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THE OLDER PALÆOLITHIC AGE IN EGYPT.¹

[WITH PLATES I-IV.]

By C. G. SELIGMAN, M.D., F.R.S.

THE following paper presents the results of the study of a considerable number of flint implements from the high desert of Egypt, for the most part collected by myself during the early part of 1914, when an attempt was made to obtain definite stratigraphic evidence as to the antiquity of implements exhibiting a technique which in Europe would be classed as Chellean, Acheulean or Mousterian.

The sites visited were Abydos, Thebes, Tell el-Amarna, Meir, and the Wady Sheikh.

One result was immediately obvious—for descriptive purposes certain areas can be described as “flintless,” for whereas flints of palæolithic type were everywhere common in the neighbourhood of Abydos and Thebes (where indeed flakes, probably, as will be shown, of Upper Mousterian age, can only be described as overwhelmingly abundant), worked flakes of palæolithic type were not only relatively, but absolutely, scarce in the neighbourhood of Meir and Tell el-Amarna. At Meir, a week’s search in the neighbourhood yielded only five undoubted pieces of Mousterian technique, namely, two small flakes (one point and one scraper) and portions of three other implements, while at Tell el-Amarna even fewer specimens were found, nor were any Chellean or Acheulean specimens found at either site.

With regard to the Wady Sheikh no stones of definite palæolithic type were seen, a result foreshadowed in Dr. H. O. Forbes’ publication,² since of the

¹ In collecting and working up the material I have received the freest assistance from many friends. I would especially mention the late Dr. Sturge, who, when I was embarking on this work in 1914, placed his great collection at my disposal and gave me much valuable advice. Sir Hercules Read, Professor Flinders Petrie, and Mr. Leeds have given me access to the collections with which they are associated. Messrs. Henry Balfour, Miles Burkitt, and Reginald Smith have been of constant assistance in questions concerned with typology and distribution. In Egypt my indebtedness is equally great; without Professor Naville’s hospitality and assistance it would have been difficult, if not impossible, to work at Abydos, and I am also indebted to Dr. Blackman for putting me up at Meir. Dr. Hume, Director of the Survey of Egypt, besides helping me in many ways undertook a special journey to report on the gravels in which I had found worked flints. Mr. G. W. Murray has sent me collections made by himself on new sites in the Eastern Desert, while I would also mention Dr. Borchardt’s courtesy in allowing me to make use of the German House at Thebes. But above all am I indebted to two of my oldest friends, to Mr. A. B. Solomon for helping me collect, label and pack a very considerable mass of stones, as well as for taking a large number of photographs (including those reproduced here), and to Miss M. C. Jonas for the time and care she has ungrudgingly given to the drawings illustrating this paper.

² “On a Collection of Stone Implements . . . discovered . . . on the Plateaux of the Nile Valley,” *Bulletin of the Liverpool Museums*, vol. xi, 1900, Nos. 3 and 4.

numerous implements he figures there is only one which might be considered of palæolithic form. Here, however, specimens were found of early historic date which are valuable from the light they seem to throw on the patination of the high desert specimens of palæolithic technique.

The literature of the subject is perhaps scantier than its importance and interest might suggest. It was in 1882 that Pitt Rivers,¹ then President of the Institute, published his paper in which he recorded the discovery of worked flakes *in situ* in the gravels in the neighbourhood of Sheikh Moussa, the modern burial ground of Thebes. This led to discussions, in which both archæologists and geologists took part, as to the age of the surface pieces of palæolithic shape found in abundance on the high desert. Dr. Forbes,² Mr. H. J. L. Beadnall,³ Drs. Schweinfurth⁴ and Blanckenhorn,⁵ have all written on the subject and their views have been discussed by Dr. H. R. Hall,⁶ who figures a number of specimens collected by himself. Schweinfurth's latest paper, probably still valuable from the geological side, is vitiated by his determination to see eoliths everywhere, much more advanced implements being regarded as eolithic.

Of more recent literature may be cited Professor Petrie's⁷ discussion of the whole Egyptian stone period and the account by Dr. F. H. Sterns⁸ of a collection formed by Mr. G. W. Murray in the Eastern Desert and presented by him to the Peabody Museum. The latter, with photographic reproductions of every stone in the collection as well as some in the Museum previously, is for the most part in the nature of a *catalogue raisonné*; the former, while it makes certain assumptions and draws certain conclusions with which many will not agree, is valuable principally for its breadth of view and for its record of a precise stratigraphical observation made at Naqada.⁹ Mr. Currelly's recent publication, the catalogue of the worked stones in the Cairo Museum,¹⁰ figures a number of specimens of the older palæolithic age, but the absence of adequate elucidatory letterpress, due largely to the fact that the exact provenance of most of the specimens in the Museum is unknown, greatly reduces its value. On the comparative side for Europe I have found Commont's monograph, *Les Hommes*

¹ "On the Discovery of Chert Implements in Stratified Gravel in the Nile Valley," *Journ. Anthropol. Inst.*, vol. xi, 1882.

² *Op. cit.*

³ "Neolithic Flint Implements from the Northern Desert of the Fayum, Egypt," *Geological Magazine*, 1903.

⁴ *Steinzeitliche Forschungen in Oberägypten Zeitschrift für Ethnologie*, vol. xxxvi, 1904.

⁵ *Zeitschrift der Gesellschaft für Erdkunde zu Berlin*, 1902.

⁶ "Palæolithic Implements from the Thebaid," *Man*, 1905, 19.

⁷ "The Stone Age in Egypt," *Ancient Egypt*, 1915.

⁸ "The Palæoliths of the Eastern Desert," *Harvard African Studies*, i, 1917.

⁹ *Op. cit.*, 1915, p. 62 and Figs. 5, 6 and 7 on p. 61; cf. *infra*, p. 136.

¹⁰ *Catalogue Général des Antiquités Égyptiennes du Musée du Caire*. "Stone Implements," by Charles T. Currelly, 1913.

Contemporains du Renne dans la Vallée de la Somme (1914) most useful, while for Africa this applies equally to the papers contributed by MM. de Morgan, Capitan, and Boudy, to the *Revue de L'École d'Anthropologie* (Paris), 1910 and 1911, under the title “Étude sur les Stations Préhistoriques du Sud Tunisien.”

The material upon which my own work is based consists of the following series :—

- (i) The specimens collected at Thebes and Abydos in 1914.¹
- (ii) A small collection made in 1908 from the slopes of Thoth Hill near Thebes, the height at which each specimen was found being noted.²
- (iii) A large and valuable series collected by Mr. G. W. Murray from Hammama Wasif, and Wady Dib, sites newly discovered by himself in the Eastern Desert. These sites lie between 26° and 27° N., Hammama being some 40 km. east of Keneh while Wasif is on the other side of the Nile-Red Sea watershed about 100 km. farther east. The Wady Dib is about 160 km. north of Hammama on the Red Sea side of the watershed in an almost waterless region.
- (iv) A number of selected specimens from the Sturge Collection.

The implements themselves may be classified as follows, the “period” given in the second column being that to which they would be assigned if they were of European origin. Forms which, as far as I know, do not occur in Europe, are printed in italics.

Hand-axes, Chelles and St. Acheul.

Hand-axe with borer point

Finely worked ovates St. Acheul.

Points }
Side-scrapers } Le Moustier.

Borers }
Concave scrapers } These forms are not specially typical of the
Crescents } Mousterian but are grouped here with the
Tortoise point (*infra* p. 126) } type points and side-scrapers for reasons
Tanged spear and arrow heads } connected with the localities of the
finds, stratigraphy, and patination.

Notched flakes }
End-scrapers }
Concave end-scrapers } Transitional to Capsian or Capsian.
Nose end-scrapers }
End borers }
Asymmetric end-borers }

¹ Including a number collected by Miss Mary S. Johnston, to whom my best thanks are due for the loan of many of her specimens and for other assistance.

² By Thoth Hill I mean the highest hill in this part of the Qurneh hill mass. Its peak, upon which stand the remains of an XIth dynasty chapel, is over 1200 feet, a few feet higher than the Qorn, the great peak overlooking Thebes about a mile south of the Farshut road.

The allocation of the specimens to these periods will be discussed later, meanwhile I will only say that from the morphological standpoint the River-drift types are unmistakable. The Mousterian types, as far as the points, scrapers and borers go, are equally typical and can be paralleled precisely by west European forms, while those that do not resemble European forms can, as I shall show later, be derived from well-known types, or else the process by which they are fashioned will be shown to be identical with those by which the latter were produced.

