

Suffolk Institute of Archæology and Natural History.

FLINT TOOLS SHOWING WELL-DEFINED FINGER-GRIPS.

BY NINA F. LAYARD, F.L.S.

The rapidly increasing interest lately shown in the works of men of the Stone Age, is probably due to the employment of a better method of introduction to the study, than has before obtained.

Up to recent years specialists in this particular branch of pre-historic archæology (with notable exceptions) were not sufficiently at pains to initiate the would-be learner into the first simple methods whereby human work, on flints and other stones, could be distinguished from fracture brought about by natural causes. The result was that an exhibition of flint implements was both meaningless and uninteresting to the majority of the general public. Visitors who for the first time found themselves contemplating such a collection, were often heard to remark, that "hundreds of similar flints had been seen by them in wanderings over the fields, but that they did not appear worth the trouble of picking up." A very simple demonstration on the spot by a curator or collector who knew his business, would in five minutes dispose of this error, and convince the student that flint implements are not so common, or so easily recognised as pebbles on the sea shore.

One of the objects of this paper is to suggest that tools specialized for the hand-grip as here illustrated, might be used with advantage for helping to impart this rudimentary knowledge.

Where, however, such highly differentiated forms as those under consideration cannot be obtained, the small thumb-scrapers which are so commonly found in East Anglia, and other flint districts, will serve the same purpose. These little implements, which were employed in large quantities by the pre-historic skin-dresser, are the first to attract the eye of the beginner, and much may be learnt from an examination of them.

The symmetrical outline—the flat striking platform—the bulb of percussion formed by the direct human blow on a homogeneous substance,* and the careful trimming of the sharp margin to produce a scraping rather than a cutting edge, to all these points attention may be drawn, and when once their meaning is grasped, the enquirer is fairly on the road to distinguish for himself the more obvious differences between artificial and natural work.

These scrapers, however, are only held between finger and thumb. It is another matter when in forming a handle, the delicate palm of the hand has to be considered in relation to the shaping of the implement.

Flint being a notoriously sharp and cutting material, the knapper of old times must have often suffered severely during his first experiments with it, and we find a variety of expedients made use of whereby to

* Dr. Hind informs me that the silica is in a gelatinous condition when it first collects round a nucleus. It appears that the elasticity is not lost by the flint, with the result that a bulb is formed when a direct blow is given to it.

insure immunity from this danger. This has resulted in tools so ingeniously fashioned to fit the hand, that to handle them means instantaneous conversion, first to the fact that an intelligent being did indeed manufacture them, and afterwards in many cases, to a recognition of the absorbing interest which hangs about the mysterious history of these early tool makers.

Out of a large mass of material collected from the ploughed fields of Norfolk and Suffolk, I have therefore selected some of the most striking of these particular forms, in order to draw attention to the use which might be made of them for educational purposes.*

* In this I am encouraged by the following letter written by Dr. Power, Professor of Archæology at University College, Cork, and forwarded to me by Professor Hartog. "The photos are really excellent, and the 'reconstructions' extremely happy. It seems to me that if reproduced as lantern transparencies or as illustration blocks for a book, these pictures would have a very considerable educational value. I am very pleased indeed to have seen the photos, etc."

From Sir Bertram Windle, F.R.S., President of University College, Cork, I also received the following:—

"Listarkin,
Union Hall, co. Cork.
June 30th, 1917.

Dear Madam,

As I am now in the country I have no copy of the letter which I sent to Professor Hartog, and indeed I greatly doubt if one was made. I told him that I greatly admired your excellent photographs and fully agreed with your conclusions. Some fifteen years ago when I was in Birmingham I issued an appeal for gifts for the Ethnological Museum which was in my charge. This elicited an offer from a clergyman whose name I have forgotten. He had been a missionary in Western America and had made a splendid collection of stone and other implements which he gave me for the University. When last I heard about him he was going to South Africa as a missionary. He told me that anyone acquainted with the ways of savage races could *always* tell how the implement was intended to be held by the finger grips devised by the maker and he demonstrated this to me on many of the things collected by himself. I was greatly interested in this fact and have often employed myself in experimenting on stone implements, frequently fancying, I hope correctly, that I had fathomed the intention of the long-dead maker.

Hence I was deeply interested in your photos and very glad to get the copy of your paper which you were so kind as to send me. I wish I could hope that I might some day see your collection, but my visits to England are few, especially during wartime, and more or less limited by strict business.

I am, yours very sincerely,
BERTRAM C. A. WINDLE."

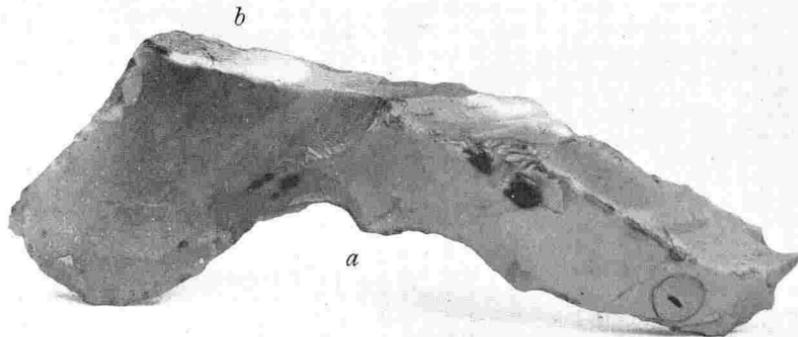
Tools with a general adaptation to the hand are of course sufficiently common, but the series which are here illustrated have not, I believe, been hitherto observed or figured.* Their most pronounced peculiarity consists in the fact that in several cases hollows have been skilfully chipped out, one beside the other, for the reception of the fingers, and so exactly are they fitted to each digit, that it is possible to estimate the very size of the hand of the original user. Among the following are typical examples of such treatment.

RAZOR-LIKE TOOL OR (?) HIDE-CUTTER.

