

Notes and News

A PRIMITIVE THRESHING-MACHINE (PLATES I-III)

In the Editorial Notes I have emphasized the importance of studying primitive customs of the living to enliven one's prehistoric researches. An admirable instance occurred recently in Cyprus. As I was strolling through the village of Ayios Amvrosios on the north coast, I came quite unexpectedly upon a tribulum, leaning against a tree. Next day I photographed it (PLATE I), and obtained particulars of the method of manufacture.

The tribulum is a wooden sledge set with flint teeth, and it is driven over the corn to thresh it (PLATE II). It is made by the village carpenter, who also makes the wooden parts of ploughs. He showed me how it was done. A number of wedge-shaped holes are made in the bottom of the sledge—there are 345 in the specimen illustrated—and into these flint flakes are knocked with an iron hammer. They are hit on one of the long sides, mainly near the bulbar end, bruising and battering the edge considerably. This was done in my presence. I also examined the condition of the flakes in tribulums which have been in use for a long time and removed some of them, including those here illustrated. The battered (lower) edge had been worn smooth by use, sharp excrescences having even been worn down and polished to a high degree. This doubtless is caused by the silica in the straw, over which the sledge is driven. The pressure exerted upon the flints by the weight of tribulum and driver, aided by a ballast load of stones, must be considerable.

I submitted specimens of the flakes to Dr Grahame Clark, who has most kindly drawn them for me (FIG. 1) and who observed yet another feature, namely, the existence of longitudinal striae (visible under a lens) upon the polished surface. Dr Clark thus summarizes the characteristics of the flakes :—

'They are primary flakes, with a bulb and platform intact, and they have the following secondary features :—

- (1) one edge sharp, the other with more or less battering
- (2) the battered edge only shows diffuse lustre of the type associated with friction against corn-stalks
- (3) this same edge is rubbed smooth by use
- (4) on the surface of the smoothed areas striae can be seen under a glass, running parallel with the line of the flake '

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The archaeological importance of these facts will be obvious. If all these four secondary characteristics are present upon a flake, there can be no doubt about its use ; they prove that agriculture was practised by the people in whose culture-stratum they are found. It is remarkable that no close examination of tribulum-flakes seems to have been made before. For if they are found during the excavation of a site they contribute a most important piece of knowledge about its culture. It is suggested that in future excavators should examine closely such flakes as they may find (after washing them) with a view to determining whether they were so used. The number lost must have been enormous ; even in the specimen illustrated there are about 20 empty holes (I was only responsible myself for two) ; and no doubt the flakes need entirely replacing from time to time, after they are worn quite smooth. The flint is presumably obtained locally ; it occurs near the village.

If the tribulum was used on a site, flakes from it should be found literally in thousands. The Cypriote threshing-floors are situated immediately outside the village, and those I saw were on bare smooth earth. At the time I was leaving the island (at the end of May) the harvest had only just begun in the Mesaoria, where it is earlier than on the north coast. I secured a photograph of some children playing at threshing (PLATE II), which illustrates the process quite well enough. The driver is seated on a special wooden structure, but ordinary chairs are also used. I also saw and photographed a tribulum on sale outside one of the shops in Nicosia (PLATE III).

Enquiries from one or two ' flinting ' friends have failed to produce any evidence of tribulum-flakes from Britain. It is hoped that the publication of this note may result in the re-examination of collections and the close scrutiny of future finds during excavations. Weathering and patination might, of course, obliterate or obscure some of the four criteria ; but the presence of one battered edge would be suggestive, if it occurred constantly.