The great majority of the specimens of River-drift types show a Chellean or somewhat coarse St. Acheul technique; only a few implements are of the fine St. Acheul type with relatively small delicate facets, the flaking of the majority of the hand-axes, though free and unconstrained, and obviously the work of men who knew exactly where each blow should fall to produce a given effect, being decidedly coarse. This relative coarseness is equally marked in the majority of the implements of Mousterian type, being especially obvious in the "points" and Levallois flakes, many with but slightly trimmed edges. These constitute by far the larger number of the implements found upon the high desert, the exceptions to be noted being some few scrapers and certain of the large "crescents" discussed on pp. 124 and 125.

A certain number of specimens cannot readily be referred to either a Chelleo-Acheulean or Mousterian technique. If the west European forms be taken as standards, some of these would be regarded as Aurignacian of the coarser type, or they might be regarded as of the age of the Abri Audi culture (though the Abri Audi point has not been found), and be termed Mousterio-Aurignacian (in Africa Mousterio-Capsian), if it be admitted that transitional forms exist. Personally I am inclined to regard these as highly developed Mousterian, the industry having been modified by Capsian influence from the North.¹

In comparing the specimens from the Nile Valley (Abydos, Thebes) with those from the Eastern Desert, certain conditions and reservations must be kept in mind. In the Nile Valley, especially at Thebes, the carrying away of palæoliths has been extensively practised, not only by dealers, but also by Europeans who have regularly sent out natives to bring them every decent specimen they could find, so that it is

¹ It being now generally recognized that it is impossible to explain the succession of palæolithic types by any simple scheme of development *in situ* of each type from its predecessor, there does not seem to be any reason why our current ideas with regard to contact-metamorphosis should not be applied to the races of palæolithic man in the same way as they are applied to problems of distribution at the present day. On the application of this point of view M. Breuil, who has long regarded the Aurignacians as probably African in origin, and as having colonized the whole Mediterranean basin, has written to me as follows:—"In the neighbourhood of the Sahara, Capsian influence appears to have been exerted up to a period as late as the Tardenoisian and proto-neolithic, due, perhaps, to a condition of affairs analogous to those that produced the northward Capsian-Azilian-Tardenoisian wave which led to the substitution of their civilization for that of the Western Magdalenians. The mixed characters of the races of Ofnet (Bavaria) and Mughem (Portugal), but with the Mediterranean type predominating, accord well with this point of view."

no exaggeration to say that sacks full have been removed each winter, without the least regard to the position or site of collection. Such "collectioneering" could have only one result; the great majority of the larger and better worked and more obviously valuable specimens have been picked up years ago. This especially applies to the hand-axes and crescents, so that there are scarcely any of these left at the present day.¹ The Mousterian implements have not proved so profitable; the native for the most part regards them as mere flakes left over from the manufacture of the more massive types, and although plenty have been carried away, the desert has not been skinned of these to anything like the same extent.

Mr. Murray's collection from the Eastern Desert from new sites discovered by himself is not at this disadvantage, and a large proportion of his specimens are of the Chelles or St. Acheul type, flakes forming relatively a minority.

The environmental conditions prevailing at Thebes, Abydos, and Meir may, apart from the amount of sand present, be regarded as identical. At Thebes there is practically no sand, and the edges of the specimens, even of the most delicate flakes, are perfectly sharp. There is more sand at Abydos, and a number of specimens show the effect of blown sand, especially such as were found near the top of the Wady, sanded up for over two-thirds of its extent, which was our usual mode of ascent to the high desert.

At Meir, where the desert is comparatively low and there is more or less sand everywhere, every specimen of palæolithic type had the crests between the facets smoothed, and its surface finely pitted, in some instances showing a lustrous polish.

I have no first-hand knowledge of the conditions prevailing at Hammama and Wasif, but none of the flakes shows any evidence of the action of blown sand; moreover, Mr. Murray tells me that there is now no sand at Wasif and very little, or perhaps none, at Hammama. Nevertheless, both from Thebes and Hammama a few specimens of River-drift type have had their facets so much worn that they present a generally smoothed aspect, while their patination seems to go deeper and to be very much softer than is usually the case. The condition they present would be accounted for, if it be supposed that they are stones which lay on the surface for some time, precisely at that period when the vegetation-bearing surface layer had weathered away, but before the sandy detritus formed from it had been disposed of, and that it was this detritus which smoothed the crests; just as to-day the sand at Meir and in the neighbourhood of Abydos is giving rise to typical *dreikanTERS*.

Before discussing particular types I would point out that flints of both River-drift and Mousterian forms and technique are found at every altitude, i.e., there is nothing, as far as my observations go, in the surface distribution of these flints at the present day to indicate that the one type is more ancient than the other. Thus in 1908, in walking up Thoth Hill and without turning aside to make special search, I picked up Mousterian flakes at heights of 400 (1), 700 (5), 800 (2), 900 (1), 1400 (2),

¹ Thus only one crescent was picked up in the fortnight or so at Thebes in 1914.

and 1500 (6) feet, tortoise cores at 700 (4) and 900 (1) feet and implements of Drift type one at each 700, 1000 and 1400 feet..

The great majority of implements from the Thebaid, whether of Drift or Mousterian type, present a more or less lustrous surface of a yellow-brown, deep brown, brown-red or mahogany colour, or of a tinge of orange flecked with black, while of the two faces of the same implement one is almost always darker than the other. But besides this typical range of surface coloration which, as will be shown later, is due to prolonged exposure to light and weather, and to which I shall refer by the term "palæolithic patina," a certain relatively small number of implements of every type are to be found of the different shades of dull white, "stone" colour and pinkish grey, and these are often irregularly mottled or marbled. As far as my personal experience goes, specimens of these colours do not occur on the high desert plateau;¹ they are, however, by no means uncommon in the wadys and also occur in relatively small numbers in the washouts and debris of washouts which exist, *e.g.*, in the neighbourhood of the Tombs of the Queens.

This distribution was puzzling until a certain number of specimens, all whitish or light grey in colour, had been found *in situ* in the undisturbed faces of gravel cliffs, when it was realised that the lighter coloured pieces found in wadys, predominantly at their edges, *i.e.*, at the foot of the cliffs forming their sides, were light coloured because it was only comparatively recently that they had weathered out of the cliffs.

The two figures on Plate I, being reproduced with a brown ink, give a moderate idea of the difference in appearance presented by similar implements according to whether they have been exposed on the face of the desert or have been preserved in a gravel. Of the two tortoise cores one was found on the surface, the other removed by myself from the hard cemented gravel of Sheikh Moussa; the deeply coloured Levallois flake is from the Sturge Collection, the whitish specimen was found by Miss Johnston in a washout in the neighbourhood of the Tombs of the Queens.

II.

Implements of River-drift Type.—The greater number of these are somewhat coarsely worked, *i.e.*, the final surface is produced by the removal of a comparatively small number of relatively large flakes; but it must not be thought that these tools are poorly fashioned or unskilfully worked, and, as already stated, they were evidently made by men who had in mind exactly where each blow should fall. It may be suggested that it was the certainty of producing the result aimed at that allowed the retention of a considerable portion of the original rough skin of the nodule, as is so often the case. These implements are so well known that it does not seem necessary to describe them at length or to reproduce any number; excellent examples

¹ This observation is borne out by the fact that of the large number of implements from Hammama and Wasif sent me by Mr. Murray, there was only one of greyish-white colour, and here was nothing to show that this has not been found at the foot of a cliff or bank of gravel.

are figured, *e.g.*, by Currelly in the *Cairo Catalogue*. One of the heavier, rougher type Chellean hand-axes is shown in Drawing No. 1 ; its importance as being derived from a gravel is discussed later, meanwhile attention may be drawn to its characteristic shape.

