of globular shape may have been used as pot-boilers. Other large fired flints below the charcoal layer were probably the remains of a hearth.

Both sites have yielded several cartloads of chipped material. As one would expect from a workshop floor, most are irregularly chipped pieces from which flakes have been struck, cores of various sizes, and blocks of new material. The waste irregular flakes run into many thousands, and amongst them are numbers of implements and "wasters," in all stages of manufacture, spoiled by flaws or ill-directed blows. A quantity of nearly finished implements show clearly the type of implement intended, and on a general survey of the whole this would appear to be the Drift type. The only implements referable to the so-called neolithic period are some similar to the Cissbury specimens, the date of which is called in question in a paper read by Mr. Reginald Smith before the Society of Antiquaries, and published in *Archaeologia*, lxiii. Some implements, practically finished, which can be matched with others from the river gravels, are shown in figs. 5, 8, 9, 12, 23 and 26. It seems incredible that these implements merely show different stages in the chipping of a neolithic celt.

The flint used on both sites is bad, mixed with chert, and full of pockets and crystals of calcite. The implements, when first taken out, are mostly dark blue in colour, but turn white as they dry. The patina is a very thin coating and varies with the composition of the flint from a dead white through various shades of blue. A peculiarity of the flint from site 2 is a black lustrous band of varying width beneath the crust, which does not change colour like the rest of the chipped surface. It is entirely absent in some specimens, but a few pieces from the upper clay layer of site 1 have the same peculiarity. A good many are covered with a deposit of carbonate of lime.

The colour is more variable on site 1, and in the
upper clay layer appear flakes entirely unpatinated, with others blue, or white, or mottled. The debris on site 2 in the lowest layer is generally unchanged, as are also the flakes and chipped masses in the dark band, at the base of the second layer of flints in site 1.

Iron-staining is present on both sites. Rare on site 2, it is found in all the layers of site 1, but to a larger extent in the loam and upper clay layers. It must be due to iron pyrites, as it is obvious that the plough never reached these layers. The occurrence of silicate gloss on implements from both sites (a feature in the Savernake specimens) is interesting because it is supposed to denote very great antiquity. This gloss is far more extensive on the specimens from site 1. It is seen in patches, specks, and detached lines, and is evenly distributed on the implements from all the layers, except the lowest, which I have only slightly investigated. An irregular piece of flint from the loam layer shows a large patch of it. This gloss was noticed on a leaf-blade at Grime’s Graves, and by General Pitt-Rivers on a crescent-shaped blade from Cissbury. It is present in small patches upon a fair proportion of the flakes from the latter site in my possession.

Out of the thousands of flints found at Peppard there is no sign of grinding or polishing, and in this the site differs from Cissbury and Grime’s Graves. Neither have I found any chipped arrow-heads, either complete or in course of manufacture, nor any worked borers. Several of the roughest chipped pieces bear unmistakable signs of use, so that the makers on this site must have been in a ruder state of culture than at either Cissbury or Grime’s Graves.

The various divisions of the neolithic period enunciated by Dr. Allen Sturje do not seem to include the Peppard implements. There are no ice scratches on any of the pieces from either site.

It is a curious fact that, except in the valley below the pit, I have not found any implements in the neighbourhood chipped out of the coarse flint used on the two sites. Mr. E. Payton and Miss Glassbrook have found a few flakes of the same quality at Hambleden, Bucks. With a view to establishing the date of these implements, I have made comparisons with the Cissbury collections
at Brighton, Manchester, Oxford, and at the British Museum, finding many points in common. Though there are several types which seem peculiar to Peppard, the following list seems to prove the close connexion of the two sites at Peppard with those of Cissbury and Grime’s Graves, Brandon.

1. Long narrow pick, Cissbury celt, fig. 28.
2. Thick circular plane with flat top and base, fig. 24.
3. Slug-shaped plane, fig. 16.
4. Single and double end-scrapers.
5. So-called end of celt.
6. Choppers.
8. Conical cores, resembling the grattoir Tarté.
9. Leaf-shaped blade.
10. Side-scrapers.
11. Pieces with partial surface work; and no doubt there are other similar pieces.

These identities bring us once more to the argument of Mr. Reginald Smith’s paper, already referred to, in which he suggests the removal of the Cissbury and Grime’s Graves culture to an earlier period than has hitherto been allowed. This theory receives additional support from several details noticed at Peppard, where the arguments he uses may be applied with equal force.

There is a striking resemblance to forms from Aurignac sites, especially that of Brassempouy, seven out of a group of nine implements figured from that site being matched from Peppard. With us they are on a larger scale, possibly accounted for by the abundance of raw material in large, coarse nodules.

In order to emphasise the point, I have made a list of some of the prominent forms which show a resemblance.

1. Various forms of steep-edged grattoirs, semi-oval and nucleiform, including the complete Tarté cone.
2. Long plane with steep side and end fluting.
3. Dolphin-shaped implement.

