THE IMPLEMENTS AND CORES OF CRAYFORD.

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The well-known brick-earth deposits of Crayford, in Kent (forming part of the so-called 50-ft., or middle terrace of the Thames), have for many years yielded flint implements of Mousterian type, and more recently (1910-12) I have succeeded in finding the cores from which such implements were struck.

In the closing decades of the last century long, slender knives of fine quality flint were abundant, but since the writer first came to have the pits under observation (in 1903) implements of all kinds have been rare, and many winters go by with only the discovery of a few simple flakes.

References up till 1889 are given in the "Geology of London,"* and, in 1905, Messrs. Hinton and Kennard brought them up to date in their paper on "The Relative Ages of the Stone Implements of the Lower Thames Valley."† This valuable paper was the first to attribute the characteristic Crayford implement to the Mousterian period, on account of the similarity in workmanship to those from Le Moustier. Messrs. Hinton and Kennard credited Mr. Worthington G. Smith with having made this discovery, but according to Mr. Reginald A. Smith‡ this is not correct. Therefore, the credit belongs to Messrs. Hinton and Kennard themselves. The classification adopted in "The Relative Ages of the Stone Implements of the Lower Thames Valley" has since been substantially confirmed and accepted, but this pioneer work is frequently ignored.

More recently the Geologists' Association has made several excursions to the Crayford district, reports of which have appeared in their "Proceedings," together with diagrams and photographs of the sections.¶ In 1913 I was fortunate enough to find three flakes which fitted together, and also nine pieces belonging to the same nodule, but none of which actually fitted owing to the absence of some intervening pieces. This proves the existence of a working floor here. The position was at the base of the lower brick-earth, *i.e.*, that below the *Corbicula Bed*§ (see

* "Memoirs of the Geol. Survey" (1889).

† "Proc. Geol. Assoc.," Vol. XIX., pp. 76—100 (1905).

‡ "Man," April, 1914, No. 31.

¶ "Proc. Geol. Assoc.," Vols. XIX., pp. 137—141 (1905); XXIII., pp. 183—190 (1912); XXV., pp. 61—71 (1914). For fauna see *ibid* Vols. XI., p. 335 (1890); XVII., p. 213 (1901); XX., p. 39 (1907); and XXI., p. 493 (1910); and "Geol. Mag., Dec. 3, Vol. VII., p. 452 (1890).

§ In explanation of the diagram shown in Fig. 33 (which was drawn originally for geological purposes, "Proc. Geol. Assoc.," Vol. XXV., pp. 61—71), it may be said that the 1st (or 100 ft.) Terrace of the Thames about reaches down to the top of the section at 85 ft. O.D.

Fig. 33.—Scale Diagram constructed from actual Sections in the Crayford Brick-earth and Gravel Pits (1913).—R. H. CHANDLER.
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Fig. 33), and between 25 and 30 feet O.D. This is very probably part of the working floor discovered by F. C. J. Spurrell in 1880,* as there is only half a mile between the two sites, and the position as regards level is about the same. It is interesting to note that these flakes are rough and unshapely, and have nothing characteristic of Le Moustier about them.† The set of flakes found by Spurrell do not suggest Le Moustier.

The cores illustrated here are, fortunately, not recognised by the workmen as showing any human workmanship, and are, therefore, left lying about the pits wherever they happen to have been found. The same applies to the fitted flakes. But when it comes to what they call, no doubt quite correctly, "knives," the case is different. An old workman assured me they could tell

Fig. 34.

when a "knife" was thrown against the gravel screen by the clear ringing sound it made against the metal. This was in the early days when these knives were abundant, and were being found on the top of the gravel at the base of the lower brick-earth. This agrees with the only two instances in which I have ever succeeded in finding flakes *in situ*.

* "Quart. Journ. Geol. Soc.," Vol. XXXVI., pp. 544-548 (1880).

† The same remarks apply to another set of contiguous flakes I was lucky enough to find in another deposit—i.e., a set of rough flakes shewing nothing to suggest the characteristic implements of that deposit (St. Acheul II. and Le Moustier). The deposit in which these contiguous flakes were found is by position and flint implement culture, between the 1st and the 2nd terraces. "Proc. Geol. Assoc.," Vol. XXIII., pp. 102-111 (1912). It is hoped at a future time to illustrate these two sets of flakes and to deal with the interesting points they suggest.

Mr. J. T. Brown, who was a resident at Crayford when these knives were plentiful, and knew the pits intimately, writes to me as follows:—"Years ago, I had fine opportunities of seeing them [the knives] *in situ*, when the men got to the bottom of the clay beds between Crayford and Erith; there you could see them lying as left by the makers before overlain with those immense layers of clay." The workmen will now tell you the flakes they find at the present time come from either the upper or the lower brick-earth, but this is probably due to faulty observation.