The specimen from Hammama reproduced as No. 2 is especially interesting, as it is worked into a definite short stout boring point. This has been attempted in two other specimens, from Hammama and Um Selimat respectively, but in neither of these has the same degree of success been obtained. I can find no record of any European implement of hand-axe type and Drift age with a similar boring point, but an approach to this condition is figured by de Morgan, Capitan, and Boudy from El Mekta to the north of the oasis of Gafsa.¹

With these coarsely flaked implements may be compared a small delicately worked ovate, No. 3, from Mahamid, overlooking the Nile Valley, also collected by Mr. Murray ; the work here is of the finest late St. Acheul type. An approach to the fine quality of this disc is shown by a large and decidedly coarser specimen from Wasif ; almost circular in outline, and lenticular in section, its maximum length being 10 cm. and its greatest thickness about 4·5 cm. It is especially interesting that although this specimen was picked up over 100 km. from the site on which the smaller and more delicately worked disc was found, the coloration of the two specimens is almost identical. In both, one surface is orange speckled with black, the opposite surface being of a rather light brown.

Generally speaking the implements of the Drift types from Thebes have perfectly sharp facets, and present no appearance of being water-worn. But this is not invariably true ; I have myself collected three specimens which seem to present every appearance of water action. The first of these is a small roughly worked hand-axe of early Chelles type rather over 8 cm. long, retaining much of the original crust of the pebble ; the second is a rather larger and heavier tool with the point missing, the fracture being old ; while the third is a distinctly better worked lenticular disc, one surface being much more convex than the other ; this specimen has lost a portion of its periphery by old fracture. In all these specimens there is a certain smoothing of the crests between the flake scars,² and the patina, thicker and softer than is usually the case (so soft that it is scratched readily by a steel tool), is of an orange brown colour speckled with black, and appears worm eaten, the chemical change having gone so far that the surface has begun to disintegrate.

As will be shown later (*cf.* pp. 138–140), a surface of this colour indicates prolonged exposure on the face of the desert, the condition which has given their characteristic colouring to the great majority of implements of palæolithic types from the Egyptian deserts. Its interest in these particular instances is that it indicates that the exposure took place after the implements had become water-worn.

¹ *Op. cit.* 1910, p. 110, Fig. 14.

² I am indebted to Mr. H. Balfour for the suggested use of the terms flake scar and flake bed.

To the River drift group must also be referred a rare 'form of implement, long relatively narrow, prismatic or oval in section, or almost blade-like. The finest specimens of this type that I have seen are three of a deep mahogany brown colour in the Ashmolean Museum, labelled "Wadijen [Wadyen] Thebes," and there are also broken specimens in the Sturge Collection; No. 4 represents one of these.

Implements of Mousterian Type.—Many of the Mousterian flakes from the high desert of Egypt differ somewhat in form from those commonly found in Europe. A considerable number are longer and narrower, such as No. 5, which is nearly 11·5 cm. long, and scarcely 3 cm. broad, or their form may immediately suggest a spearhead in a way which European specimens do not (No. 6).¹ With regard to technique, the flaking is commonly coarser than in European implements (though a few of the finest scrapers are exceptions), and there are many specimens in which the retouching is of the slightest; this is especially true of many Levallois flakes. Nos. 7 to 21 give a general idea of the facies of this industry, a number of the specimens being relatively coarse, thick and heavy, *e.g.*, the points Nos. 8 and 9 and the scraper No. 13 removed from the mass of gravel shown in the photograph reproduced as Fig. 2 of Plate II.² Borers or awls, though relatively uncommon, constitute a definite type of Mousterian implement from the high desert. The specimen shown as No. 15, bought by Dr. Sturge in Luxor, is an unusually fine example. It consists of a typical Mousterian flake showing bulb of percussion and faceted butt. It is of rather dark grey colour, *i.e.*, it is only slightly patinated. Another less beautiful specimen collected by myself shows an old palæolithic patina which has exfoliated in parts, allowing a rough rusty red surface to appear in patches, which, when magnified, are seen to have irregular edges which look as if worm-eaten. A portion of the original surface forms a stop, and the point appears to have been retouched at a period subsequent to its original manufacture. Another borer which may be considered here is that reproduced as No. 16. It may perhaps be regarded as a more advanced specimen showing Capsian influence.

Notches (*Fr. encoches*) are common; No. 20 shows a fairly typical notched flake, only one surface of this implement is shown, but the base also bears a less crescentic notch worked in the inverse sense. Other implements bearing side notches are represented in Nos. 19, 21, 39, 47, and 48, while the asymmetric boring points referred to later (*infra*, p. 130) are produced by working a notch to one side of the median plane of a pointed and somewhat keeled flake. No. 19 is a usual type of rather heavy Mousterian scraper, but remarkable in that it bears three notches on one edge.

¹ Mousterian points which, to judge from their appearance, are frankly spear-heads, are not quite unknown in Europe. Common figures two (*op. cit.*, Fig. 28), one having a notch near its base, destined, he suggests, to prevent the attachment slipping.

² De Morgan, Capitan and Boudy (*op. cit.*, Fig. 28) figure from El Mekta in Tunisia a specimen of much the same size and character, *i.e.*, retaining much of the skin of the nodule and showing the same coarse work.

The tortoise core, called *dufr el homar* ("donkey's hoof") by the Fellahin of the Thebaid, who have been accustomed to collect implements, is one of the best characterised of the more commonly found artefacts. It is the core from which a Levallois flake has been struck, and in its most typical form consists of an irregularly circular, lenticular mass, plano-convex in section (it may indeed be almost hemispherical), the flat face being really slightly concave, and formed in the main by the scar left by detachment of the flake; the periphery of this face commonly shows a certain amount of accessory flaking which serves to define the edge of the flake removed. The convex face is worked from the centre outwards so as to present a number of facets radiating more or less regularly from the summit of the nodule, a considerable portion of the outer crust usually being preserved. A notch at one portion of the periphery indicates the position of the point struck to remove the flake. Specimen No. 22, from the Sturge Collection, is the best example I have seen of this form of core; it is almost hemispherical and measures about 9×8 cm., being roughly 4 cm. thick.

Such typical specimens are not common; in its more usual form the core is so trimmed as to have very much the shape of the half of a somewhat flattened pear, the notch indicating the point at which the core is struck, being situated at the broad end of the pear. Such cores are not generally lenticular in cross section, the two surfaces being approximately parallel, probably because the pebble selected to form the core was flattened rather than spherical. In these cores, much of the back, *i.e.*, the surface opposite that from which the Levallois flake is struck, is represented by the original skin of the nodule of which, as already stated, the two major opposite surfaces were flat rather than domed. Specimens Nos. 26 and 27 illustrate these points; No. 26, from Thebes, is 9.5 cm. $\times$ 7.5 cm. and 3.5 cm. thick, while No. 27, from Abydos, is almost as long, and is not quite 2 cm. thick.

Comparatively few of these cores reach 10 cm. in length. On the other hand, so many are between 8 and 10 cm. that this almost seems to be a type length, and this especially applies to the cores that have been worked into tortoise points (*infra* and p. 126). The largest tortoise core I have seen from Egypt was collected by Mr. Murray on the Wady Dib site. It is 13 cm. long, 12 cm. at its broadest, and nearly 5 cm. thick; its flake bed measures nearly 11 cm. by 8 cm. I have not myself seen any flakes of this size, the largest I have handled is subtriangular, a trifle over 9 cm. long, and about the same breadth.

There are two implements which have been developed from the tortoise core. The first of these is the large hollow scraper, an extremely well defined form for which I suggest the term "crescent." The second implement is a heavy drawing or dragging point which is worked on the narrow end of the less domed tortoise cores and for which I propose the name tortoise point.¹

¹ Tortoise points not so much because they occur on tortoise cores, but because this stout, rather blunt point recalls the beak of a tortoise.

Although crescents are well known and have been figured by almost every writer on the stone implements of the Egyptian desert, and although Dr. Sterns has made the valuable suggestion that they are a local form limited to the Thebaid, their origin from the Mousterian tortoise core has not, I think, been noticed hitherto.

FIG. 1.—DIAGRAMS SHOWING MANUFACTURE OF CRESCENT FROM TORTOISE CORE.

Text-figure 1, (a) and (b) represent somewhat diagrammatically the two aspects of a tortoise core from the neighbourhood of Thebes, figures (c) and (d) represent the two aspects of a crescent, (a) and (c) show the convex surface with part of the original

crust left *in situ*, the dotted line in (a) marking off the area that has been broken away from the core to give the scraping edge of (c). Figures (b) and (d) show the plane surfaces of the two specimens, the arrow at (d) pointing to the single crescentic flake that in a number of these implements has been removed from the working edge, probably before the final touches were given to the opposite surface. These crescents vary somewhat in the accuracy of the flaking of the plane surface, as well as in the size of the crescentic flake removed from the working edge: often this extends from limb to limb, *i.e.*, forms the whole length of the working edge of the flake-bed surface, as in the two specimens figured here (Nos. 24 and 25).