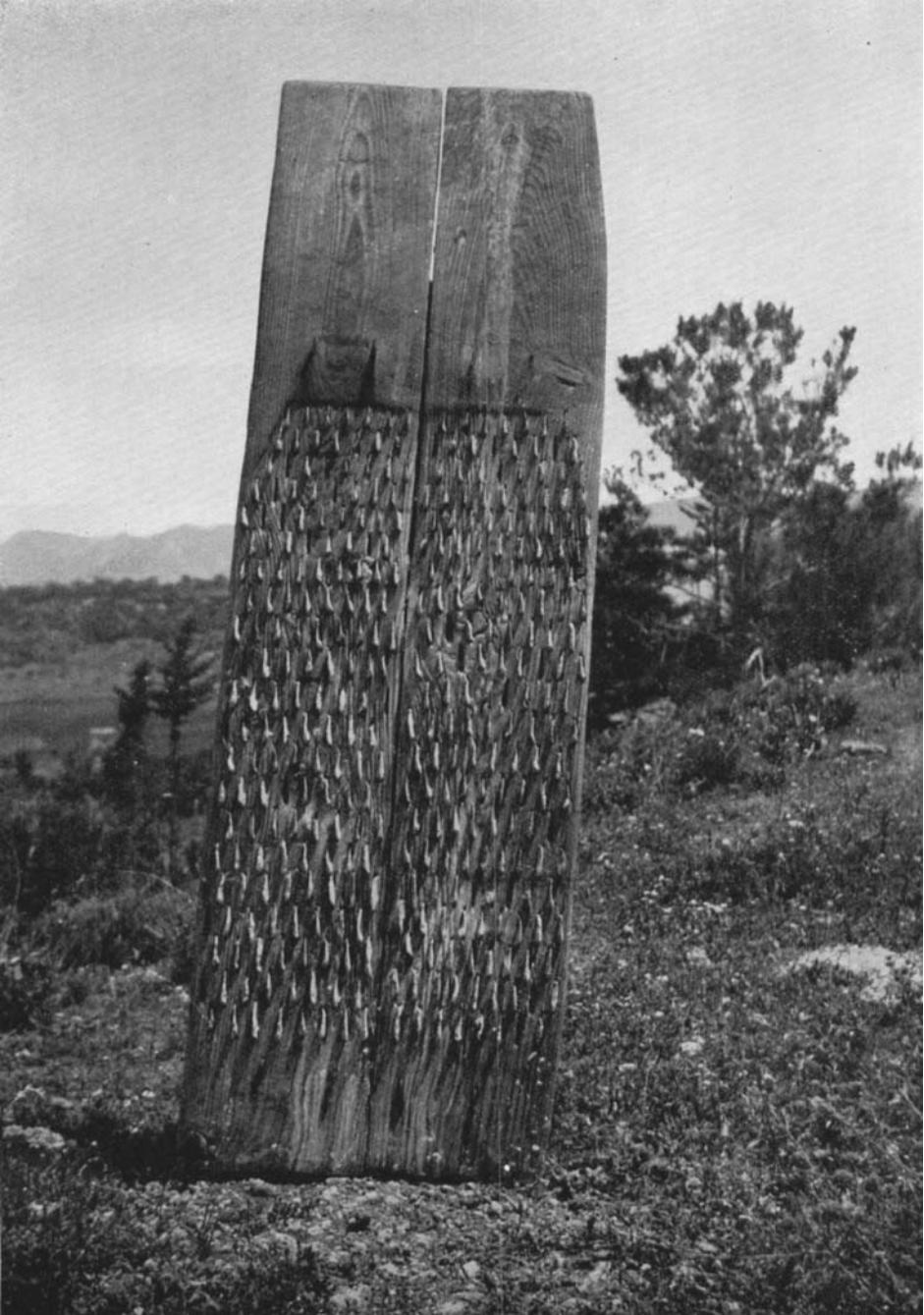
In his chapter on flint flakes and cores, Sir John Evans (*Ancient Stone Implements*, chapter XII, p. 256) has the following remarks :—

' There is, however, another cause why rude splinters of flint should accompany Roman remains, especially in the case of villas in country districts, for the *tribulum*, or threshing implement employed both by the Romans and other ancient civilized nations, was a ' sharp threshing instrument having teeth ',¹ in most cases of flint. Varro² thus describes the *tribulum* :—“ Id fit e tabula lapidibus aut ferro exasperata,

¹ Isaiah, chap. XLI, ver. 15.