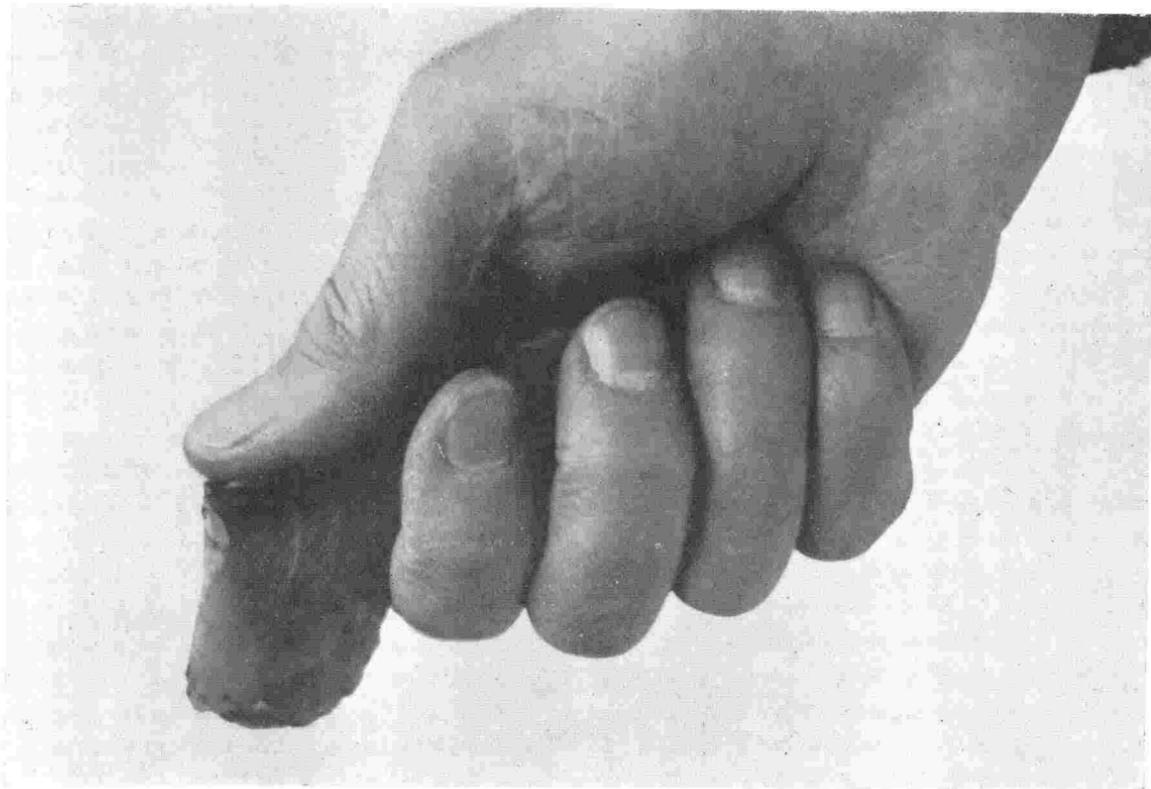
The small razor-like implement which is shown on Plate I proved to be the key to the interpretation of others exhibiting similar devices, and it may therefore be well to describe it in detail. The notches which will be noticed on the ventral edge of the handle (*a*) have all the appearance of hollow scrapers, but are evidently intended to receive the index, second, third and fourth fingers, while the thumb rests on the flat dorsal surface (*b*), and the curved handle falls conveniently into the palm of the hand when grasped. In this position it is easy to see that the broader part forms the knife blade, which view is further supported by the fact that it has been worked to a sharp edge.

It was while handling this strange little object, and wondering which was the working end of it, that my fingers accidentally fell into their proper places. The thumb was on the flattened back, and as the hand mechanically closed round and under the tool, I was conscious of the comfort of the grip. Raising the fingers I then found that they had slipped into hollows

* Except in a short resumé of a paper read by me before the Royal Anthropological Institute, which was published in "Man," Vol. xvii., No. 6, June, 1917.



(?) HIDE CUTTER. ($\frac{1}{4}$)



(?) HIDE CUTTER, shewing method of grasp.

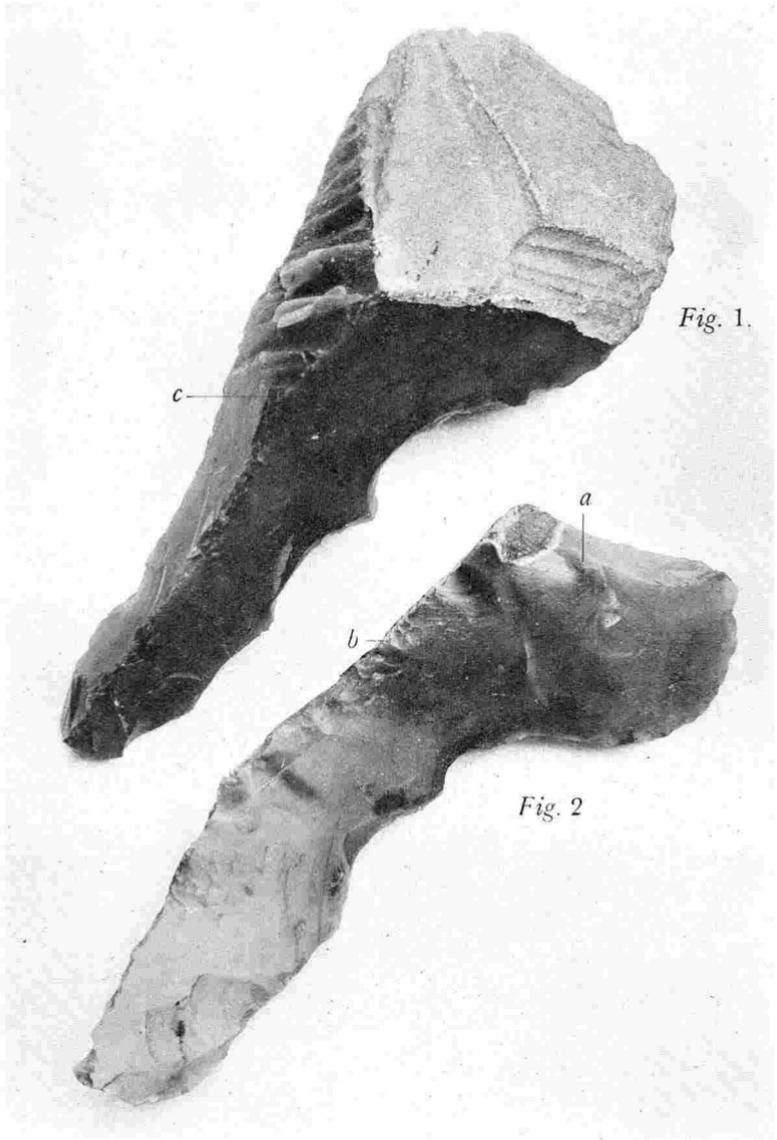
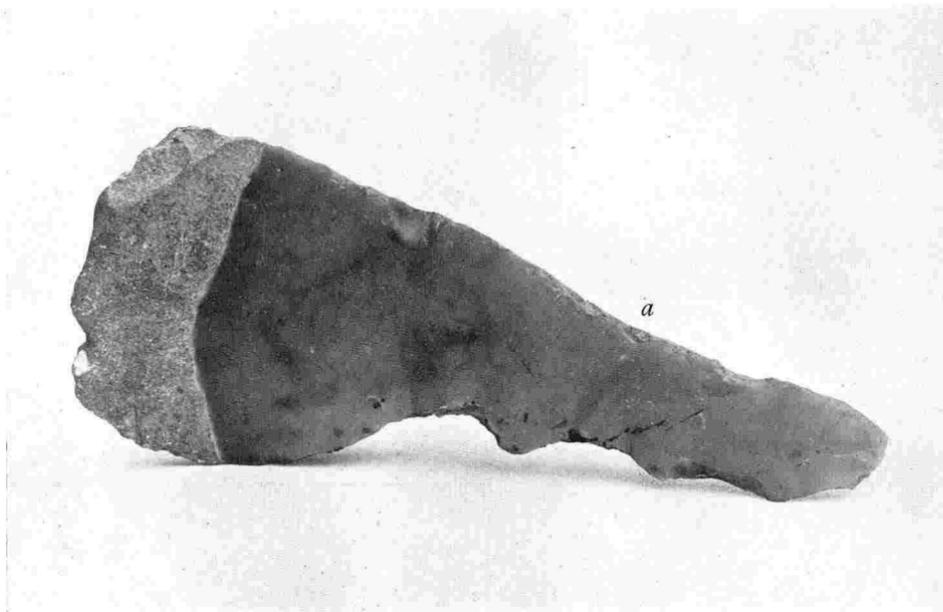