1 Piette, L’art pendant l’âge du renne, p. 46.
5. Nosed implements.
6. Choppers.
8. End-scrapers made out of long flakes. According to Dr. Allen Sturge this type "almost certainly" belongs to the Cave period.¹
9. Double end and crescent scrapers.
10. Partial surface work.

It would seem, therefore, from the evidence so far collected, that these sites at Peppard may have been a local development of the Aurignac culture.

**Fig. 5. Hand-axe of Drift type, site I. Front and back views (1/4).**

I shall now describe some of the implements, pointing out a few comparisons with other well-known types from different sites.

**Description of the Implements.**

Fig. 5. A well-shaped symmetrical implement from site 1, ridged on one face and well chipped on the other. It measures 4½ by 3½ inches, and is a pointed circular tool of Drift form. One almost identical in form but more

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roughly chipped came from site no. 2. This type is figured from Santon Downham in Evans' *Stone Implements*, fig. 435. An implement of similar shape from the gravel at Grovelands is in the Reading Museum.

An implement from site 2, measuring 2\(\frac{1}{2}\) by 2\(\frac{1}{2}\) inch, is a pointed oval, flattened on the unworked face, which shows two bulbs of percussion. The other face is conical but the apex of the cone is nearer the broad end. The flakes are removed from this surface from the margin to the apex. It is patinated white.

Fig. 6. A large segmental implement with flat base, wavy edge, and all the work on one face. The face is 4\(\frac{1}{2}\) by 4\(\frac{1}{2}\) inches and the base nearly 2\(\frac{1}{4}\) inches thick. It seems designed for a chopper and is similar to some from Grime's...
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Graves. This form is compared by Dr. Allen Sturge to a tea-cosy. Numbers of these forms came from site 1, but few from site 2.

Fig. 7. A large chopper with a thick crusted back and wavy cutting edge chipped on both faces, 6½ by 4½ inches and 2¼ inches thick. This is a common type at Cissbury and Grime’s Graves, and is suggestive of the Moustier cave-period. A specimen from the gravel at Barton
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Cliff, Hants. and another from Stoke Newington are in the British Museum. Numbers of these tools come from both sites at Peppard, and smaller choppers of this type occur also with a better finished edge. One from site 2 measures 3½ by 2¼ inches. It is flattened, with a thick back, the crust of which is partly chipped away. Both faces are worked and the margin is finished off with finer secondary work. It is patinated white.

Related to these are three implements of almost identical form from site 2. They are small choppers with natural handles. The best shaped one measures 2½ inches in length. The handle is long and rounded, with crust retained. The chopper end is broader and flattened, and chipped on both faces to form an edge.

Fig. 8. An ovate implement chipped on both faces, 4½ by 3½ inches. A type from both sites. Several chipped only on one face with a plain fracture and flaw of crystals come from both sites. This is a regular Drift form. Almost identical implements are in Reading Museum from Savernake and the Thames gravels.

Fig. 9. A long flat broad celt from site 1, 6 by 3½ inches, with bluish-white patination and iron-staining. It is a Drift type, and is matched by one from Shrub Hill and another from Northfleet in the British Museum. This type does not occur on site 2. A similar one from Cissbury, patinated white, is in the Pitt-Rivers

Museum, Oxford. Another from site 1 has the butt unfinished but is otherwise similar.

A number of pointed implements of tongue shape, with thick crusted butts, come from both sites. The most complete is a regular Drift “hand-axe” from site 2. One face is complete but the other proved intractable and is unfinished. It is 4 inches long, whitened and stained with manganese, as are a large number of pieces from both sites.

Long massive implements are not common on either site. One from site 1, 6½ inches in length, resembles fig. 440 from Gravel Hill, Brandon, in Evans' Stone Implements. It is a pointed oval, with one end a good deal battered. One face is ridged, the other boldly shaped by the removal of broad short flakes.

Another form from site 2 is made from a long rolled nodule, unlike any other piece. It is chipped on both faces for about one third of its length. It measures 6½ inches. The worked surface is slightly lustrous, iron-stained and unpatinated. It resembles a Strepy dagger, and is not unlike one from Swanscombe, in the Manchester Museum.

Each site has furnished a good example of the long massive rough celt which in the river gravels foreshadows the neolithic axe.

The specimen from site 1 is 7½ inches long and bears
a probably unintentional resemblance to the human form. I have seen several parallels to this implement. It resembles one from Icklingham.\(^1\) There are in the British Museum two from the gravel at Farnham, and one each from three other sites, namely, Wanstead, Shrub Hill, and Wangford, Suffolk. Dr. Plowright\(^2\) has figured a similar one from Massingham Heath, Norfolk, a site which has several points of resemblance to Peppard. In the Manchester Museum are several implements of basalt found by Mr. W. J. Knowles at Cushendall, Co. Antrim, which are clearly related.