No. 24, from the neighbourhood of Keneh (Sturge Collection), is, as far as form goes, a typical specimen, but its colour, greyish on one surface and grey-brown on the other, is unusual and indicates that it has weathered out of a gravel relatively recently (*cf. supra*, p. 120). No. 25, also from the Sturge Collection, is the only crescent I have seen that has been made from a Levallois flake (nor have I noted any other specimen in literature); it shows the usual brownish palæolithic patina and has a faceted butt.

With regard to the use of these crescents, it may be suggested that they were used to trim saplings and the branches of trees, and that their chief use was to fashion the shafts of spears, a suggestion that will, I think, be the more readily accepted by those who have watched a Melanesian smooth a spear shaft with the tusk of a wild pig, an implement having, as regards curvature, very much the working edge of these crescents. From one point of view No. 12 may be regarded as a much simpler form of crescentic scraper, but its colour and general appearance indicate that it is broadly contemporaneous with the carefully made crescents. In this specimen a large rough flake has been trimmed to crescentic form by the removal of a series of coarse flakes from one edge, the trimming being entirely at the expense of the inner surface of the flake (*i.e.*, that showing the bulb).

I have already alluded to Dr. Stern's suggestion that the crescents were a local form peculiar to the Thebaid. The occurrence of such rough but effective implements as that under consideration, and the fact that no crescent was found by Mr. Murray on his untouched sites in the Eastern Desert, go far to support Dr. Stern's view.

The tortoise point, the second class of tool which is typically derived from the tortoise core, is more difficult to describe. Regarding for the moment the face of the tortoise core, from which the Levallois flake is removed, as the upper surface, this tool consists in the production at its narrow end of an upturned point or beak. In its simplest form this is produced by the meeting at the narrow end of the core of the two planes bounding the flake-bed left by the removal of the Levallois flake, and of a facet constituting a third plane joining these at an angle, produced by striking off a flake from near the point of the lower (convex) surface of the core. It follows that the point or beak should be triangular in section, as it actually is in many instances, while in others it is somewhat pyramidal owing to secondary flaking, *i.e.*, in those

instances in which the operator did not succeed in removing one sufficiently large flake at a single blow.

Text-figure 2 will serve to make this description clearer. The upper figure represents somewhat diagrammatically the face of a tortoise core such as is represented in Nos. 23, 26 and 27. It will be noted that the lower part of the scar-bed (F) of the Levallois flake is bounded by two longer, narrower facets (lettered 1 and 1a), and their intersection gives rise to a crest or ridge. This crest (R) and its two bounding facets are terminated abruptly by the facet numbered 3

FIG. 2.—DIAGRAM INDICATING MODE OF MANUFACTURE OF TORTOISE POINT.

produced by a blow struck on the opposite surface of the stone. This is shown diagrammatically in the lower figure, which represents an end-on view of the "point." Nos. 26 and 27, which are drawings of actual implements, show that instead of one blow to produce the terminal facet, a good deal of retouching was sometimes necessary. Text-figure 3 is a dorso-lateral view of a specimen in the Sturge Collection, uncommon in that the "point" has been worked on an unusually well-domed tortoise core. The actual point is well shown as well as the minute irregularities in the crest immediately below it, due to use.

The form of these "tortoise points," as I propose to call them, indicates that they were used as a heavy drawing point, *i.e.*, with a drawing or dragging motion while the hand exerted considerable pressure. In a certain number of examples the distal portion of the crest, that nearest the point, shows minute abrasions, additional evidence in support of the suggestion that this implement was used with a drawing motion, considerable pressure being exerted at the same time. The only grip allowing this is that shown in Fig. 1 of Plate II, the base of the stone being gripped between the bent fingers and the ball of the thumb and drawn steadily away from the body,

FIG. 3.—TORTOISE POINT IN DORSO-LATERAL VIEW.
Sturge Collection. $\times \frac{1}{2}$.

the implement itself being but slightly inclined to the surface it is desired to cut. The suggestion may be made that these tools were used for cutting hides; such a point would furrow or cut a stiff sun-dried hide—as those used by the Veddas—just as it does a piece of stout millboard. Fig. 29 illustrates a specimen in which the point and crest have been extremely worn by use.

This form of implement has not, so far as I can discover, been recognised in Europe hitherto; it is probably uncommon, but that it exists is suggested by the

reproduction by Commont¹ of figures of two “instruments moustériens” from St. Acheul, of which one at least seems to represent the “new” implement.

Although the great majority of tortoise points were worked on tortoise cores, as in Nos. 26 and 27, the “new” tool also was at times made independently. No. 28 represents a typical tortoise point worked on the end of an elongated somewhat bi-lobed pebble, only so much of the crust having been removed as was necessary to produce the implement. A carefully made tool from the Wady Dib shows a form and technique suggesting its relationship to the tortoise core, but also that it was made by an expert who felt no necessity to conform closely to the type, while No. 30 shows the “point” reduced to its simplest terms. An oval nodule has been split longitudinally and roughly worked on its broken surface to produce the necessary converging facets at one end, a single flake was then removed from the natural rounded surface, the whole of the rest of the skin of the nodule being retained.

I have already stated that I regard the Mousterian technique of Egypt—perhaps this applies to the whole of North Africa—as having developed farther than in Europe. In no feature is this more obvious than in the development of the tanged spear or arrow-head.² No. 31 represents a thick heavy point of greyish colour (marbled) from the gravels of Sheikh Moussa. It is a somewhat unusually well-shaped piece for Egypt, but apart from the condition of its proximal end it does not differ greatly from such typical Mousterian implements as Nos. 7 and 18. Yet the working at this end entirely alters its character, for it indicates a short broad tang, to produce which the dorsal aspect of the flake for the proximal fifth or sixth of its length has been broken away, so as to produce a less thick base, while the edges of the stone have been trimmed as nearly as possible symmetrically to assist in the production of this peduncle or tang. On the ventral surface the bulb of percussion has been removed almost entirely.

The next specimen, No. 32, from the Sturge Collection, is a longer, narrower point with a tang which occupies nearly a third of its length; the base of the tang is oval

¹ Commont, *op. cit.*, Fig. 59.

² With regard to the classification of these tanged points as Mousterian, there is evidence from other sites pointing in the same direction. Mr. Burkitt tells me that M. Peyrony has recently found a tanged point of undoubted Mousterian date at La Ferrassie in the Dordogne. Turning to Africa, the Abbé Breuil writes me that in Algeria, Monsieur M. Reygasse has found a Mousterian industry, including tanged points (*points pedunculés*), associated with a definitely palæolithic fauna, and underlying a thick bed of alluvium. Moreover, M. Breuil regards a whole series of tanged arrow heads from sites in the neighbourhood of Tabelbala oasis in Southern Morocco (29° N. Lat. and 6° W. Long.) as of Mousterian date. The industry, as he writes me, includes discs, flakes, points, scrapers, coarse blades of Mousterian appearance, and also large pedunculated points or scrapers, occasional burins and a few broad and long laurel-leaf blades. M. Breuil considers this industry as “une industrie Moustérienne évoluant au Solutréen.” For some account of these tanged points cf. R. Tarel, “Gisements préhistoriques de l'oasis de Tabelbala,” *Revue Anthropologique*, vol. xxiv, 1914, pp. 312–355. I have seen and handled many of these points, and I venture to say there can be absolutely no doubt as to their being arrow-heads or the points of light spears, the date being the only matter that can be open to discussion.

in section, the proximal end of the blade, including the bulb of percussion, having been carefully worked to this form; the colour of the specimen is medium brown with a lustrous surface, and though Dr. Sturge bought it in Luxor, I fully agree with him that it is a surface piece from the high desert. No. 33 represents a smaller point picked up by myself on the high desert near Abydos, at a height of about 700 feet. It is obviously a spear or arrow-head destined to be tanged, but with only the beginning of the tang actually formed; the edges have been worked away symmetrically towards the base, and the thickness of the blade immediately distal to the butt has been reduced by one or more blows delivered at opposite but corresponding points on each side of the butt. The specimen is of a medium brown colour, and has a lustrous surface.

In both these points the full longitudinal curvature of the flake from which they have been fashioned has been preserved, no attempt having been made to lessen this by under-trimming the point of the blade. All three specimens present the faceted butt.