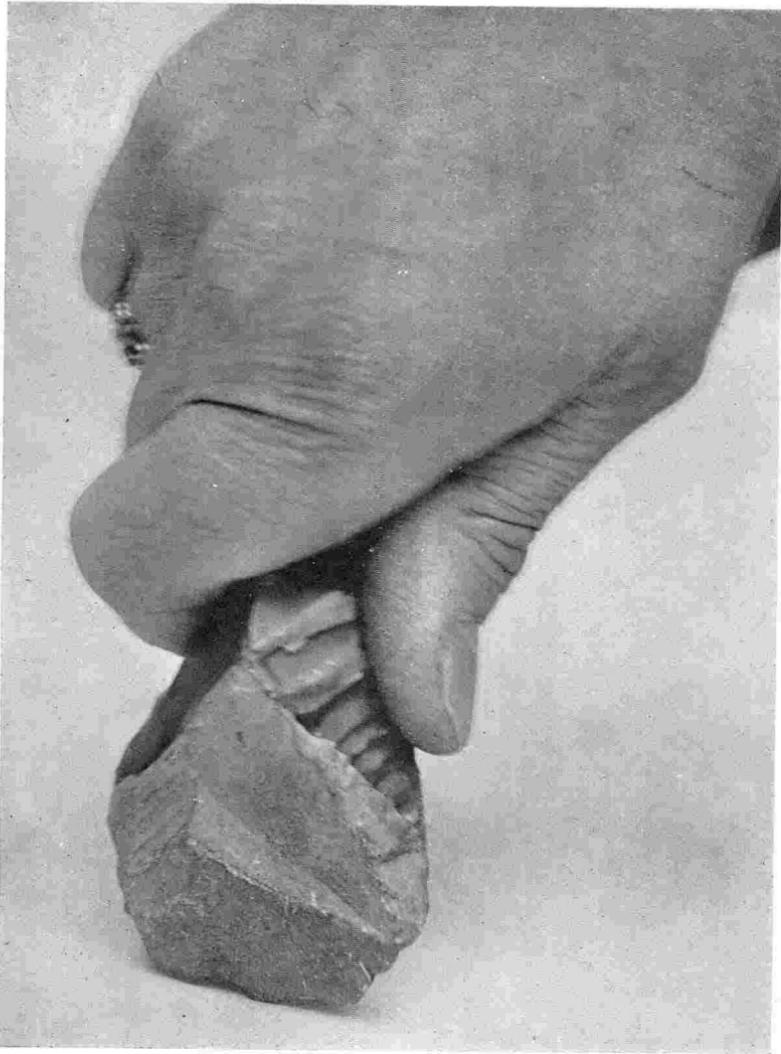
Fig. 1.

Fig. 2

Fig. 1. LONG-HANDLED SCRAPER WITH FINGER GRIPS. ($\frac{1}{4}$)
Fig. 2. RIGHT LATERAL VIEW OF HIDE-CUTTER WITH FINGER GRIPS ($\frac{1}{4}$)



VENTRAL VIEW OF LONG-HANDLED SCRAPER, shewing hollows for fingers ($\frac{1}{4}$).



LONG-HANDLED SCRAPER, shewing method of grasp.

evidently prepared for them (Plate II). A right lateral view is given of the same tool on Plate III., Fig. 2, and it will be seen that there is a well defined bulb of percussion below the striking platform at the blade end of the implement (*a*). The original large size of the flake which has been chipped away to fashion the tool can thus be estimated. The beaten back for the safe-guarding of the palm when brought over what would otherwise have been a sharp edge, is seen at (*b*). It will be noticed what pressure could be brought to bear on the tool when the thumb was in position on the broad flat back (Plate II).

This specimen I believe to have been a hide-cutter, used by the primitive hunter for shaping the skins for clothing*.

A recognition of the purpose of the hitherto perplexing hollows in this tool sent the writer hopefully to examine a drawerful of oddly shaped flints that seemed to require some excuse for their retention. The search was immediately rewarded by the finding of a still more convincing example of the same class of work.

LONG-HANDLED SCRAPER.

In this case the tool is a long-handled scraper, showing precisely similar treatment to the last, that is to say a series of hollows has again been worked out for the accommodation of the fingers, thus producing tool and handle in one. (Plate III., Fig. 1, and Plate IV). The implement is triangular in section, the dorsal ridge rising to a height of 22 m.m. at the centre, and by this means affording an excellent palm rest, and also a grasp for thumb and fingers. The

*This conclusion was arrived at after a visit to an Ipswich tannery, where I watched the process of skin cutting, and dressing, from start to finish.

ridge is beaten to avoid injury to the palm of the hand (Plate III., Fig. 1, *c*) and where, after encircling the handle, the fingers return over the edge, care has also been taken to blunt it in a similar manner. This will be noticed in Plate IV. *a*. The tool is here seen propped up edge-wise to show the notches more clearly.

The outline of this beautiful implement has been produced like the last, by a few purposeful blows, each of which has succeeded perfectly in attaining its object. At the expanding end the natural crust of the flint has been left on, as the tool being intended as a scraper, the rough cortex would serve this purpose admirably. The method of holding it is shown on Plate V.

PRISMATIC TOOL, OR BEAKED (?) HIDE-CUTTER.