The specimen from site 2 measures 6½ inches. It is

![Fig. 10. Implement with waist, site 1. Front and side views (1/4).](image)

flattened on one face, humped on the other, and has rounded blunt ends, and a sharp wavy cutting edge all round the margin.

Fig. 10. A symmetrically chipped implement of the "waisted" type from site 1, with a broad tang possibly for use with a handle. It measures 4 inches and is 3½ inches broad. One face is flat, the other symmetrically ridged. The left margin is squared with secondary work. Several rough examples of waisted implements come from site 2. One from this site of the same size as the one figured has

\(^1\) Evans, Stone Implements, fig. 422.

naturally crusted sides with an expanded end chipped up the face. This type occurs at Cissbury, and an example is in the Brighton Museum. One from the surface is in Reading Museum, and others from Stourpaine, Dorset, are in the British Museum and at Manchester. Mr. Reginald Smith, in the paper cited, has traced its connexion with Cave specimens.

Fig. 11. A nosed implement suggestive of the Aurignac cave-period, $4\frac{4}{5}$ by $3\frac{7}{8}$ inches. It bears a distinct resemblance to fig. 115 (2 and 7) in Sollas’ *Ancient Hunters*, from the Aurignac station of La Coumba del Bouïtou (Corrèze). This is the only example from site 1, but a series from site 2 show the fluted nose widening out, with the fluting extending to the sides until the complete steep-sided plane is reached, to which reference will be made later.

Fig. 12. A massive hand-axe, 5 inches long and 4 inches broad, chipped on both faces, the under one flattened. About fifteen rough examples of this shape come from site 1, and one only from site 2.

Fig. 13, related to the last, is a hand-axe, with most of the crust retained on one face, $4\frac{4}{5}$ by 3 inches. The
under-surface is flattened and shows a bulb-cavity at the butt-end. The side and end show primary and secondary flaking. It is of greyish, lustrous flint, not patinated blue or white like most of the other pieces.
It seems related to Prof. Sollas' fig. 115 (6), from the Aurignac site of La Coumba del Bouitou.

An interesting form of hand-axe which occurs on both sites is one with a twist characteristic of the Saint-Acheul type. A good specimen from each site has occurred and several rough examples. This clearly shows that an essentially Drift form was made at Peppard. They measure 3\(\frac{1}{4}\) inches in length and 2\(\frac{1}{2}\) inches in breadth. In each case the curve is an S, and not reversed as is usual.

The specimen from site 2 is made of a cherty flint, bluish-white, with the edges as sharp as when first chipped. The one from the upper band of flints, site 1, is more lustrous and of a deeper blue colour, with some iron-staining.

These implements are thicker than those from the Drift, and the same form occurs at Grime's Graves. A fine specimen with one face flatter than the Peppard examples, made from the excellent flint used at that site, is in the British Museum. I have a thinner implement of the same form and size from Rotherfield Greys, Oxon. which I found on the surface. It is patinated a creamy white. A smaller hand-axe from site 2 measures 3 by 2 inches.

**Fig. 14.** A core-shaped flint, with flat base and rounded top with a patch of crust. It is symmetrically chipped from base to crown all round the circumference, and measures 2\(\frac{1}{4}\) by 2\(\frac{1}{2}\) inches, and 3\(\frac{1}{2}\) inches in height. Some examples have a chipped ridged top. Few of these flat-topped cones have come from site 1, but many examples from site 2. In some cases one side is left rough. Some examples from site 2 are oval or square: one has been used as a hammer. What I take to be the true cores of the industry, of which fully five hundred have
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turned up in each site, are irregular pieces of various sizes from which flakes have been removed wherever a suitable plane of percussion has presented itself. A paper on the subject of flint cores as implements was read by Dr. Gillespie before the Anthropological Institute in 1876.

Fig. 15. A large thick flat flake 4\(\frac{1}{4}\) by 3\(\frac{3}{4}\) inch, with longitudinal chipping confined to the upper face, the edges battered, and end squared. The bulb of percussion is large, as shown in the figure, and the plane of percussion flat and not chipped away, as in the Northfleet flakes of the Moustier cave-period to which it otherwise bears a resemblance. It is the only piece of this form from site 1, though larger unsymmetrical flakes are common. It is related to the implement shown in fig. 26.

Fig. 16. No other implement of precisely the same shape as this has come from either site, although the examples mentioned below probably belong to the same type. It is a flint plane of slug form from site 1, 4\(\frac{3}{4}\) by 2\(\frac{3}{4}\) inches, of pure white patination. The base is nearly flat, and the bulb chipped away. The figure shows the little nose left at the broader end, which is also seen in a conical core from this site and two end-scrappers from site 2.
Several implements apparently of Aurignac type from the surface at Hambleden, Bucks, found by Mr. E. Payton and Miss Glassbrook, show the same characteristic. Another long implement from the same site, but patinated only a faint blue colour, measures 5½ inches, and may be another example. The whole of one side and the rounded ends of this implement are fluted, the left side being left rough. The base is nearly flat, with a patch of crust in the centre. An implement from Cissbury similar to the one figured is in the British Museum, and another from the gravel at Canterbury (red and lustrous) is in the same collection. Mr. Reginald Smith has pointed out the relation between this form and the Aurignac planes from Les Eyzies.