I may here refer to another smaller point, also with faceted butt, with one side trimmed away symmetrically just above the butt, with a natural concavity on the opposite side. A small portion of one edge of the flake has been trimmed away from the under (bulbar) surface. This specimen, No. 34, is of a dark brownish-red and was found on the plateau above Thebes. If not itself an arrow-head it is at least a form from which the latter might easily be derived.

The point from the high desert at Thebes reproduced as No. 35 is provided with a broad roughly-worked lateral tang, produced by trimming away one edge towards the base so as to give rise to a definite shoulder. Apart from this, and the more careful working of its pointed extremity, this implement is of much the same character as regards size and weight as No. 31. That such shouldered points represent a definite type seems to follow from the fact that there is a similar though slightly larger specimen with precisely the same working of the tang (but with the point broken off) in the Peabody Museum (Harvard).¹ This has been figured by Dr. Sterns, and a tracing from his photograph with the missing part indicated is given here for comparison.

It will be noted that the Mousterians of the Thebaid showed considerable eclecticism in their attempts to produce tanged points. Even if No. 32 be regarded as Capsian, Nos. 31 and 35 are clearly independent of each other genetically.

Capsian Forms and Forms Transitional to Capsian.—It has already been mentioned that relatively long narrow "points" such as those illustrated in Figs. 5 and 6 occur much more frequently than in the Mousterian of Western Europe. Whether these be regarded as themselves evidence of Capsian influence, or as a useful variation which arose in the Mousterian culture apart from foreign influence, it can scarcely

¹ *Op. cit.*, Pl. X, Figs. 69 and 70. With the point missing, this form of implement might easily be regarded as a large hollow scraper.

be doubted that their existence would make easier the passage to full Capsian types. A long point with trimmed edges might easily give rise to such a blade as No. 36, with a point that is almost a borer. Nor should it have been difficult to arrive at a beak-ended specimen. Again, such a long narrow blade as No. 37, with one edge definitely trimmed, the other, and especially the distal end, showing signs of wear, is not very far from an end-scraper, a rough hollow-ended end-scraper (as No. 38), or even a transverse end-scraper (No. 39). Another possible mode of origin would be by the retouching of a long narrow point which had been broken across transversely. Such, indeed, may have been the mode of production of No. 40, an end-scraper of light grey colour, removed from the hard cemented gravel slightly above 'Elwa el Dibban. The more typically Capsian implements include end-scrapers on long flakes with trimmed edges (Nos. 41 and 42), nose end-scrapers (No. 44), and blades termi-

FIG. 4.—SHOULDERED POINT.
Peabody Museum. $\times \frac{2}{3}$.

nating in a beak which recalls a *burin* (No. 45), though morphologically it is not one. Notched forms also occur; No. 46 represents a transverse end-scraper with two opposite lateral notches, while the small implement reproduced as No. 47 presents three notches, the third being produced by inverse flaking on the opposite face to that drawn. Less typical are such asymmetrical end-borers as those shown in Nos. 48 to 51. These present boring points situated asymmetrically at the end of flakes with trimmed and notched edges.

III.

Apart from the suggestions offered by the form of the stones themselves, what evidence is there that these implements are of palæolithic date? Clearly the evidence

may be sought in three directions, viz. :—(1) the discovery of implements associated with the remains of an extinct fauna, or ancient type of man ; (2) the discovery of typical implements *in situ* in strata of determinable pleistocene age ; (3) the implements themselves may present a type of work which, in Europe, is only found in artefacts of a particular palæolithic age. It is obvious that the last criterion is not an absolute one, and arguments based on it alone might be upset at any time by the discovery of post-quaternal implements showing the particular type of work. Nevertheless, in the present stage of knowledge it cannot be ignored, and I shall later return to it with the reservation above stated. No discovery of the type referred to in (1) has yet been made in Egypt, but with regard to (2), the existence of implements in undisturbed gravels of pleistocene age, I hope to show that this condition has been fulfilled.

As the evidence for the existence of palæolithic implements in pleistocene gravels is derived from the neighbourhood of Thebes, it is necessary to give a brief account of the geography, and, as far as I am capable, of the recent geology of the district.

The valley of the Nile in the neighbourhood of Thebes consists of an alluvial plain some 10 kilometres wide, from which rises the limestone plateau of Lower Eocene age¹ which constitutes the greater part of the Western Desert. Between the alluvium and the slopes of the plateau there lies a belt of sands and gravels of Pleistocene age, consisting of wash from the plateau and its foothills.

The edge of the plateau, and the more recent deposits between it and the alluvium, are cut across by numbers of wadys, only the most important of these being shown on the sketch map,² where they are indicated diagrammatically. The general character of the edge of the plateau, the lower courses of its wadys, and the gravels deposited beyond the wady mouths are shown in the photographs reproduced in Plates III and IV, which were taken to show as much as possible of the ground worked over, including the lower part of the great wady locally known as Wadyēn, literally “the two wadys.” This is formed by the confluence of two main affluents, a southern coming from the valley of the Tombs of the Kings, and a northern “draining” a wide area to the north, including the slopes of Thoth Hill. The two wadys meet and fuse under the western flank of the low isolated hill called ‘Elwa el Dibban,³ above which its banks soon become low cliffs some 10 feet high.⁴

Above this the younger gravels give place rather abruptly to older deposits of the same general character but of much greater depth, so that about a mile and a half above ‘Elwa el Dibban the banks of the wady are some 200 feet high, formed of

¹ This is not absolutely accurate ; there is exposed in this area a narrow belt of limestone of Cretaceous age, underlying the Eocene.

² Slightly modified from Schweinfurth’s map 1 : 25,000 (Berlin, 1909), which is itself based on Wilkinson’s map of 1830, and the Cadastral Survey of 1904.

³ In the map this hill appears as larger, higher, and altogether more important than it really is.

⁴ It should be noted that this and the following remarks refer only to the northern or main affluent ; I have not examined the branch from the Tombs of the Kings.

irregular bands of gravel and finer material, described by Dr. Hume as “inter-bedded conglomerates and marls and limestones and clays, near base much false bedding.” These gravels apparently cease at an elevation of about 300 feet above the cultivation, and certainly the high terrace (*cf. infra*) is formed of older material.

Dr. Hume recognizes three terraces :—

(A) A high terrace several hundred feet below the main scarp of the plateau, consisting of reassorted marls and coarse gravels. In the valley immediately to the north of the valley of the Tombs of the Kings this terrace is 112 metres above present Nile level. Upon the surface of one of the tongue-shaped projections of this terrace into the Wadyēn (Plate IV, Fig. 2) were found flints of Mousterian type showing the characteristic palæolithic patina, the presence of hammer stones, cores and flakes in immediate relation with each other seeming to indicate the presence of an actual chipping place.

(B) A middle terrace constituting a broad plateau which at the point where measured is some 88 metres above Nile level. On its surface are many patinated implements, often occurring in patches. This terrace sends out broad spurs into the plain.

(C) The middle terrace, a low-level terrace “occupying the valley from a line about one kilometre east of the limestone marl bluffs [the high terrace] to the borders of the cultivation, and also extending far up into the narrow valleys which have cut their way through the limestone marl terrace. . . .”¹ This terrace is noted by Dr. Hume as being some 53 metres above Nile level where observed. It is in the gravel of this terrace that the greyish unpatinated implements so often referred to in this paper were found *in situ*. From a sketch map sent me by Dr. Hume it would appear—the responsibility for these deductions is entirely my own—that the implementiferous gravel immediately above 'Elwa el Dibban is very roughly some 40 metres above present Nile level, while the height above Nile level of the Sheikh Moussa gravel may be something less than half of this.

Working from the edge of the cultivation towards the desert, the modern burial-ground of Qurneh, known as Sheikh Moussa, occupies part of the wide embouchement of the Wadyēn, which has here cut its way through a firmly cemented gravel so hard that it is with difficulty that its elements can be chiselled out. This gravel forms a definite wall or cliff on the western side of the wady, honeycombed with rock tombs of the dynastic period, whose smooth facings and sharply defined edges bear testimony to the hardness of the gravel in which they are cut. Then comes the confluence of the two main constituent wadys already mentioned, the northern affluent passing under the flank of a peninsular outlier of the much dissected thick gravel deposit which forms the edge of the high desert. This outlier, which may be called Pyramid

¹ This quotation, as well as the other statements concerning these terraces, are taken from the MS. of “A Preliminary Report of the . . . Terraces of the Thebes Area,” which Dr. Hume most kindly sent me and which will, it is hoped, be published in *The Geological Magazine*.