Another implement which exhibits treatment as thoughtful perhaps as either of the two already mentioned, is of a form usually described as prismatic (Plate VI., Fig. 1). It resembles the razor-like hide-cutter in the flat but sloping back, cunningly designed to be gripped with the minimum of strain and discomfort, and I believe it to be intended for the same purpose as the implement figured on Plate I. It also resembles it in being shaped to receive the fingers, though in this case, the notches are not separate for each digit. (Plate VI., Fig. 1, *aa*.) It is held in precisely the same position as the razor-tool, with the thumb on the flat back, and the fingers encircling the handle. (Compare Plates VII. and II.) The beak-like end is perfectly suited for cutting skins, and its triangular section renders the point extremely strong. Great power is given to the thumb when in this position. It is of no little importance to notice the preference for using the thumb for pressure rather than the index finger. Out of twenty examples of finger-grip implements, I find that no less than fourteen show this

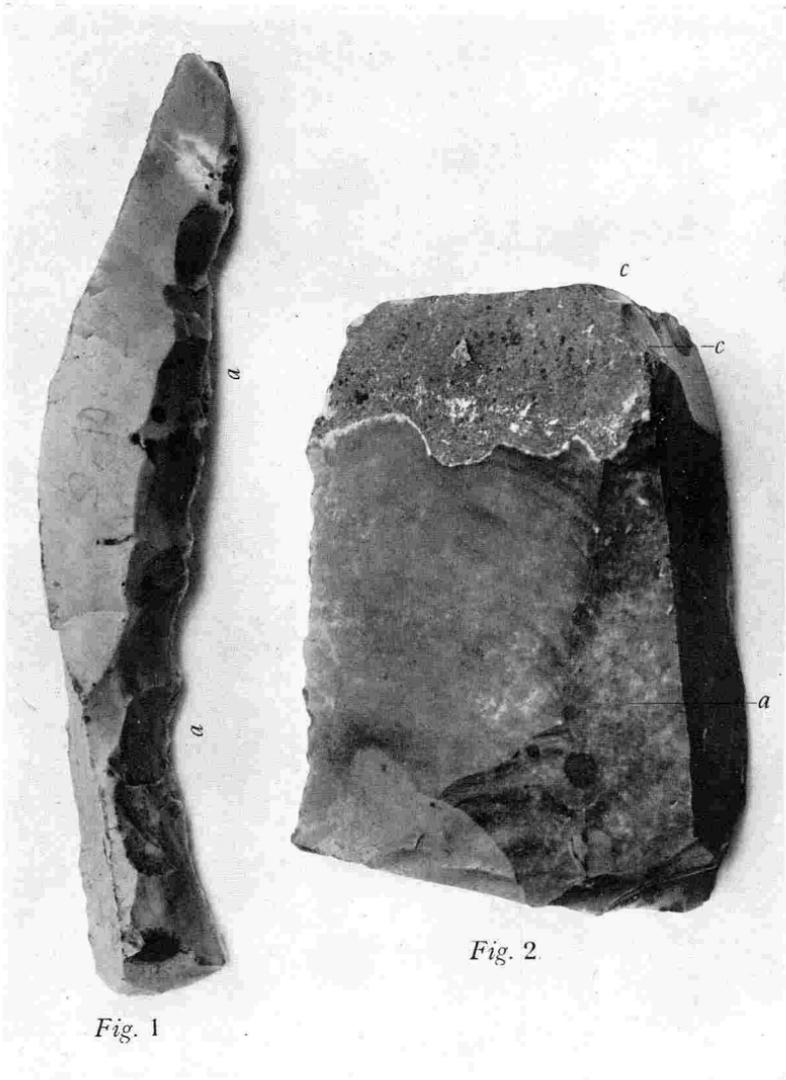


Fig. 1

Fig. 2

Fig. 1. PRISMATIC (?) HIDE CUTTER ($\frac{1}{4}$).

Fig. 2. WEDGE-SHAPED KNIFE. (a) THUMB-GROOVE ($\frac{1}{4}$).

peculiarity. The use of the index finger in preference to the thumb is very marked in different individuals, and it may either prove to be a racial distinction, or merely an indication that the users of the tool were either male or female. The weaker the hand, the greater would be the inclination to make use of the thumb.

HEAVY BORER OR DIBBLE.

An interesting example of what appears to have been a heavy borer, or dibble, from Ashe, Kent, was sent me by Professor Barnes from his collection. (Plate VIII.) Here once more is seen the bold, clever shaping out of the implement, its triangular butt being fitted to the palm, while receptacles for the fingers (*a a*) and thumb (*b*) are again provided. On Plate IX. the hand is shown in position. It will be noticed that the point of the dibble is missing.

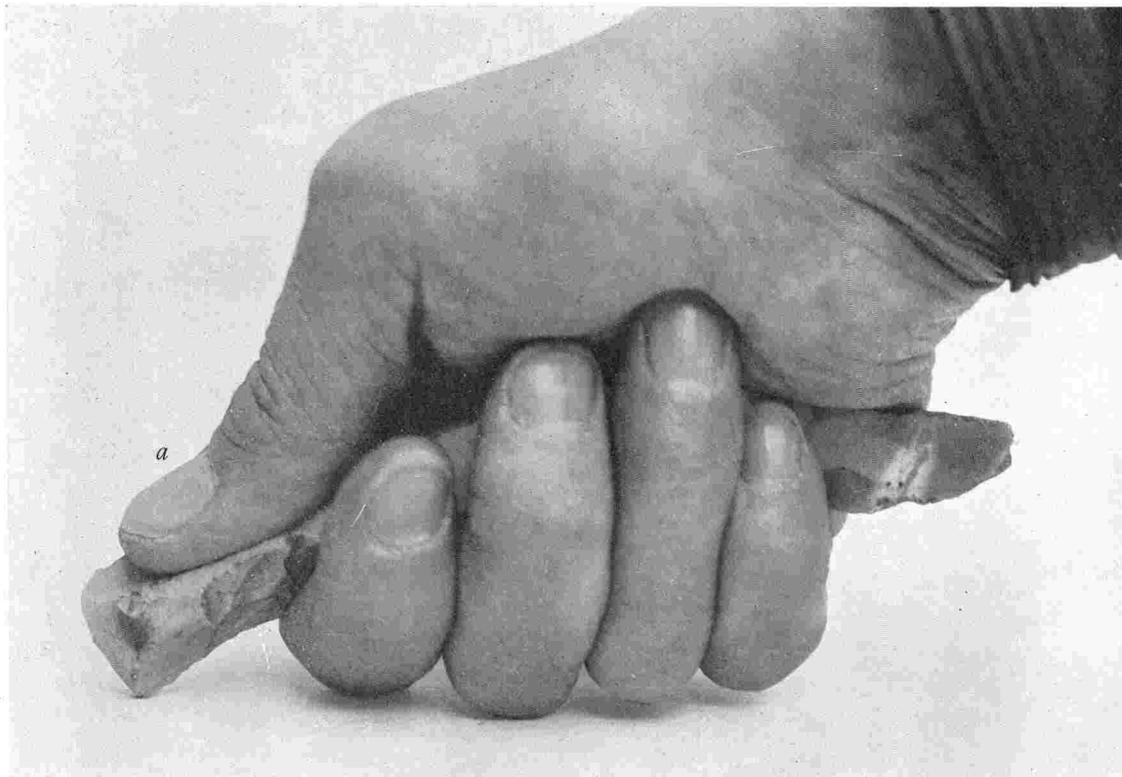
COMBINED CHISEL AND GOUGE.