This form is represented on site 2 at Peppard by three implements. The more symmetrical one measures 4½ by 2½ inches. It is formed of a long flake, crusted and cupped along its upper surface. The under face is unworked except where the bulb is entirely chipped away. The end is rounded (squared in another specimen) and the sides are neatly fluted, so that it bears a close resemblance to the plane figured by Piette in L’Anthropologie, 1898, p. 538, from the Aurignac site of Brassempouy. An implement from Cissbury similar to this is in the Manchester Museum. Another in the same collection, almost identical, comes from a floor at Blackstone Edge, Pennine Ridge.

Fig. 17. A small segmental implement of "tea-cosy" form, 2½ by 2½ inches, with flat base and both faces chipped to form a wavy edge. A thinner one from the same site is similar to an implement from Cissbury in the Manchester Museum, and helps to connect the
two sites. The specimen figured has not the hinge fracture, seen in one from the Coombe-rock of Northfleet found by Mr. H. Dewey of H.M. Geological Survey, and now in the British Museum; but some of the specimens have the base chipped or left with patches of

crust, showing they are complete tools in themselves and not necessarily broken. This form helps to connect the Peppard sites with Grime's Graves, Brandon. A few examples of the "end of celt" have come from site 1, but none from site 2. The best is 4½ by 2½ inches and 1½ inches thick, flattened and chipped on both faces.
Fig. 18. This is a unique implement from site I, bearing a resemblance to a dolphin. It measures $4\frac{3}{4}$ by $2\frac{3}{4}$ inches and is $2\frac{3}{8}$ inches thick. A similar form is figured in *L'Anthropologie*, 1898, by Piette, from the cave of Brassempouy.

Fig. 19. An adze-like tool with long rough tapering handle. It measures $5\frac{1}{2}$ inches in length and $2\frac{8}{8}$ inches across the semicircular end. The broad end is bevelled by chipping and finished off by finer secondary work. The under face is concave, and the narrow end is untouched. It is patinated white and has patches of silicate glaze, to which I shall refer later. It came from the upper clay layer of site I (the workshop floor) and shows more finish than any other piece. A rougher example with a broader handle came from the same site, bearing a resemblance to one from the surface near Grime’s Graves, in the British Museum. In the same collection are a number of smaller size and with wider handles from Cissbury, but I have seen none quite the same. The nearest approach is a basalt implement, $6\frac{3}{4}$ by 3 inches,
in the museum at Manchester, found by Mr. W. J. Knowles, at Cushendall, Ireland.

Two implements from site 2, flattened, with rounded ends, are interesting, as they maintain the general Drift character of the pieces from the two Peppard sites. The first measures 3½ by 2 inches, of whitened cherty flint iron-stained. The sides are parallel: one thick and unworked, the other with secondary work on both faces to form a slightly wavy edge, more finished on the rounded narrower end. It is cupped on one face and shows partial surface work on the other. There is a parallel piece to this from Cissbury in the museum at Manchester. The second piece is 3 by 2½ inches, shoe-shaped, with a flattened and a convex face, made out of a cherty piece of flint. The sides are parallel and one end is rounded by secondary work. The flat face is untouched, and the convex one retains patches of crystals, showing that the workers on this site did not select only the best material but utilised pieces with flaws if the shape suited their purpose.

Two other pieces bring out this point, and show that on this site a high degree of finish was not always aimed at. One is a large, broad, irregular flake, which shows fine work or signs of use along one edge but is otherwise untrimmed. The other is an irregular piece, with an uneven under-surface through which projects a rough ridge of chert, showing signs of use along the sharp flaked edge. These four implements show that many of the roughest pieces with one good cutting edge are complete tools in themselves.

Fig. 20. A broken leaf-shaped blade 3¼ by 2½ inches, skilfully chipped on both faces, with a blunt point and a curved and wavy margin. It came from the junction of the loam and upper clay near the upper margin of the pit (site 1). It is thicker than a true Solutré blade and, if an Aurignac date is adopted for these sites, may represent the dawn of the Solutré period.

Another pointed blade from this site, 2 by 2½ inches and 1 inch thick, has a hinge fracture at the base. It is chipped on both faces, with one margin straight, the other wavy. It resembles a lanceolate weapon from Laugerie Haute, fig. 1, pl. xlia, in Lartet and Christy's Reliquiae Aquitanicae.
An interesting piece comes from site 2 which may be a parallel to fig. 20. It is $3 \frac{3}{4}$ by $1 \frac{1}{2}$ inches, made from a long external flake of coarse-grained flint, one side of which is broken away. The whole of the bulb face is somewhat roughly worked. The sides and ends of the external face are flaked, leaving a patch of crust in the centre. In places it is patinated a deep white of a bluish tinge, and the work is clearly not by the same hand as the piece figured.