² De Re Rust, lib. I, cap. 52.

PLATE I



TRIBULUM IN THE VILLAGE OF AYIOS AMVROSIOS, CYPRUS (See p. 335)
Ph. O. G. S. Crawford

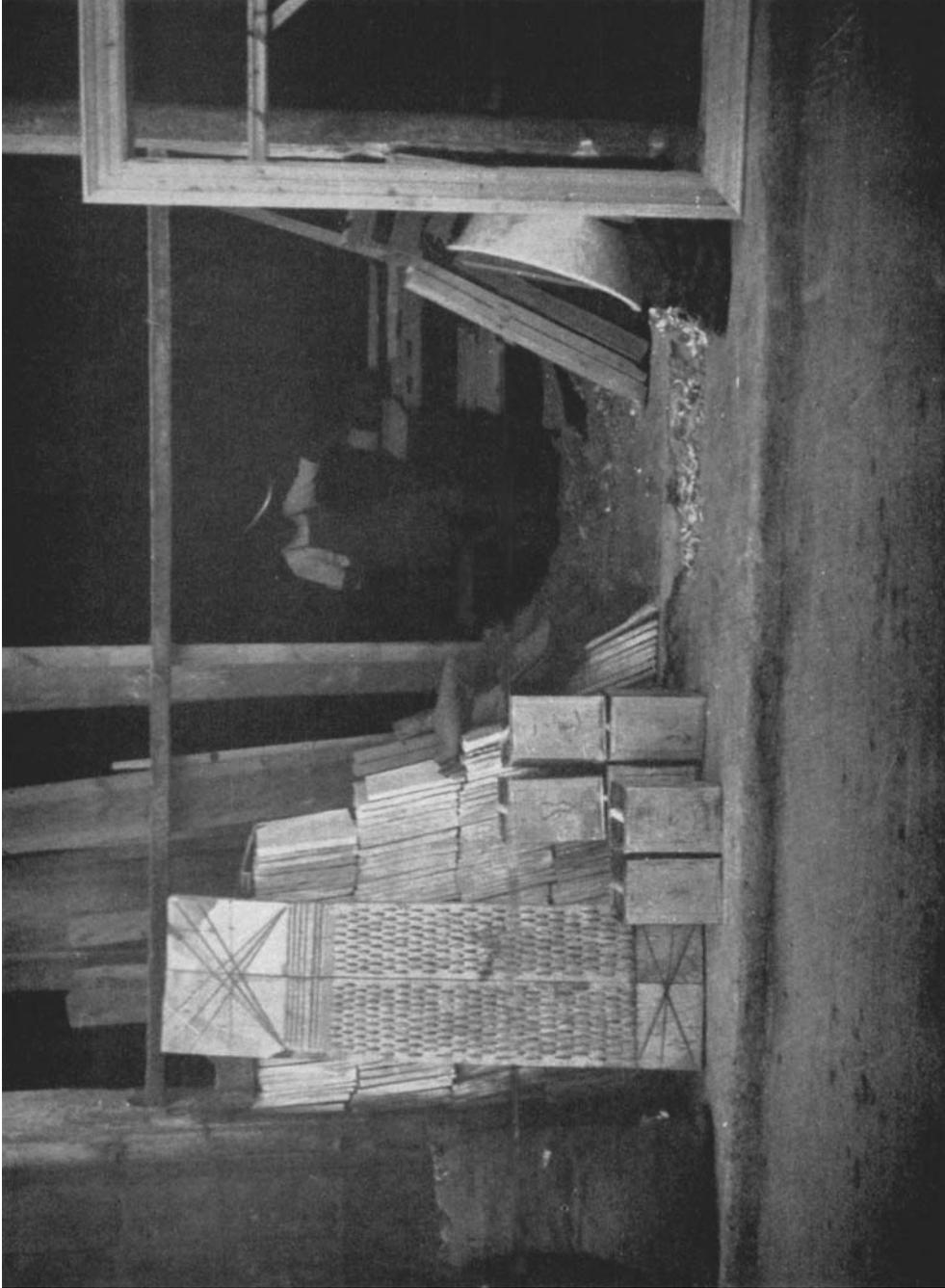
facing p. 336

PLATE II



TRIBULUM IN USE AT THE VILLAGE OF GEUNVELI, CYPRUS (See p. 335)
Ph. O. G. S. Crawford

PLATE III



TRIBULUM ON SALE OUTSIDE A SHOP IN NICOSIA, CYPRUS (See p. 336)

Pl. O. G. S. Crawford

PLATE IV

IRON PLOUGH-COULTER,
FROM THE WITCOMBE ROMAN VILLA,
GLOUCESTERSHIRE (*see p. 339*)
By permission of the British Museum



PLATE V



MEGALITHIC CARVINGS (MAIN GROUP), ST. PIAT, LE BERCEAU (See p. 342)

Ph. Stuart Piggott

PLATE VI



MEGALITHIC CARVING, ST. PIAT, LE BERCEAU (*See p. 342*)

Ph. Stuart Piggott

PLATE VII



HANDLED BEAKERS FROM BOTTISHAM (ABOVE) AND FORDHAM (BELOW) SHOWING DECORATION ON BASE (See p. 348). Scales in centimetres.
University Museum of Archaeology and Ethnology, Cambridge

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quae imposito auriga aut pondere grandi trahitur jumentis junctis ut discutiat e spica grana". Another form of the instrument was called *traha* or *trahea*. In the East, in Northern Africa, Madeira, Teneriffe, and probably other parts of the