The illustration which forms the frontispiece of this volume shows a very remarkable implement which is a combined chisel and gouge (see Frontispiece). The sculptured finger-grips, though arranged differently from the last three examples, are as definite and interesting as any hitherto observed. As the tool is a double one, and has to serve two distinct purposes, it is obvious that the shaping of it involved careful forethought. When used as a chisel it was necessary to flake out a thumb pocket and a recess for the index and second fingers. (See Frontispiece, *a, b*), where the two hollows are shown before the thumb and fingers close over them (see Plate X.) The blade end is formed by the junction of sloping facets on the dorsal and ventral surfaces. When held as shown in the illustrations it makes an excellent chisel, and when turned over, an equally excellent gouge. The tool has a boat-like profile when seen sideways, and is

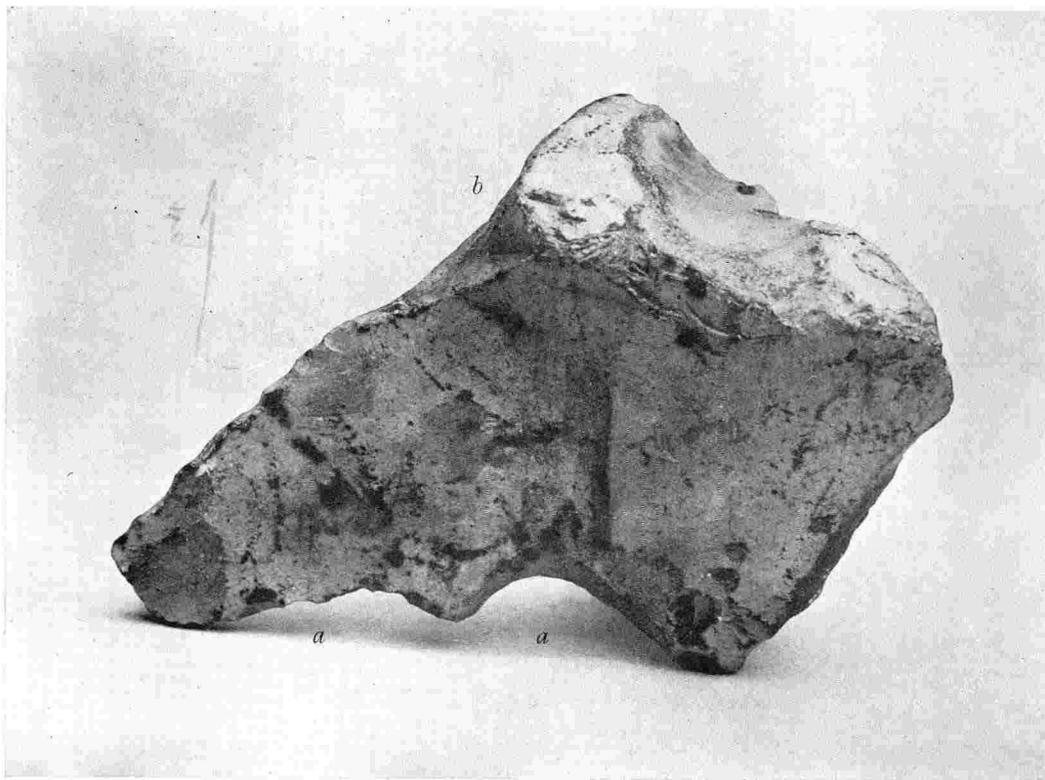
provided with a central pocket for the thumb on the ventral plane of the chisel, which now becomes the dorsal plane of the gouge. At the same time another hollow has been prepared for the index finger, which fits into it exactly when it is serving as a gouge, and will be seen at (*a*) in Plate X. Lack of space has prevented the figuring of the tool in its position as gouge, but the shaping for the two-fold purpose is little short of perfect.

BROAD-BASED BORER.

This boldly fashioned tool which at first sight might give the impression of being a mere splintered spall from a flint workshop repays careful examination. (Plate XI.) A thick and heavy flake has been struck off, having an unusually large bulb of percussion (*a*), and this fits comfortably into the hollow of the hand, forming the palm rest. The tool has been shaped so as to exactly correspond to the cup-like outline of the half closed hand, and flakes have been removed from one edge for the accommodation of the thumb (Plate XII., *a*). The secret of the handling of this tool, which was a great puzzle, has at length been found in the purposeful hollows on either side of the boring end. (Plate XII., *b*, *c*). The smaller of which (*c*) receives the index finger which is brought over it, and the larger (*b*) into which the second, third and fourth fingers naturally fall. The flake which has been removed for this last purpose leaves a two-centred curve, the result of which is that a firm grasp of the tool is obtained. Any doubts as to this mode of handling being correct are set at rest by an examination of the position in which the secondary work, or trimming away of the sharp edge to protect the hand, is discovered. This is found exactly where we should expect it. Where the butt of the tool sinks into the cup of the hand, a series of small flakes have been



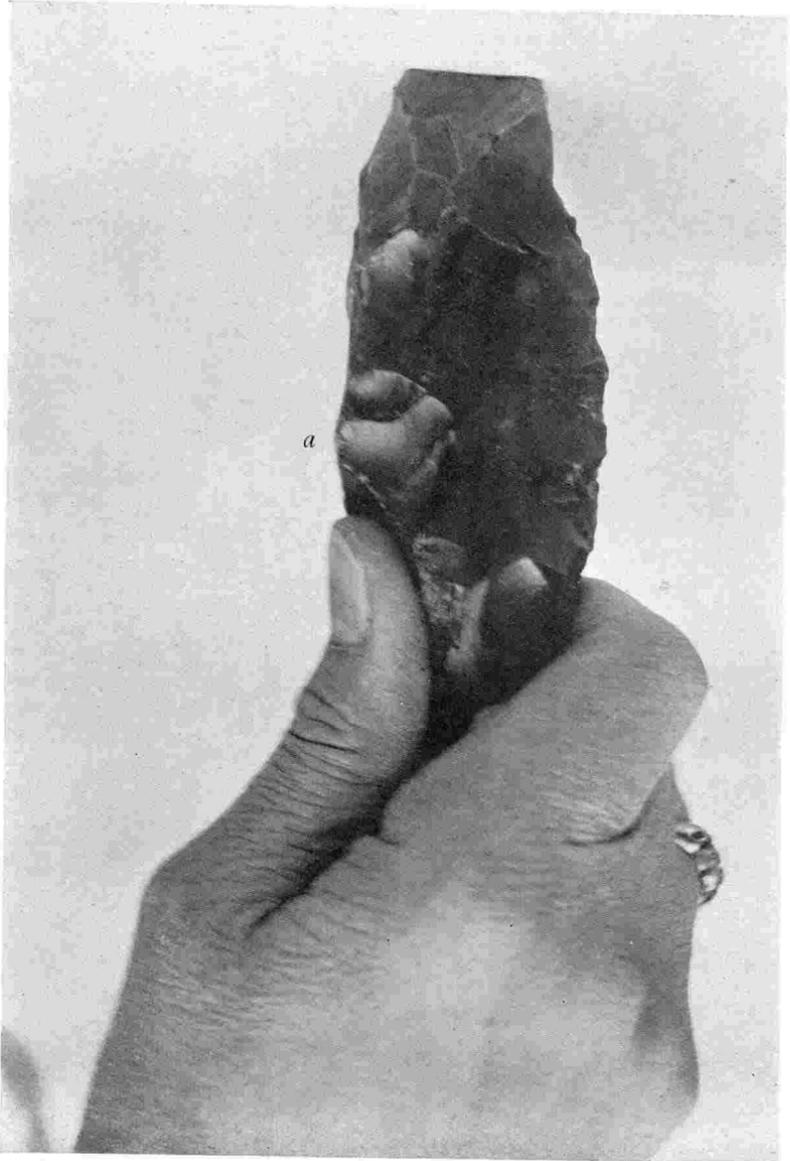
PRISMATIC (?) HIDE-CUTTER, shewing method of grasp.