Closely related to the last and chipped in the same style are some thirteen implements all showing fine secondary work patinated white like the primary flaking. They range from $3 \frac{1}{4}$ to $2 \frac{3}{4}$ inches in length and $2 \frac{1}{4}$ to $1 \frac{1}{2}$ inches in breadth. They are all made of external flakes and retain the crust completely or in small patches, having the flat face wholly or partially flaked, with the bulb chipped away. Two come from the upper clay of site 1, the rest from site 2. They may be scrapers or knives.

One is a fine piece of work made out of a symmetrical leaf-shaped flake ($3 \frac{3}{4}$ by $2 \frac{1}{4}$ inches). The bulb is chipped away to form a straight sharp knife-like edge extending...
along the margin of the flake, and there is partial surface-
work on the other side. A knife of this form was found by
Captain Wade in a mine on Stokesdown Common,
Chichester, and is now in the Brighton Museum.

One of this series is entirely flaked on the convex
surface, and partly on the flatter face, the bulb being
retained at the side. It is thicker than the rest. In
shape it seems to be a degenerate hand-axe.

Another implement from site 1 agrees in form and
size with some of this series. It is of a more finely grained
flint, dark and lustrous, and consequently has finer flaking.
A patch of crust is retained on the flatter face. From
its sharp edge it seems to be a knife. A number of flakes
worked into knives were found by Mr. Allen Brown on
the palaeolithic floor at Creffield Road, Acton.

Fig. 21. An oval implement
from site 1, measuring 2 1/4 by 1 5/8
inches, cupped beneath and with
crust above, showing steep and regular
fluting in the Aurignac manner. It
would serve as a scraper.

Considering the enormous mass
of chipped material from both sites,
finished scrapers are not common. Of
flakes of suitable size and shape
quantities have occurred, and it is
possible many of these flakes represent the factory
stage of the scraper. A number of large end-scrapers,
4 by 3 inches, made from flakes, come from site 1. This
form is rare on site 2. One large example, 4 1/2 inches in
length, entirely unpatinated, from the latter site was
lying on the chalk, 4 feet from the surface, with three
antlers of the red deer. A rare form resembling one
from High Lodge, Mildenhall, has good secondary work
up the face. It is made out of a broken nodule and is
patinated a pure white with lustre.

Only two finished scrapers of the straight-sided horse-
shoe type common on the surface have occurred, one from
each site. The specimen from site 1, 2 1/2 by 2 1/4 inches, is
bluish-white with a good ogee curve and the bulb partly
chipped away. The sides and end show fine work which
may be the result of use. The specimen from site 2 is
longer (2½ by 2½ inches) of dark lustrous flint with a bluish tint and a line of blacker material beneath the patch of crust near the scraping edge. It has secondary work up the rounded margin. Although similar to neolithic scrapers, small implements of this shape were abundant on the palaeolithic floor at Stoke Newington. Mr. Worthington G. Smith says “before the time of the deposition of the contorted drift of Caddington, man had already designed, not only the pointed and ovate stone implement, but the flat oval knife and the small scraper, the latter tool being so finely and neatly made as not to be distinguished from the best neolithic work.” A similar one from the Somme gravels is figured in Lartet and Christy’s Reliquiae Aquitanicae, p. 14.

About a dozen examples, rather rough, of long end-scrapers, with thick handles and steep chipping, came from both sites. Three good examples of double end-scrapers came from site 1.

Of the rarer forms of scrapers are two chipped with a tang to fit into a handle. One of these from site 1, 2½ inches in length, is narrow and made out of an external flake. The sides and rounded end show signs of use, and are patinated bluish-white like the rest of the surface of the flake. The other from site 2 is 1¼ inches in length. It is formed of a round-ended flat flake with a pronounced ogee curve. The tang is chipped at the sides, and the thickness of the bulb reduced by work on its upper face. At first sight it looks like an attempt to make an arrow-head. There is, however, a rim of crust round the margin with clear signs of use both at the end and sides. It is unpatinated, of dark lustrous flint.

A unique form of scraper from site 2 is made from a thick external flake, 3½ by 2½ inches. It has been chipped at the end to form a projecting central nose. Another of the same size from the same site has steep end-chipping with a little projection left at the right corner, to which reference has previously been made.

A well-chipped implement, probably a form of scraper, from the same site is ear-shaped, with a flat base and the bulb entirely chipped away. It shows secondary work

1 Man, the primeval Savage, p. 173.
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all round the margin, with engrailing between the bulbar cavities.