world, threshing implements, which no doubt closely resemble the original *tribula*, are still in use. The name is still preserved in the Spanish *trilla* and the Portuguese *trilho*, but survives, metaphorically alone, in our English *tribulation*. Drawings of various *tribula* have been given by different travellers,³ and the implements themselves from different countries may be seen in the Christy Collection and in the

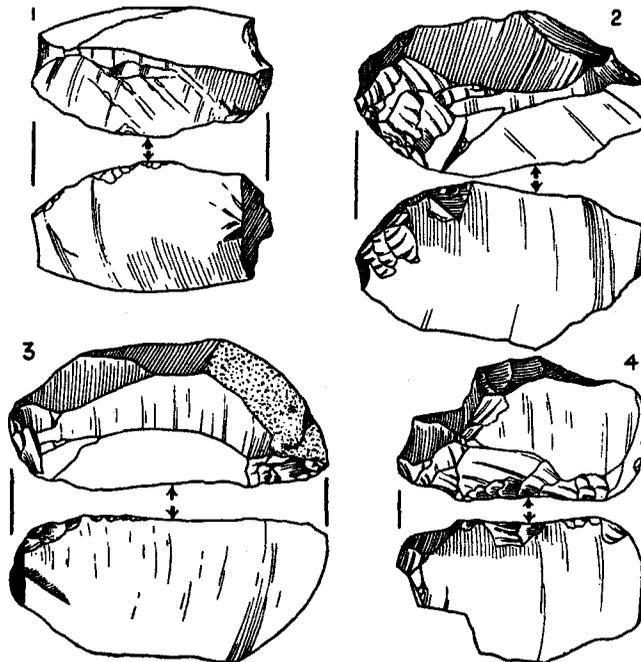


FIG. 1. CYPRIOTE TRIBULUM-FLAKES SHOWING BATTERED AND POLISHED EDGES, INDICATED BY ARROWS (See page 335)

Blackmore Museum [Salisbury]. They are flat sledges of wood, five to six feet in length, and two or three in breadth, the under side pitted with a number of square or lozenge-shaped holes, mortised a little distance into the wood, and having in each hole a flake or splinter of stone. In those from Madeira this is a volcanic rock, but in that from Aleppo—preserved in the Christy Collection, and shown in fig. 194—each flake is of cherty flint, and has been artificially shaped. Occasionally there are a few projecting ribs or runners of iron along part of the machine, but in most instances the whole of the armature is of stone'.