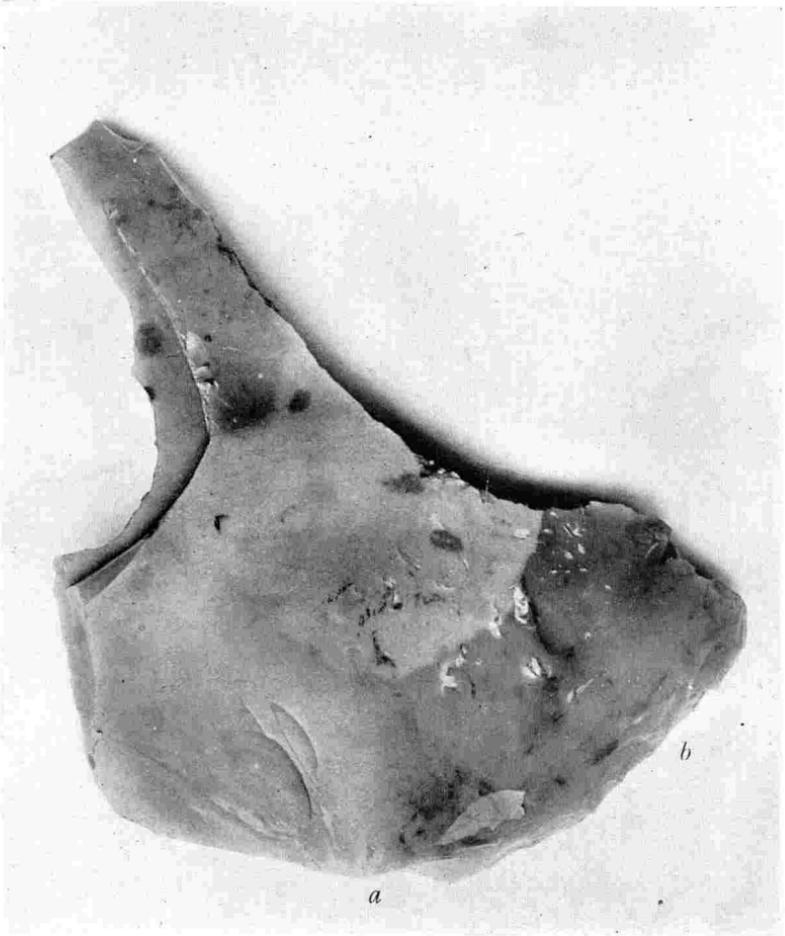
DIBBLE, shewing finger hollows ($\frac{1}{4}$).



DIBBLE in use.



COMBINED CHISEL AND GOUGE, shewing hand grasp ($\frac{1}{4}$).



BROAD BASED BORER (dorsal surface) ($\frac{1}{4}$).



BROAD-BASED BORER as grasped, shewing ventral surface.

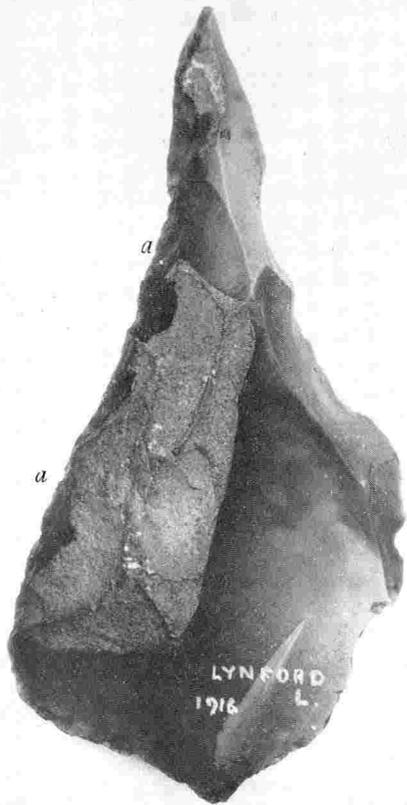


Fig. 1



Fig. 2.

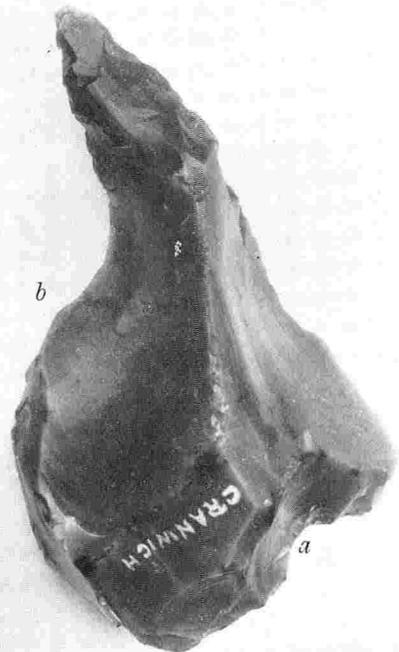


Fig. 3.



THE BORER shewn on Plate XIII., Fig. 3, as grasped ($\frac{1}{4}$).

removed, thus giving it a smooth and rounded contour. (Plate XI., *b*)*, and also where the index finger presses the hollow (Plate XII., *c*) fine chipping has blunted the harshness of its edge.

THE ELABORATION OF THE BORER.

From a large number of borers found in East Anglia I have singled out a few which bear striking evidence to the care bestowed upon their design. As is well known, the simple point was followed by a more perfect boring tool, when by the skilful removal of flakes from different surfaces, a gimlet-like effect was produced. The advantage of this was that instead of the delicate point having to be forced through the resisting material, the worker could so manipulate the tool as to make it cut its way through without too much strain upon it. It was also recognised that the position of the point in relation to its handle was as important as the shaping of it, and a variety of attempts to attain perfection in this direction is noticed.

The three borers shown on Plate XIII., Figs. 1, 2, 3, illustrate these different methods and their comparative success.

In the first (Fig. 1) which is of a flattish form, the point practically runs parallel to the dorsal ridge, and in consequence, for any downward work, impedes the free turning movement of the wrist.