An unusual method of forming the upper surface is seen in a scraper from site 2 made from a broad flat flake. The flaking of the upper surface is done from the side. The end shows a hinge fracture, part of which is destroyed by fine secondary work.

One long narrow flake has the end rounded with secondary work like the scrapers from Madeleine sites. Another, a broad, long thick flake, has a good crescent chipped at the end. Crescent scrapers are very rare on site 1 and do not occur on site 2.

A group of scrapers represented at Grime's Graves occurred on both sites at Peppard. They are made from thick, massive short flakes, chipped up the sides and end, and form a series quite distinct from the heavy blocks with vertical fluting, which also seem designed for the same purpose.

Fig. 22. A conical flint from site 1, 2 1⁄2 by 3 inches by 2 inches high, with secondary work, which bears a resemblance to the grattoir Tarté of Aurignac sites. It has a flat base, and is chipped from the margin to form a cone except at the back, which is left rough. A similar form from site 2 is shown in fig. 27.

A number of these planes come from each site. They are quite distinct from the cores with chipped, irregular bases.

The conical planes from the Peppard sites resemble
the nucleiform grattoir figured by Piette from Brassemoupy (L’Anthropologie, 1898, p. 537), and those figured by Lartet and Christy, Reliquiae Aquitanicae, pl. 1A (4 and 5).

Fig. 23. A thick disc from site 2 of regular Drift form, 3 inches in diameter, 1½ inches thick, bevelled by chipping on both faces to form a sharp wavy cutting edge all round the circumference. Another partly finished comes from the same site. This form is found at Grovelands near Reading, in the river gravels. A similar one from Barton Cliff, Hants. is in the British Museum, and another from Northfleet in the Natural History Museum. It also occurs at Santon Downham.

Both of the Peppard sites have yielded numbers of implements of the disc type, intended, according to Sir J. Evans, for use with a sling stick, for which purpose the Peppard examples are too large and heavy. Few are quite circular. Many have one part of the edge bevelled as if for scraping. In size they vary from 3 to 4½ inches in diameter. A flattened example found in the upper clay (site 1) by Mr. E. Payton, is chipped on both faces, with squared sides, one of which is finely worked for scraping. It measures 10½ inches in circumference. One of this type from site 2 resembles a scraper of Chelles type, figured by Prof. Sollas in Ancient Hunters. A fine example from site 1 is 4½ inches in diameter, roughly triangular in shape, with a projecting beak. It is skilfully chipped on both faces by the removal of large broad flakes.
An unusually thin implement of this class is ⅝-inch in thickness, with some crust retained on one face. The margin is regular and sharp. It seems designed for a knife.

The nearest approach to these thick disc-shaped implements I have seen are in the Brighton Museum. One measuring 5 by 4 inches is bluish and iron-stained. It came from the surface at Redhill with a number of implements of Aurignac type, including the Tarté cone. The other, 3 by 2½ inches, white, cherty and iron-stained, came from Hollingbury Copse, Brighton. This form is represented at Grime’s Graves by two examples in the British Museum.

Some of the flat circular forms from Peppard resemble the pieces from which flint armlets were chipped in Egypt.

Fig. 24. A steep, cliff-faced circular plane, with a sharp frilled margin from site 2, 4¾ by 3½ inches, and 2½ inches thick. The upper and under surfaces are cupped, the former showing a large bulbar cavity. One part of the circumference is left untouched. Several rough examples come from each site. This type is found at Cissbury. It occurs at the Aurignac cave, and specimens from Les Eyzies and other cave sites are in the British Museum.
Museum. The work is not from above as in the tortoise cores left on certain Moustier sites.

Fig. 25. A flat triangular implement from site 2, 3\(\frac{1}{2}\) by 3\(\frac{1}{4}\) inches. It is well chipped on both faces, and has a wavy cutting edge at the broad end and white patina.

![Fig. 25. Triangular Implement with Cutting Edge at Broad End, Site 2 (\(\frac{1}{4}\)).](image)

Fig 26. An oval thin implement from site 2, resembling one from Northfleet of the Moustier period, 3\(\frac{3}{4}\) by 2\(\frac{3}{4}\) inches. It is made from a long flake. The bulb is chipped away. The primary work is mostly on the upper face, with secondary work at the ends and along one side.

![Fig. 26. Implement from Site 2 Resembling Some from Northfleet, Back and Front Views and Section (\(\frac{1}{4}\)).](image)
WITH SOME NEW TYPES OF FLINTS.

Fig. 27. A conical flint from site 2, resembling the Tarté plane of the Aurignac period. The nearly flat base is chipped into shape. The conical top has a small patch of crust in the centre. The edge is battered in one part.

Fig. 28. A typical Cissbury celt found on site 2, 2½ feet from the surface, in a pocket of chipped debris in the red clay layer: 1½ inches broad, 1½ inches thick, and 5½ inches long, patinated bluish-white with the edges sharp. One surface is not quite finished, as the material proved intractable. The curve of the implement is probably due to the coarse quality of flint used.