³ Smith's 'Dict. of Gk. and Rom. Ant'. *s.v.* Tribulum. Wilkinson's 'Anc. Egyptians', vol. II, p. 190: IV, 94.

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It only remains to add that, in addition to the British instances, there are nine tribulums amongst the agricultural exhibits in Monsieur Vayson de Pradenne's exhibition at the Trocadero (see page 257). Amongst them is one from Tunisia (1878) with iron guides and rough bits of flint only, not flakes, and another, from an unknown provenance, set with irregular squarish pointed lumps of some volcanic stone (? Madeira or Canaries). A minute specimen, about 14 inches by 6,



FIG. 2. THRESHING THE CORN IN ARMENIA
From Layard's 'Nineveh and Babylon', 1853

set with small obsidian teeth, must have served a somewhat different purpose.

The following additional description of the use of the threshing-sledge in Armenia is taken from *Nineveh and Babylon*, by A. H. Layard (London, 1853, pp. 17-18):—

The abundant harvest had been gathered in, and the corn was now to be threshed and stored for the winter. The process adopted is simple, and nearly such as it was in patriarchal times. The children either drive horses round and round over the heaps, or standing upon a sledge stuck full of sharp flints on the under part, are drawn by oxen over the scattered sheaves. In no instance are the animals muzzled—'thou shalt not muzzle the ox when he treadeth out the corn': but they

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linger to pick up a scanty mouthful as they are urged on by the boys and young girls, to whom the duties of the threshing-floor are chiefly assigned. The grain is winnowed by the men and women, who throw the corn and straw together into the air with a wooden shovel, leaving the wind to carry away the chaff whilst the seed falls to the ground. The wheat is then raked into heaps and left on the threshing-floor until the tithe-gatherer has taken his portion. The straw is stored for the winter, as provender for the cattle. These processes of threshing and winnowing appear to have been used from the earliest time in Asia. Isaiah alludes to it when addressing the Jews (xxviii, 27, 28; See translation by the Rev. John Jones):— 'The dill is not threshed with the threshing-sledge, nor is the wheel of the wain made to roll over the cummin . . . Bread corn is threshed: but not for ever will he continue thus to thresh it: though he driveth along the wheels of his wain, and his horses, he will not bruise it to dust. The oxen and the young asses that till the ground shall eat clean provender, which hath been winnowed with the shovel and with the fan (xxx, 24). Behold, I have made thee a new sharp threshing wain (sledge) armed with pointed teeth (xli, 15). Thou shalt winnow them, and the wind shall carry them away (xli, 16)'.

O.G.S.C.

THE ROMAN VILLA AND THE HEAVY PLOUGH (PLATE IV)

Air-photography and excavation have between them told us a good deal about Romano-British peasant villages and the way in which their inhabitants farmed their land. But though it is common knowledge that the characteristically Roman feature of the British countryside was the villa-system, no one seems to have produced much tangible evidence so far about the method or methods of villa farming. As there are signs that this gap in the achievements of modern archaeology may shortly be in some measure filled up by new work, the present moment seems a suitable one for the publication of a highly relevant older discovery.

The famous Roman Villa at Great Witcombe near Gloucester was discovered and excavated in 1818. The work was in the main supervised for the landowner, Sir William Hicks, bart., by Samuel Lysons, then fresh from his great discoveries at Bignor and at the height of his fame, and the two papers he read on the subject to the Society of Antiquaries appeared as a single short monograph in *Archaeologia*, 1819, xix, 178–183. The ambitious courtyard ground-plan, the fine suite of baths, the excellent mosaic pavements and the painted plaster of the walls all showed that here was a villa of (for this country) the first class. Lysons thought that 'such an edifice' must have been erected 'by one of the superior officers of the Roman government in Britain'; such guesses are no longer fashionable, but whoever the proprietor was, he must have been the owner of a big estate. Here if anywhere one would

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expect to find no mere peasant tillage, but real Romano-British 'high farming'. And among the 'great variety of utensils, etc.' recovered Lysons makes special mention of 'a ploughshare of iron weighing seven pounds and a half, which has been presented by Sir Wm. Hicks to the British Museum'.