The next example (Fig. 2) shows two definite improvements on the last. First it has a thicker butt, which at once provides a palm-hold and also the required weight to assist the work, and secondly, instead of the mere beating of the left lateral edge to save the fingers which come over it (Fig. 1, *a*) the tool has been hollowed out by a succession of bruising

* This, unfortunately, does not appear in the photograph.

blows (Fig. 2, *a*).* This undercutting also serves the important purpose of causing the point to lean over, which for downward work at once relieves the strain upon the wrist.

But the absolute perfection of a flint borer is arrived at when the original of Fig. 3 is examined. With the minimum of work, because each blow has accomplished its intention, this miracle of flint-craft bears testimony to the complete mastery of his material to which the stone worker attained by long practice. No photograph can really do justice to it. To handle the tool is the only way to arrive at an appreciation of the dexterity of its originator. It is flaked to correspond to the curves of the hand, and has a point so inclined as to leave the wrist perfectly free when it is in use. (Plate XIV.) The implement fits a small woman's hand, and suggests by its measurements that the fingers were short in comparison with the size of the palm. The section of the tool is triangular, but in use it was turned on one side, so that the right latero-ventral edge becomes *pro tem* the dorsal ridge. At the junction of the thumb and index finger it has been hollowed to avoid cutting the hand (Plate XIII., Fig. 3, *a*).

As an examination of the three figures on Plate XIII. will clearly show, Fig. 2 is a modification of Fig. 1, and Fig. 3 again is a modification of Fig. 2. High-water mark is reached when the clean, two-centred hollow receives the fingers (Fig. 3, *b*) in the place of the clumsy battering which bruised out a similar pocket in Fig. 2, *a*.†

* This is strikingly seen on the ventral surface of the tool though it does not show in the photograph.

† If this hollow has been produced by thermal action, which is possible, the tool-maker must have chosen the piece of flint for this particular purpose before shaping out the rest of the implement.



WEDGE-SHAPED KNIFE as held.

FLINT KNIFE.

To return to Plate VI., Fig. 2, a simple but ingenious device is here shown for holding a flint knife without a handle. The flint which is shaped like a slice cut from a circular cake, has a broad flat back, and is flat at the top. In this case the index finger directs the work, as shown in Plate XV. For the accommodation of the thumb a long flake (Fig. VI. *a*) has been removed, while a few deft blows have modified the sharp angle at (*c*).

The discovery of tools with such striking peculiarities as the most pronounced of these finger-grip specimens show, led the writer to hope that we should presently be able to identify, by their fashioning, the culture to which they belong, but at present we have not sufficient examples forthcoming from other museums to make any such attempt possible. Two implements approximating in their treatment to the remarkable examples shown in Plates I., IV., and VIII., are to be seen in the late Dr. Sturge's collection. They are Egyptian, and were purchased by him at Luxor. (Plate XVI. Fig. 1, 2). It is possible, however, that these hollows were intended to hold some material wrapped round the tool, as they do not fit the hand comfortably.

Among living aboriginal tribes the nearest approach to this mode of shaping a handle to the fingers, is probably to be found among the North Alaskan Eskimos. We are all familiar with their stone scraper blades so like our own thumb scrapers, but it is to their scraper handle that I would like to draw attention, as it is this that suggests a possible development from the original unhafted finger-grip implement. Wood, horn, or walrus ivory are now made use of by the Eskimo to form handles into which the stone scraper is inserted, but these instead of being simple hafts are elaborately supplied with pockets to receive the

fingers. Three views showing such an Eskimo tool in three positions will illustrate this peculiarity. They are taken from Dr. Sollas' "Ancient hunters" (Plate XVI., *a, b, c*).

In the first (*a*) is seen the thumb groove, and two depressions for the index and second fingers.

In the next (*b*) where the tool is turned the other way round a scooped out pocket is arranged for the third and fourth fingers. This hollow traverses most of the flat base of the implement.

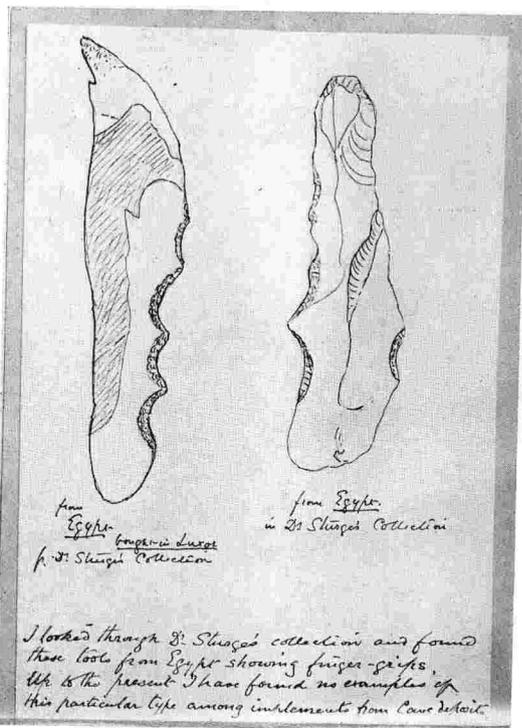
In the third (*c*) the bottom of the tool with this groove is shown, and into the curiously shaped handle a circular stone scraper will be seen to be fixed.

As Dr. Sollas remarks, "Wherever the Eskimo occur they are distinguished not only by uniformity in bodily characters and habits, but also by their implements," so that it is not impossible that this conservatism has preserved for us a clue to finger-grip tools which they may have made use of in remote ages, and in a different locality, where flint was sufficiently abundant for handle and blade to be made all in one.

Dr. Sollas is of opinion that the Eskimo may have sprung from Magdalenian races who lived in the south of France, but with this question I am incompetent to deal. Tools of Magdalenian type have certainly been found in Suffolk, and some of the gratoirs closely resemble those from Laugerie Basse. The *bec-de-perroquet* which is often to be found in Suffolk, is practically a replica of those figured by the Abbé Brueil from a Magdalenian site.

Should it ever be proved that the Eskimo are indeed a survival of these latest of Palæolithic cave-dwellers, then it may also at least be open to conjecture that in some of the more elaborated of these finger-grip tools from East Anglia survivals of his ancient handiwork are still to be seen.

Fig. 1.



EGYPTIAN IMPLEMENTS FROM LUXOR.
Sketched from the originals by N. F. Layard

Fig. 2.

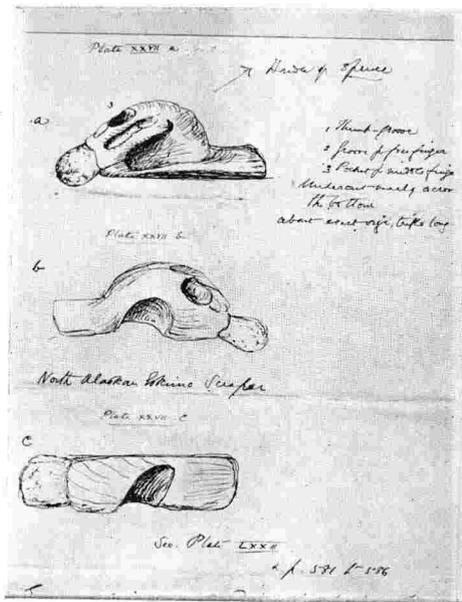


Fig. 3.