An implement similar to this is figured in the paper previously quoted from the cave of Brassempouy. Another implement like a Cissbury celt, thicker and more roughly shaped, came from the same site, and a third chipped
in the Cissbury manner seems intended for hafting. It has a sharp rounded overhanging edge and may be a scraper.

One of the roughest pieces from site 2 is a chisel, 4\(\frac{1}{2}\) by 1\(\frac{3}{4}\) inches. It is formed from a very irregularly crusted, elongated nodule. The handle is untouched. The squared cutting edge is chipped on both faces. Another form, which appears to be a chisel, from site 2 is made from a long symmetrical double-ridged flake, 3\(\frac{3}{4}\) inches in length. The sharp squared end shows signs of use, patinated bluish white like the rest of the flake. It resembles a rare form from the Dordogne caves, one of which was found at Les Eyzies, and another at Gorge d'Enfer.

A number of wedge-shaped implements come from both sites at Peppard. They seem complete tools in themselves, and fall into different groups. A patch of crust is retained for the hand to grasp. The smallest are about the size of a large plum.

A series of pear-shaped implements form another group chipped on both faces, one nearly flat, the other ridged. A well-chipped implement of wedge shape, with a blunt nose, resembles one from the gravel at Wheat-hampstead (Evans, fig. 455a).

One of the best chipped pieces is nearly circular and flattened, with a sharp edge. It is of black lustrous flint unlike that mined on the spot. It came from the loam above the "floor" on site 2, and may be of later date. In form it resembles a Mousterian implement, fig. 4, plate xii in Reliquiae Aquitanicae. A unique piece from site 1 appears to be an early form of graver. It is a flat, double-ridged flake, 2\(\frac{1}{4}\) inches long. The edges are worked, the point curved to one side and chipped to a rounded keel.

From both sites come a number of implements, symmetrically chipped and apparently finished on one face, but untouched on the other. The unchipped face usually has a plain fracture, disclosing a flaw of crystals, slightly or entirely patinated. The untouched face has, however, at the margin served as the plane of percussion for the work on the other side. That many of these rough pieces with a good edge are complete tools has already been contended. Several of these implements are similar in form
WITH SOME NEW TYPES OF FLINTS.

...to the oval Drift type, fig. 8. A rare piece of this description, 4½ by 3½ inches, resembles a horse's hoof in shape. The worked face has a crescentic ridge, with bold and skilful work running to the margins. That the unpatinated side is not a more recent fracture, and that the piece is consequently not an implement split by frost, is clear by comparison with two broken celts found at Cissbury in 1892 by Mr. H. Willett and Professor Boyd Dawkins, one of which is at Brighton and the other at Manchester. The two broken pieces in each case are whitened on one face and black on the other. When united the white face of one is found to correspond to the black face of the other, although the work is of one date. A series in the British Museum from the Nile valley shows the same thing.

As one would expect from factory sites, both have yielded a number of hammers or pounders. These are of various shapes and sizes: 37 came from site 1, 25 from site 2, but their number is probably greater. Of those from site 1, five are water-worn pebbles of quartzite, five of quartz, four are cores, and six are crusted flint nodules, some of which are ball-shaped, similar to numbers I have from the surface in this neighbourhood and from Hambleden, Bucks. One much-used hammer is a water-worn boulder of an igneous rock. About 12 large rounded flint nodules, weighing 4½ lbs. and battered all over, may be anvils. A similar anvil from Swanscombe is in the museum at Manchester.

Of the hammers from site 2 most are of quartzite. The ball-shaped flint hammers are also found, one of which weighs 2½ lbs. It corresponds with a specimen from Swanscombe at Manchester, and another, in Reading Museum, from the surface. These battered flint balls are not necessarily neolithic, but seem to range from palaeolithic times, certainly to the Bronze Age and perhaps later, and consequently do not help to date the implements. Numbers came from Grovehurst and White Park Bay. That they were occasionally polished is seen from two rare specimens at Brighton Museum, found in that neighbourhood by Mr. H. S. Toms and Mr. Garraway Rice.

Quartzite examples and cores used as hammers come...
from the caves. Two water-worn Eocene pebbles, battered at the end, come from site 2. The most interesting is a quartzite pebble probably derived from the plateau gravel, 4 ½ by 3 ½ inches, with a thickness of 2¼ inches. One end is rounded and battered by use, the other is broader, and chipped on both faces to form a wavy cutting-edge.

The flakes from both sites vary from small, sharp, long needles to massive pieces 6 inches long, and from 3½ to 3¾ inches broad. They are comparatively broad, but this is probably due to the quality of the flint. Long, narrow symmetrical flakes are rare, possibly because they were carried away for use. Very few show signs of use.

In comparing the implements taken from the different layers, I have been unable to find any differences in form, and presume that all the chipped pieces belong to the same period.