Enquiries made in 1934 by Mr E. S. Applebaum have led to the identification of this 'ploughshare', which is now figured for the first time (PLATE IV). It was duly recorded in the Museum book of 'Donations' under 13 March 1819, but there was then no compulsory painting of all acquisitions with their registration-numbers: its identity was forgotten and it never received a label. Now there are no heavy examples of true ploughshares of Roman date in the British Museum, and indeed a 'ploughshare' weighing as much as $7\frac{1}{2}$ lb. would in any case be likely to be not a true share but a coulter. The Museum only possesses two coulters, and of these, one, unregistered and with apparently no history (though till recently stored in the Mediaeval Gallery), is disqualified by weighing 11 lb. 1 oz. The other, which weighs almost exactly 7 lb. 8 oz. and seems always to have been kept among the Lysons donations, is beyond doubt the Witcombe specimen, and it has now been numbered and labelled accordingly. It is $27\frac{3}{8}$ inches long.¹

We therefore now know that the Witcombe villa estate kept ploughs fitted with heavy wrought-iron coulters. Save for what appears to be a heavy kind of true share, with slanting 'ears' and a long shank, found in a hypocaust at the Box villa in Wiltshire, and now in the Devizes Museum (*Catalogue*, no. 494a (p. 59), pl. xxxiii, 1), this seems to be the first recorded piece of archaeological evidence for connexion between the Romano-British villa and the heavy plough. And whereas the Box implement is apparently not paralleled elsewhere,² the Witcombe coulter is an excellent example of the class well-known in Britain from the six found in the two hoards of blacksmith's scrap at Silchester,³ and the five from the great iron hoard found in 1854 at Great Chesterford.⁴ This class has recently been discussed by Lt.-Col.

¹ The coulter is mentioned by Lt.-Col. Karlake in the paper noticed below (*Antiq. Journ.* XIII, 455) as without known provenance: its identification followed a few months after that paper's appearance.

² It is clearly not a coulter, as the passage cited from the Devizes *Catalogue* might seem to suggest by mentioning the Great Chesterford coulters in connexion with it.

³ 1894, *Archaeologia* LII, 742; 1900, *ibid.* LVII, 247.

⁴ *Arch. Journal*, XIII, 1 ff.

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J. B. P. Karstlake, F.S.A.,⁵ who shows it to be a characteristic fitting of the wheeled plough or *caruca*, apparently as described by Pliny (*N.H.* XVIII, 43).

Discussion of the many issues raised in his paper would be out of place here, but in any enquiry into agriculture in Western Europe before, during, and after the period of the Roman Empire, an important part is bound to be played by correlation between any known type of agrarian unit, such as the villa in southern Britain, and any known type of agricultural implement, such as the heavy plough, and the type of tillage it implies. In this case considerations of weight and size show that the type of tillage implied should be some sort of strip-ploughing, for a heavy plough must cut a long furrow so as to turn as seldom as possible, and some kind of strip-field arrangement inevitably follows. The Witcombe coulter therefore gives an important hint of how the arable of at least one sort of Roman villa in Britain was laid out. Exactly what kind of strip-system this was, and what historical inferences may legitimately be allowed, are questions for the expert. It may be noted that readers of Paul Leser's *Entstehung und Verbreitung des Pfluges* will be able to supplement Col. Karstlake's list of similar continental coulters, and that the coulter from Bigbury Camp near Canterbury⁶ may reasonably be added to the evidence he marshals in favour of the introduction of the heavy plough to Britain by the Belgic invaders of the 1st century B.C.⁷ Provisionally at least that view seems now to hold the field. Then may our connexion between heavy plough and villa be taken as far back as the Belgic invasions? What stages lie between the little single-stading farm of the prehistoric Celt and the estate centred on 'such an edifice' as the Witcombe Villa?. Where archaeology is confronted with such problems, even small single pieces of material evidence, like that here brought forward, are likely to have their uses.