SKETCHES OF AN ESKIMO SCRAPER
with finger pockets in the handle.
(from Dr. Silliman's "Ancient Hunters.")

NOTE.

Sir Ray Lankester, who authorizes me to say that he is in full agreement with the foregoing conclusions, has sent for comparison the implement figured on Plate xvii., Figs. 1 and 2. This remarkable tool, which may well be looked upon as a forerunner of the later specialized hand-grip implements, was obtained by him from a workman at the gravel-pit of St. Acheuil, Amiens, in 1863, and he was immediately struck by its "fitness" for the finger-grasp. It is probably early Acheuillian or Chellean, being ovate in form with a heavy butt, which fits a large hand. In colour the tool is ochreous and green, with the characteristic glaze, and the edges are worn.

The flint-nodule from which the implement was fashioned was evidently chosen, as Sir Ray Lankester observes, on account of several natural hollows, with cortex surfaces, which were noticed as suitable to receive fingers and thumb, and thus to prevent the tool from slipping out of the hand when in use. The flint was so trimmed that the user could avail himself of these pockets. On Plate xvii., Fig. 1, the details of the left face of the implement are seen. "a" is a natural cup to receive the thumb, "b" is the plane (also natural) for the fore-finger, while "c" is the working end of the tool. On Plate xviii., Fig. 1, is a view of the hand grasping it.

When the implement is turned over we find another natural depression (Plate xvii., Fig. 2, *d*) and here the second joint of the middle finger rests (Plate xviii., Fig. 2). All the rest of this surface, including the part marked *e* is flaked.

This veteran tool, with natural finger-grips, whose use was recognised by Sir Ray Lankester no less than fifty-six years ago, is a useful object lesson. It shows how man observing the use to which accidents of form could be put, pondered over the subject, and presently manufactured for himself what he could not always obtain otherwise.

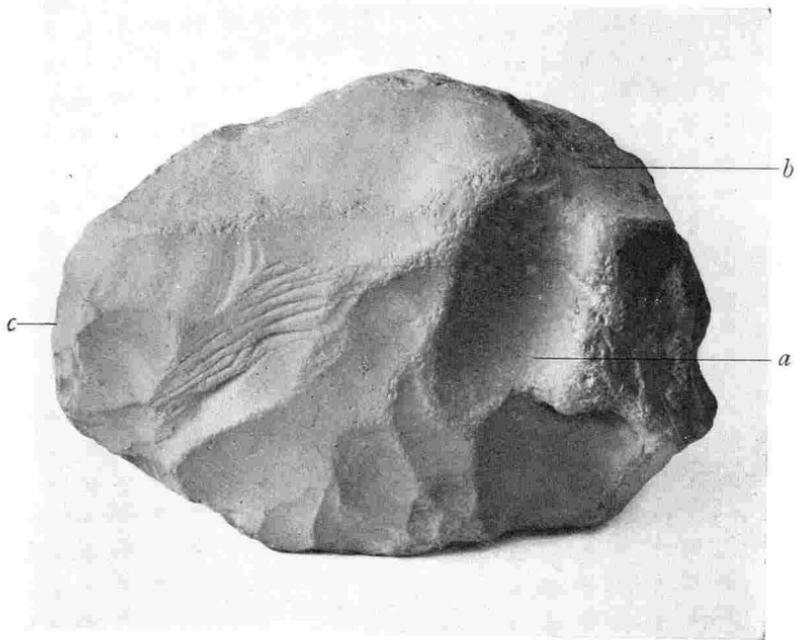


Fig. 1.

LEFT FACE OF A FLINT TOOL FROM ST. ACHEUIL, showing natural finger-hollows.

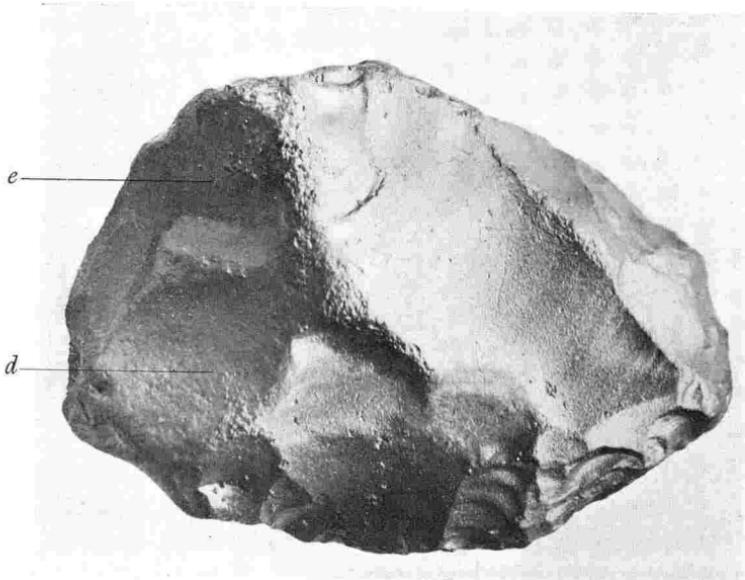


Fig. 2.

RIGHT FACE OF THE SAME.

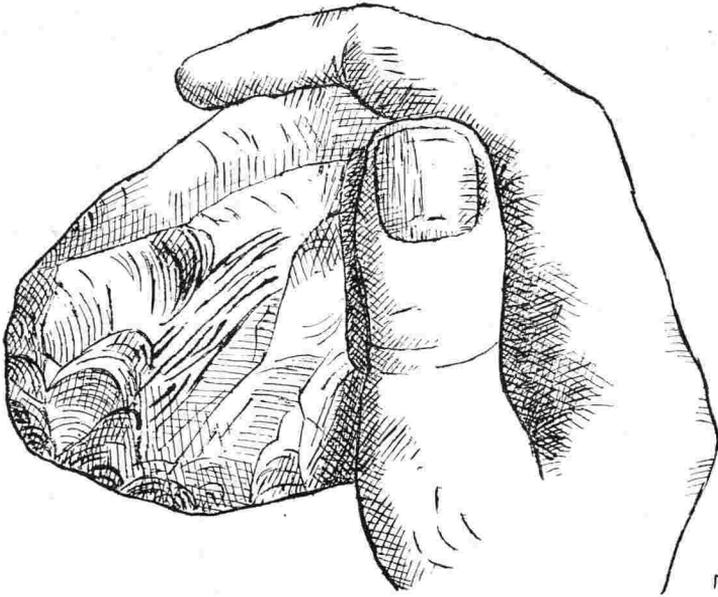


Fig. 1.



Fig. 2

METHOD OF GRASPING THE ST ACHEUIL IMPLEMENT.