FIG. 34.—The first implement to call for notice was found by the writer in 1905, near the base of the lower brick-earth, in Rutter's Pit on the west of the main road. So far as can be learned,

Fig. 35.

it is the only implement found *in situ* for many years by anyone except the clay-workers. The implement is wider and shorter than the long knives found in the eighties, but the workmanship is typical. The specimen is made from mottled brown flint, quite unpatinated and, probably, slightly used (as the sharp edge has been blunted in places). Size 4 by 2'8 ins. 1. Exhibits the worked face with a small piece of cortex on the left. The cortex is olive green, shewing that the implement has been struck from one of the "Bull Head" flints.* 2. Bulb face, without any working, shewing

* Modern forgers, who are not fortunate enough to live near Brandon, frequently use "Bull Head" flint in preference to any other.

Fig. 36.

bulb curvature. 3. Facetted butt, prepared before striking the blow which severed the implement from the core; there are also many facets, probably made subsequently. 4. Section.

FIG. 35.—1. A very cleanly worked, thin and perfect implement of homogeneous black flint, unpatinated and unused. Size 5'3 by 2'1 ins. 2. Bulb face. 3. Facetted butt, shewing bulb curvature. 4. Section.

Fig. 37.

FIG. 36.—1. A rougher implement of grey, knotty flint, unpatinated and unused. Size 4'8 by 2'6 ins. Point missing. 2. Bulb face. 3. Facetted butt, shewing bulb curvature. 4. Section.

FIG. 37.—1. A roughly flaked implement of grey, knotty flint, slightly patinated on face, but considerably more so on the back (bulb face). Facetted on striking face. Size 3'6 by 3 ins. Not a characteristic specimen. 2. Bulb face. 3. Section.

Fig. 38.

FIG. 38.—1. Specimen between an implement and a core. The blow (which was struck at the upper end) has caused the flake to run deeply into the core, so that the implement is thicker at the lower end than at the bulbar end.* This is quite exceptional. Probably thrown on one side as a "waster," being too stout for a knife and too thin for a core. Formed of black and grey flint, marbled white and iron-stained on face, and with points of incipient patination on bulb face. Size 6'1 by 2'7 ins. 2. Bulb face. 3. Section.

* It is a "plunging" flake, but I consider such production, like "hinge" fracture, to be mostly accidental.

FIG. 39.—1. Flaked face of core shewing the hollows from which four complete flakes have been removed, and the truncated remains of several other flake scars. Dark grey, knotty flint, slightly patinated on face, and considerably more so on the undercut and flaked ends.* 2 and 3. Elevation of top and bottom ends to show

Fig. 39.

the manner in which the core has been undercut by the process known as rough facetting the butt. The feature is rather difficult to show by means of a pen-and-ink sketch, but perhaps the profiles taken through the centres of 2 and 3, and drawn beside them, will help to make it clear.

FIG. 40.—1. Core shewing hollows from which several flakes have been removed and many truncated flake scars. Dark grey,

* *Vide infra.*

Fig. 40.

Fig. 41.

knotty flint, upper face slightly patinated, but ends considerably more so. 2. Elevation of right-hand side of 1, shewing the dressing off of the ends; lower end dressed off square, but upper end is undercut as in Fig. 39.

FIG. 41.—1. This is in many respects the most remarkable core of the lot. It shows twelve bulb hollows, besides several truncated flake scars. It is undercut at both ends, and only two small scraps of cortex remain. The bottom is a thermal fracture. The flint is of brown colour with lighter knots and is unpatinated. 2. Section.

CONCLUSION.

From the foregoing illustrations it will be seen that the implements possess the following points in common:—1. All the flaking has been done on the face before removal from the core. 2. Bulb face perfectly unworked. 3. Facetted striking face. 4. And, to a certain extent, thinness is a feature.

The cores (six in number) are all of flint derived immediately from the chalk (except, perhaps, Fig. 41, which may be from "Bull Head" flint), and they agree in exhibiting the squaring, or undercutting of the ends, to enable the worker to get a clean blow. This, probably, accounts for a great part of the facetting of the butts of the implements, but I think these butts have also frequently been trimmed up after removal from the core.

As regards patination, the upper faces are not so patinated as the lower and undercut faces. It seems a curious series of accidents have combined to place the cores worked face downwards, so that any water percolating through the brick-earth produced more result on the upturned side, or that one composed of cortex and the undercut ends. Besides these unequally patinated cores there is one (not figured) dead white, and Fig. 41 is absolutely fresh.