FIG. 5.—SKETCH MAP OF WADYEN AND NEIGHBOURHOOD.

Hill, is a projecting tongue of the older but still pleistocene deposits already referred to as reaching a thickness of some 200 feet, a portion of which is shown in Plate IV, Fig. 1. The hill bears on its "neck" a mud hut, said to be an old look-out station (called "ancient house" in the sketch map). These landmarks and the general character of the country are well shown in a photograph reproduced as Fig. 1 of Plate III, taken from a position somewhat to the south-west of the mud hut. This shows the old look-out house (marked on sketch map and also shown in Text-fig. 6) and beyond it Pyramid Hill, which partly masks the smaller distant mass on the left bank of the wady, which is 'Elwa el Dibban. The dark line in the distance represents the cultivation, a light streak in its midst indicating the Nile.

From Thebes to Qamuleh, a distance of some eight miles, the geological map shows a breadth of five to six miles of pleistocene deposit between the alluvium and the edge of the limestone. East of the Wady Khalifeh the country presents a vast gravel flat intersected by old stream beds with low gravel banks. These banks contain more sand than at Thebes and are far less firmly cemented. Farther up towards the hills are masses formed by the dissection of a somewhat higher plateau.

Of the Wady Khalifeh itself it was only possible to make a rapid examination of the lower portion; here its banks are formed of gravel which ceases farther up, except as a central deposit, filling up the floor of the wady in which streams have cut smaller banked courses. It seemed clear that the big lateral gravels are older than the central gravel, and their appearance suggests that they had been sculptured to substantially their present form before later detrital gravels partially filled up an originally deeper wady (carrying down with them the whitish palæoliths which are now to be picked up in the wady bed).

The first artefacts were found *in situ* in the miniature cliffs, 8 to 10 feet high, which form the banks of the wady above 'Elwa el Dibban; later specimens were found in the cliff edge forming the boundary of the Qurneh burial-ground—it was here that Pitt Rivers discovered humanly worked flakes in 1882¹—and also in the gravels behind Qamuleh, some eight miles north of Thebes. Although by prolonged examination it was possible to find artefacts in all these gravels, it soon became evident that even weeks of search would yield only a small number of worked implements of definite type, and as soon as implementiferous gravels had been found and the definite character of the surface—white or greyish—of the implements they held established, the laborious task of scanning every inch of the gravel face was given

¹ *Op. cit.*, pp. 389–392. These specimens are now in the Pitt Rivers Museum, Farnham, Dorsetshire, where I have been able to examine them. Taken by themselves it is probably true to say that not one of them is sufficiently well made to permit of the statement that it is of a definite type. But coming from a gravel of admittedly Pleistocene age, one specimen, that represented in Fig. 25 of Plate XXXVI, must be regarded as a very rough Drift form, while one of the flakes (Fig. 23, Plate XXXV) appears to present the remains of a faceted butt, and may be considered to be Mousterian.

up and a careful search made for worked stones with similar whitish surface among the debris that had accumulated at the foot of the cliffs forming the banks of the wady. Here were found a considerable number of implements, flakes, and cores, which clearly had slowly weathered out of the cliffs and fallen to their bases, where they had remained undisturbed.

The old estuary of the wady, now the broad gravel surface at Sheikh Moussa in the neighbourhood of the modern burial-ground, was also searched with good results, and so many implements were collected that it became possible to appreciate the gradually darkening coloration, and to state that the gravels contained hand-axes of Drift type, although no hand-axes were actually found *in situ* in the gravels.

This was the position, as I knew it, in the early part of this year (1921), when

FIG. 6.—CLIFF FACE BELOW OLD LOOK-OUT HOUSE (7 ON MAP, P. 133),
SHOWING POSITION X IN WHICH HAND-AXE WAS FOUND.

Mr. Smith drew my attention to a number of specimens presented to the British Museum by Mr. Montague Porch, removed by himself from the cliff face of the north bank of the northern affluent of the Wadyēn, immediately below the old watch-house. Among these is a typical hand-axe (B.M. 1919, 12-27, 68) with greyish-white surface, while the photograph of the site which accompanies the specimens indicates that the level at which these were found is about one-third up the cliff face. Fig. 6 is a rough sketch (from Mr. Porch's photograph) showing the position in which this important specimen was found.

At this point it will, I think, be convenient to give lists of implements of definite typological form found *in situ* in the gravels, and of those of definite types, the appearance of which showed that they had but recently weathered out, found in wash-outs or banks of wadys.

In situ in gravels :—

Chelles hand-axe (Mr. Porch's specimen).

Levallois flake with trimmed edge.

(Plate I, Fig. 2.)

Massive Mousterian point (No. 8).

Massive Mousterian scraper (No. 13).

Tortoise core. (Plate I, Fig. 1.)

Transverse end-scraper (No. 40).

Flakes with notches (Nos. 21, 47).

Recently weathered out :—

Chelles hand-axe (No. 1).

Rough hand-axe of Drift type.

Mousterian point (Nos. 7, 18).

Mousterian point, ? spear-head (No. 5).

Mousterian side-scraper.

Tanged Mousterian point (No. 31).

Asymmetric end-borer (No. 51).

Apart from Mr. Porch's hand-axe, the above refer entirely to my own finds ; to them should be added, in untouched gravels, two tools of hand-axe type and a nucleus, probably Mousterian, found by Petrie¹ in a bed of gravel at the foot of the cliffs at Naqadea at depths respectively of 2, 3, and 5 feet. The specimens found by Pitt Rivers² and now at Farnham, though less typical, may also be referred to here, while among specimens recently weathered out of gravels should be included a remarkably fine Chellean hand-axe with the point missing, slightly rolled, with chalky-white surface in the London University Collection (University College), and a coarser specimen more rolled, with similar surface as regards colour, bought by myself at Luxor.

The geological age of the gravels of Sheikh Moussa and the Wadyēn seems incontestable ; not only are they shown on the geological map as of Pleistocene age, but my friend Dr. Hume, Director of the Geological Survey of Egypt, went over the ground with me and confirmed my belief that the white gravels in which flakes were found *in situ* were pleistocene, as also are the gravels forming cliffs some 200 feet high farther up the wady, though these are older. Both are made up of fragments of still older gravels and contain *Lucina Thebaica*, the typical Lower Eocene fossil of these parts. It follows that the scrapers and points and nuclei discovered in these gravels are also of Pleistocene age, and as many of them are similar in form and of identical technique with Mousterian specimens from Western Europe, there remains no doubt that these implements are of palæolithic age, and it may be inferred that the gravels in which they are found were deposited at a period corresponding roughly to the Mousterian of Europe.

As already stated, implements of both River-drift and Mousterian technique are found at every height on the desert. With few exceptions these are lustrous (but not glistening), of a deep brown, brown-red or mahogany colour, or of a tinge of

¹ *Op. cit.*, p. 61, Figs. 5, 6 7.² *Supra*, p. 115, footnote.

orange flecked with black. The few exceptions which are of, or approach, the whitish colour of the specimens from the wady gravels, are simply to be regarded as elements of the great wash-outs which have from time to time scoured the beds of the wadys and valleys. Neglecting these, an attempt must be made to deduce the natural history of the more darkly coloured implements.

So far as I am aware, the patination of Egyptian implements has hitherto only been studied by my friend Mr. C. T. Currelly. A tentative account, too short to be of much value, appeared in the *British Association Reports* for 1908,¹ and, as he informs me, the whole question was to have been dealt with in the Introduction to that volume of the *Cairo Catalogue*, which deals with the stone implements in the Museum. Unfortunately, the volume was allowed to appear without the Introduction, so that for each stone the reader is faced by a number corresponding, as will be explained immediately, to a colour or shade of patination without the slightest indication to what this refers. I am indebted to Mr. Currelly for allowing me to give the following short supplementary account of his investigations. A series of fourteen distinct colours was selected, the deepest being called 1 and the lightest 14. "The sequence was easily seen, and to make sure, I hunted for many doubly patinated pieces, where an implement had been picked up and broken in a later period, and in a few cases an old implement picked up and reworked." The collection, a large one, brought together by Dr. Sturge and Mr. Currelly, "was then arranged in types and examined to see through what patinas the different types ran." It was found "that the forms agreed entirely with the French classification gained from geological position. I have since gone over some thousands of specimens and have not found one that breaks loose from this patina classification." Mr. Currelly then proposes a chemical explanation of patination which approaches closely that set forth on p. 139, and continues: "The flint gradually darkens till it becomes black, but remains rather glossy. It then breaks to a very light ochre, and that ochre becomes redder and redder till it becomes in turn almost black, now with an ochreous, non-glossy, but not powdery texture."