FAUNA OF THE SITES.

For the identification of the bones I am indebted to Dr. Andrews and Mr. A. H. Cocks, F.Z.S. F.S.A.

The fauna of site no. 1 includes the bones of domestic animals, viz: sheep (*Ovis aries*) or goat (*Capra hircus*), ox (*Bos domesticus*), pig (*Sus scrofa*), and horse (*Equus caballus*); also red deer (*Cervus elaphus*), a passerine bird, rabbit (*Lepus cuniculus*), and frog (*Rana temporaria*); also possibly *Celtic shorthorn* (*Bos longifrons*).

The following bones occurred in the different layers:

Loam layer: incisor of ox.

First flint layer: lower jaw of sheep or goat, probably the latter; calcaneum of pig; olecranon and part of shaft of long bone of ox.

Upper clay layer: rib of ox or horse; lower end of humerus of small sheep or goat; part of horn of red deer; rabbit.

Second band of flints: lower end of femur of ox.

Second clay layer: horn of red deer; rabbit.

Clay and chalk layer: skeleton of dog; lower jaw of ox; metapodral of small sheep; calcaneum of pig;
incisor of small horse; rabbit; frog; passerine bird; and some others not identified.

The fauna of site 2 consist of shed antlers of red deer, but no bones.

Mr. Cocks has made a detailed comparison of some of the bones. The red deer antler from the upper clay layer (site 1) is larger than that of a fine modern stag, but smaller than a horn found when widening Magdalen bridge, Oxford, and much smaller than many examples of Roman date found at Hambleden, Bucks. in 1912.

Lower jaw of ox: the ramus agrees in depth with a modern heifer, 2½ years old, as far as the tooth row extends. Anteriorly the Peppard jaw is rather shallower, and from the alveolus of the first premolar to the mental foramen it is ¼ inch longer than the modern bone. The teeth are smaller than in the modern example. The living animal appears to have been rather light-boned, bigger if anything than the Jersey breed, and certainly not quite small like the ancient Celtic ox misnamed Bos longifrons.

The lower jaw of sheep or goat agrees with a modern Oxford Down animal: from the small size of the teeth it was probably a goat. From its large size it can hardly be ancient, or older than some two centuries at most.

The dog's skeleton is rather smaller than a pure-bred Lapland dog, and therefore about the size of a large Irish terrier. The skull is very thin and decidedly smaller than the Lapland breed. In length and substance the long bones are slighter, and the Peppard dog would be of different proportions.

The fauna at Peppard agrees with that of Grime's Graves, but at Cissbury we have in addition the urus, roe-deer, and otter.

It should be noticed that in the clay and chalk layer remains of the sheep or goat and horse are of small animals. The horse occurs at La Micoque, and was used as food in Aurignac and Solutre times. Bones of goat have been found by M. Dupont in Belgian caves, and also by Mr. R. H. Tiddeman in the Victoria cave, Settle, Yorks. associated with elephant, bear, and hyaena, 15 feet deep in a stiff clay.

The skeleton of the dog, though probably more recent, does not necessarily date the implements as neolithic, as
a deposit of Moustier age has yielded remains of this animal at Châteaudouble, Var.

Certain shells occurred in the different layers of site 1. They belong to recent species, and Mr. B. B. Woodward, who kindly identified them, suggests that the deposits are due to rainwash. The following is a list of the species and the layers in which they were found:

- *Helix aspersa*: first, second, and third flint layers, and clay and chalk.
- *Helix nemoralis*: lower clay, clay and chalk, and third flint layers.
- *Pomatias elegans* (Müll.): in the lower clay layer as a definite zone.
- *Vitrea tritidula*: in all the layers from the first flints downwards.
- *Clausilia laminaria*: clay and chalk layer.
- *Helix lapicida*: clay and chalk layer.
- *Ena obscura*: clay and chalk layer.
- *Coccilioides acicula*: clay and chalk layer.

The only shells from site 2 were *Vitrea tritidula* and *Helix nemoralis*.

Roots of alder in the upper clay layer formed a definite zone in the lower part of the deposit. Branches and roots of oak came from the second band of flints, and casts of beech mast and a globular berry, the latter not identified, occurred in the lower clay layer. At a distance of 8 feet from the surface in the layer of charcoal at the base of the second band of flints, I found a piece of coarse plain pottery. It is very small, about ½ inch in diameter, and may be a later introduction. Pottery has been found, however, in twelve palaeolithic caves in Belgium by M. Dupont, and at an Aurignac site near Roisen, Hainault.

In conclusion I must tender my sincere thanks to Mr. Reginald Smith for valuable assistance in this paper, and in many other ways. Also to Mr. William Hamilton, of Henley-on-Thames, who kindly permitted me to excavate the sites; to Mr. E. Payton for much help in arranging and classifying the implements; and to Miss K. Ames for assistance in compiling the notes for this paper.