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⁵ *Antiq. Journ.*, Oct. 1933, XIII, 455-463.

⁶ Where much ironwork of late pre-Roman date has been found (*Arch. Journ.* LIX, 212 ff. : coulter, pl. II, 4a; *ibid.* LXXXIX, 87 ff.) and where Mr Jessup's recent excavations have established the fact of a Belgic occupation in the century or so before the Roman conquest, supervening on one of the earlier Iron Age.

⁷ A smaller implement, perhaps a native adaptation of the heavy 'Belgic' coulter, was found in the Glastonbury Lake-Village: Bulleid and Gray, *Glastonbury L.-V.*, II, 369, 384 (pl. LXI, I, 28), where others are mentioned from Ham Hill and the Lisnacrog-hera crannog.

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MEGALITHIC ENGRAVINGS (PLATES V-VI)

The megalithic monument containing the engravings illustrated is known as Le Berceau and is one of a group of such structures near the hamlet of Changé in the commune of Saint-Piat, 17 km. NW of Chartres (Eure-et-Loire). It consists of six supporters arranged roughly on three sides of a square, with the opening to the west, and covered by a capstone now broken in two. Until 1817 at least it was still more or less buried in what must have been the remains of a covering mound.* There is now no trace of this, nor is there any record of discoveries within the now gutted chamber.

PLATE V shows the main group of engravings, which are on the support forming the north side of the present entrance to the chamber. The technique is that of light 'pocking' of the stone, which appears to be a siliceous sandstone allied to our sarsen. The symbols represented include crosses, at least one hafted axe, zigzags, a curious 'plant' form, and 'bucklers'. Near the upper edge of the support adjacent to that bearing the main group of engravings is another 'buckler', the lower part flaked away (PLATE VI). As to scale, the large 'buckler' of the main group is exactly 4 inches high exclusive of 'horns', while the isolated 'buckler' in PLATE VI is 4.8 inches across between the 'handles'. Both photographs are necessarily oblique, in order to obtain the contrast of reflected light from the smooth surface of the stone.

The engravings obviously suggest comparison with those in the Breton megaliths, but it is difficult to find exact parallels. Hafted axes somewhat similar to that of Le Berceau occur at Mané er H'Roëk (*Corpus des signes gravés des monuments mégalithiques du Morbihan*, pl. 24) while the curious loop on the axe-haft is paralleled at Penhape (pl. 57) and the crosses at Mané Lud (pls. 44, 48). The 'bucklers' seem to represent the final degeneration of such forms as those of Ile Longue (pls. 65-66) with the crest of curved strokes reduced to two curved 'horns'. In Brittany something similar seems to have occurred at Pierre du Moustoir, where the crest is reduced to three or four strokes on either side (pl. 138), while the rectangular form of buckler (somewhat resembling that at Le Berceau) is found at Ile Longue itself (pl. 60).

A sketch of the engravings has been published by le Commandant Octobon in his *Statues-Menhirs, etc.*, pl. XLVIII, 1 and 5, and their existence recorded by M. Henri Bellanger in *Bulletin de la Société Préhistorique Française*, 1934, p. 327.

STUART PIGGOTT.

* Information from M. Bellanger.

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PLUVIAL AND GLACIAL CLIMATES

Perhaps it is not unjust to say that, at the moment, some archaeologists tend to write of the divisions of Quaternary time as if they were settled beyond debate, while most geologists decline to adopt this view. The following brief observations on the relation of past Pluvial to Glacial climates may therefore be of interest, since they are written in general terms from a geologist's point of view: they attempt to show why many members of that profession are unwilling, at the present juncture, to support with enthusiasm world-wide classifications and chronologies. In reducing a large amount of material to small compass I am indebted to Professor P. G. H. Boswell, Dr G. Simpson and Dr W. B. Wright for many helpful discussions and for valued criticisms and suggestions.