Something has already been said as to the predominant colours of implements from the Egyptian desert, and it has been noted that a certain number of uncoloured or lightly coloured specimens of every type occur (thus the Drift specimen No. 1, is dull white in colour, and another specimen has a matt surface of a deep greyish-black colour), so that it seems certain that Currelly's scheme will not hold without the qualification that it applies only to surface pieces, for it is obvious that an implement which has but recently weathered out of a gravel, and is of a greyish-white colour, might be of a totally different colour if it had weathered out five or seven thousand years ago. Whether his scheme—when the details are published—will prove applicable to the great majority of surface pieces is another

¹ "A Sequence of Egyptian Stone Implements." *Report of the British Association*, 1908 (Section H).

matter ; it is, however, probably true to say that most Mousterian pieces have a less archaic-looking surface than have many implements of Drift type. I am not competent to express an opinion as to the validity of his division of hand-axes into seven forms, nor, in the absence of the letterpress of the *Catalogue* has he had an opportunity of defining them. Apart from this refinement it will be seen that, excluding implements of Drift type, which run from 1 to 7, the remainder, with the single exception of "flat discs," occupy almost the whole scale from nearly the darkest to almost the lightest colour.¹

As already stated, implements found *in situ* in gravels have always been of a greyish colour, often irregularly marked, the surface appearing mottled or marbled. Specimens from the wady floor, *i.e.*, which have weathered out of the gravel comparatively recently, may present this colour or may darken to a violet-black colour, but such pieces never present the browns and red-browns with the sub-lustrous or lustrous surface of implements from the plateau or its exposed slopes. These qualities are only found in flints that have lain long in the open, and this immediately suggests that the rays of the sun are at least in part responsible for the condition, the change in the main being effected by light and (or) heat. If the discoloration be in the main due to light, there should be little chemical difference in the constitution of the coloured surface-layers and the main body of the flint ; if, on the other hand, the sun's rays have set up a physico-chemical change, then the composition of the coloured skin-layer should be different from that of the white or greyish interior of the flint. This is actually the case : the lustrous surface of the flints clearly indicates a physical change, while analysis shows that a chemical change has also taken place.

I am greatly indebted to Miss Katherine Burke for information concerning the chemical composition of a number of these implements. Examining first specimens from Thebes and Abydos, with typical brown-red surface, she found that the colouring matter is mostly iron, in some specimens manganese is also present in relatively small amount, while there may be an external deposit of carbonate. The next step was to cut out pieces from the centres of two specimens, one from the Eastern Desert with deeply-coloured surface, the other from the floor of the Wadyên at Thebes, of a whitish-grey colour throughout. The coloured superficial layer of the specimen from the Eastern Desert contained the usual comparatively large amount of iron. Examination of the central portion of the two specimens showed that both contained about the same relatively small amount of iron, and that neither contained manganese. The surface piece contained little carbonate, while the piece from the wady floor contained a relatively large amount.

The oxides of iron and other elements which give rise to the dark-coloured lustrous surface can only be derived from the interior of the flint, more correctly chert, whence they have been carried to its surface by water in the form of soluble salts. Even

¹ Brit. Ass. *Report*, 1908, *loc. cit.*

allowing for the spongy structure of chert, it does not seem probable that the stone itself contains enough water to carry the amount of mineral substances necessary to form the crust; rather, I think, must occasional showers and dew be considered to play a necessary part in the process.¹ It is not suggested that the amount of moisture deposited on the surface of the stone itself, already somewhat coloured and therefore only partly permeable, is sufficient to dissolve and re-deposit all the mineral matters in the flint, rather should the implement and the ground underneath it be considered to constitute one system. The sun will rapidly dry its surface and the ground around it, but the flint will minimise evaporation from the ground immediately beneath it, and as the fluid it contains is removed from its upper surface by evaporation a certain amount of water from the relatively damp layers beneath it will pass through the cooler lower surface of the stone; this water will diffuse gradually upwards into the substance of the flint, and in time through it, depositing the salts it has taken up on the upper face, and so darkening the colour of the surface deposit. The fact already noted, that in most of the implements under discussion one surface is lighter than the other, and that this is always the lower surface, seems in favour of the view advanced; also that the colour can gradually be seen spreading round the edge of the flint from the upper to the lower surface. That the water concerned in this process is the result of atmospheric precipitation *in situ*, and is not supplied by the constant rising to the surface of capillary water from any great depths, at least in recent times, is, I think, obvious from the following considerations. The Tombs of the Queens are driven into the solid limestone at a height of some 80 metres (262 feet) above local Nile Valley. The desert in this neighbourhood is, or was, so well provided with flint implements that they have been picked up actually above the tombs themselves. The paintings in these tombs are as perfect and probably as bright as on the day they were sealed up, which shows that there was no movement of water laden with salts through the mass of the rock; had such occurred

¹ As to the occurrence of dew in the high desert, the experience of Mr. John Ball, of the Egyptian Survey, who writes as follows, seems conclusive:—"My wanderings in Egypt and Sinai enable me to state that there is no portion of these deserts in which dew-falls do not occur in the winter months. The falls are heaviest and most frequent near the Nile Valley and the sea, and rarer and less heavy in the tracts removed from water, especially on the Libyan plateau. But even in the heart of the Eastern Desert, especially among the mountains, heavy dews occur; I have observed, for instance, a litre per square metre to fall in a single night at Gebel Niqrub, over 200 kilometres from the sea. And my observations in Sinai agree with those made in 1868 and 1869 by Captain Wilson, who records that in 'December and January heavy dews at night are frequent.'"—*The Geography and Geology of West Central Sinai* (Cairo), 1916, pp. 178, 179.

On this matter I may also quote Mr. H. Knox Shaw, of the Ministry of Public Works (Cairo), who has written to me as follows:—"Dew certainly occurs in the high desert, even quite far south and in considerable quantities . . . occasional torrential rains must occur in the desert away from the Nile as well as in the valley itself, being entirely independent of the river valley, but they would be very rare in any particular spot."

there would have been an efflorescence of salts on the tomb walls, and the paintings must have been destroyed.¹

It is to be inferred that the iron deposit on the surface of the flints must have come from the more superficial layers of the soil, and that the soakage from the Nile never reached high enough to be carried to the surface of the plateau ; while it seems equally clear that there was never enough surface condensation to penetrate the limestone to the depth at which the tombs were cut.

At this stage it is convenient to refer again to Miss Burke's analyses, the results of which can be presented in tabular form as follows :—

Surface Piece.				Piece from Wadyēn Thebes.
Colour of surface	..	Dark reddish-brown	..	Greyish.
Colour of interior	..	Greyish-white	..	Greyish-white.
Iron in surface layer	..	Abundant	..	Absent.
Manganese in interior	..	Absent	..	Absent.
Iron in interior	..	Trace	..	Trace.
Carbonate in surface layer	Trace	..	..	Present in relatively large amount.
Carbonate in interior	..	Trace heavy	..	

It will be seen that the results of analysis are just those demanded by the hypothesis put forward ; the relatively large amount of iron in the exposed implements is the result of the repeated evaporation on the surface of the flint of small quantities of water containing iron salts in solution, while the large amount of carbonate in the uncoloured specimen from the wady floor may be considered as the result of absorption of lime from the lime-laden waters. These must have percolated through the gravels for relatively long periods to cement them into the hard calcareous mass they present to-day, or else the carbonate is to be regarded as due to lime in the original chert nodule from which the implement was made. In favour of this latter view is the fact that the centre of a chert nodule removed from the country rock by Mr. Murray (in Sinai) contained a large amount of carbonate.

With regard to the time necessary to produce the palæolithic patina, some indication is afforded by the implements from the Wady Sheikh, the great centre of manufacture of flint implements in protodynastic times (using the term protodynastic in a broad sense), and from a mound not far distant marking the site of the wharf at which the implements were shipped for transport up the Nile. I hope to describe this elsewhere, meanwhile it may be noted that the mound yielded blades and cores of the unaltered milky white colour of the tabular flint (or rather chert) from which

¹ The same argument applies to the Tombs of the Kings ; the valley immediately north of the valley of the Tombs of the Kings is 367 feet above Nile level, the nearest point on the plateau above the Valley of the Kings is 706 feet above local Nile level. I am indebted to Dr. Hume for these figures.

the implements were made, while the Wady Sheikh pieces, which had been lying on the surface of the desert for at least some five to seven thousand years, do not present a palæolithic patina, but are often blackish, never, as far as I have observed, showing the characteristic red-brown shades of colour and certainly lacking the typical lustre.

The condition of what is now the high desert, at the time when man was producing implements of the types recovered from the gravels, is a matter of great interest. In this country it has generally been held, at least by archæologists, that the plateau was forest-covered, but Mr. H. J. L. Beadnell, a geologist of much Egyptian experience, has tentatively put forward the opposite view,¹ which is also that taken by Walther,² one of the most recent writers on desert conditions. It is dangerous to draw deductions from negative evidence, and Murray's recent discovery of large numbers of implements at Hammama and other sites in the Eastern Desert indicates that there were sites on which implements were made in large numbers at such distances from the Nile, and, under present conditions, from any water supply, that it must be agreed that the full desert conditions which now prevail did not do so then. It is not necessary to postulate the existence of dense forests—their presence would indeed scarcely have been favourable to palæolithic man—rather may we imagine grassy uplands such as to-day form the indeterminate southern edge of the Eastern Desert, *e.g.*, in the neighbourhood of the boundary between the Sudan and Eritrea, and wide areas of open scrub country such as is to be found bordering the Upper Nile directly the marshy riveraine zone is passed, and also in southern Kordofan.

This, then, was the character in Pleistocene times of what is now the desert plateau. With regard to its incline towards the valley and the greater wadys, it must, I think, be agreed that the main earth-sculpture of its slopes had taken place before Middle Pleistocene times, *i.e.*, allowing for surface denudation, the halfway terrace and the main water-courses existed then in much the same condition as they do now. This seems indicated by the implementiferous gravels, which in certain instances

¹ Mr. Beadnell (*Geological Magazine*, 1903, p. 58) says:—"The presence of worked flints lying scattered around the centres where they were actually worked does not necessarily prove that the plateau was inhabited by man. If early man could obtain better material there than elsewhere . . . he would naturally have manufactured his implements there. Most, or all, these implements are found near the edge of the plateau at no great distance from the valley, and even under the present rigorous desert conditions I have frequently found Fellahin from the valley up to thirty and forty miles inland remaining for days away from the habitable cultivation working small veins of rock-salt or gathering bats' dung in caves. In exactly the same way may early man have gone into the desert to obtain and work his flint . . . If the plateau was really vegetated and habitable, how is it that no traces of man are found at any distance from the Nile Valley? I have crossed the Libyan Desert and traversed a good deal of the Eastern plateau, but never met with any remains of early man or anything to suggest that either plateau might have been habitable, even in very remote periods.

² *Das Gesetz der Wüstenbildung* (Leipzig, 1912), p. 149.

appear to have in part filled in the beds of older water-courses, as well as by the occurrence of the equally deeply patinated implements alike on the plateau and the major and minor terraces.

IV.

The following conclusions seem justified :—

Typological.

(1) Besides the well-known implements of River-drift and Mousterian types, forms transitional to the Capsian and fully Capsian, though relatively few in number, are to be found on the surface of both the Eastern and Western Deserts.

(2) Forms transitional to the Capsian and fully Capsian include end-scrapers, transverse end-scrapers, nose-scrapers, notched end-scrapers, and some tanged points.

(3) The form of tortoise-core commonly found in Egypt is unlike the usual European type, and is often specially worked to form an implement having a heavy triangular or pyramidal point. This tool must have been used with a drawing or dragging motion. The same point, which it is proposed to call a "tortoise point," is sometimes produced apart from tortoise-cores.

(4) A number of rough tanged points (spear or arrow-heads) have been found. Some of these appear to be definitely Mousterian.

(5) No implements of Solutrian or Magdalenian type were found among the large number of specimens collected from the high desert and its terraces.

Stratigraphical.

(6) The great majority of implements of all three types—River-drift, Mousterian, and Capsian—present a characteristic surface, and a series of shades of colour (palæolithic patina), found only in specimens which have long been exposed on the face of the desert.

(7) Implements of a highly developed Mousterian type, which do not present the palæolithic patina, are found *in situ* in undisturbed gravels geologically of Pleistocene age.

(8) Numerous implements of Mousterian type, and a few of River-drift and Capsian types, which do not present the palæolithic patina, but which resemble the specimens found in undisturbed gravels, are to be found at the base of the cliffs bounding the wadys, indicating that they have weathered out relatively recently from the gravels forming these cliffs.

IMPLEMENTS FIGURED ON PAGES 145 TO 153.¹

1. Large hand-axe, white porcellanous surface, Thebes.
2. Hand-axe with borer point, Hammama.
3. Finely worked ovate, Mahamid.
4. Prismatic hand-axe or pick, Sturge Collection.
5. Long and narrow blade (spearhead ?), Thebes.
6. Mousterian point (spearhead ?), Thebes.
7. Mousterian point, Thebes.
8. *Heavy Mousterian point*, Thebes.
9. Mousterian point, Thebes.
10. Mousterian point, Thebes.
11. Mousterian scraper, Thebes.
12. Mousterian side-scraper, Thebes.
13. *Coarse Mousterian scraper*, Thebes.
14. Levallois flake, Sturge Collection.
15. Flake with borer point, Thebes, Sturge Collection.
16. Borer, Thebes.
17. Finely worked scraper.
18. Mousterian point.
19. Heavy side-scraper bearing three notches, Thebes.
20. Notched flake, Thebes.
21. *Notched flake*, Thebes.
22. Typical domed tortoise-core, Sturge Collection.
23. Tortoise-core, Thebes.
24. Crescent, Keneh, Sturge Collection.
25. Crescent (worked flake), Sturge Collection.
26. Tortoise point, Thebes.
27. Tortoise point, Thebes.
28. Tortoise point on roughly bi-lobed pebble.
29. Tortoise point, extremely worn by use, Thebes.
30. Tortoise point, roughly worked on split pebble, Thebes.
31. Mousterian point with short stout tang, Thebes.
32. Tanged point, Sturge Collection, Thebes.
33. Point with beginning of roughly worked tang, Thebes.
34. Point, perhaps showing beginning of tang.
35. Shouldered point, Thebes.
36. Long flake with trimmed edges, worked to point, Thebes.
37. Blade with edge trimming and signs of wear on other edge and distal end, Thebes.
38. Hollow ended end-scraper, Thebes.
39. Transverse end-scraper.
40. *Transverse end-scraper*, Thebes.
41. End-scraper, Thebes.
42. End-scraper, Thebes.
43. End-scraper.
44. Nose end-scraper.
45. Beaked blade.
46. Transverse end-scraper with opposite lateral notches.
47. *Small implement with three notches*, Thebes.
- 48-51. Asymmetrical end borers with trimmed and notched edges ; Nos. 48, 50, and 51, from Thebes, No. 49 from Wasif.

¹ All drawings are reproduced $\times \frac{2}{3}$; implements numbered 8, 13, 21, 40, and 47 were found *in situ* in gravel.

- Plate I. Fig. 1.—Tortoise-cores from high desert and from cemented gravel.
Fig. 2.—Levallois flakes from high desert and from gravel.
- Plate II. Fig. 1.—Supposed method of holding and using tortoise point.
Fig. 2.—Hard cemented gravel forming north bank of Wadyēn at Sheikh Moussa,
+ indicates position in which scraper No. 13 was found.
- Plate III. Fig. 1.—Northern affluent passing round north flank of “Pyramid Hill” to fuse with
southern affluent above 'Elwa el Dibban, the smaller mass on left bank in
middle distance of photograph.
Fig. 2.—View higher up the northern affluent.
- Plate IV. Fig. 1.—Interbedded conglomerates, marls, and limestones, north bank of northern
affluent.
Fig. 2.—The high terrace.

FIG. 1.

FIG. 2.

THE OLDER PALÆOLITHIC AGE IN EGYPT.

FIG. 1.

FIG. 2.

THE OLDER PALÆOLITHIC AGE IN EGYPT.

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FIG. 2.

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