It has often been stated that an ice age must be world-wide in its effect. This is based largely on meteorological considerations which, whatever their functions in the cause of an ice age, must ultimately be a primary factor in the growth, maintenance and decay of land-ice. The existence of such ice certainly reduces to solid form a certain amount of the total moisture available in the atmosphere and hydrosphere. One of the objects of these notes is to discuss whether such abstraction and return of moisture will cause wetter or drier conditions near to and remote from the land-ice.

In the first place we are familiar with cold deserts in high latitudes, and with their existence in Quaternary times near the great masses of land-ice. The occurrence of pluvial conditions in these places does not then seem to be a glacial feature. There is, in fact, a notable deficiency of moisture above and near ice caps.

In the loess plains of northern France the occurrence of river and stream activity seems to have been intermittent and to have marked warm rather than cold phases of climate. We are familiar, also, in England with the rather loose description of gravel fans and terraces being formed 'during the melting of the ice sheets' in districts in which no land ice was present. The phrase expresses, nevertheless, the belief that more water was available, and greater river activity took place, with improvement of climate. This need not imply greater rainfall. Spring floods below the snow line in mountainous districts produce just such fans and terraces. We are wise if we proceed with great caution before we assume that such signs of active streams and rivers indicate pluvial conditions in regions adjacent to perennial snow and ice. They may, and probably do, indicate the melting of snow and ice, and

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of the superficial layers of ground ice. We need more striking evidence before we can assume a change of rainfall.

In short, non-pluvial conditions usually occur near land-ice, and apparent 'pluviation' in such districts may indicate nothing of the sort. This does not apply universally to ice- and snow-covered mountains in low latitudes.

Are pluvial conditions inter-glacial? First we must prove that the supposedly pluvial deposits are in fact inter-glacial. For this there is no surer evidence, with all its shortcomings, than the associated fauna and flora. Secondly, if we are assured that the deposits are inter-glacial, we have removed the attendant conditions of a glacial climate, which, though non-pluvial, produces deposits of pluvial aspect. Any proved inter-glacial formation of fluvial origin is, then, an indicator of the activity of the river, which is now gaining its supply ultimately from rainfall. If the deposits are torrential or markedly coarser than those that the river is now forming, we may fairly assume that they indicate a heavier rainfall, provided the gradient has remained virtually the same. In some rivers this similarity has been proved, their drainage lines are unchanged, and the fauna gives the requisite indication of temperature. The older deposits are almost invariably much coarser than those now forming and may fairly be considered to indicate pluvial conditions in inter-glacial times.¹

In brief, there is evidence in and near glaciated areas of non-pluvial cold periods and pluvial warm periods.

When we turn to regions remote from well known glacial centres our difficulties are increased. What criteria have we for coupling pluvial periods with glacial or interglacial periods? The method most used so far has been (1) to compare the number of pluvials with the number of Alpine glacial phases, and (2) to study the association of human implements. Even if we can convince ourselves that the numbers of pluvials and glacials agree, how do we know whether they are synchronous or interpolated?

I suggest that under the best of circumstances we can only know how many glacials or pluvials there were in certain regions, and that to accept one such chronology for the whole world in the present state of our knowledge is misleading. In the polar regions there is evidence, so far, only of a greater and earlier Quaternary glaciation and of a lesser which still exists, separated by a period during which the land-ice

¹ c.f. 'World Climate during the Quaternary Period', *Q.J. Meteor. Soc.*, 1934, LX, 426-478.

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retreated but did not disappear. We do not know whether the warm period of the north polar region was synchronous with retreat or glacial advance in the Antarctic.

In this country grave doubts exist in the minds of many of us as to the number of glacial episodes, the age of the first, and indeed what we should call the first. Recent work on the Somme must cause us to reorientate many of our old ideas.² Even the Alpine sequence does not remain unassailed, for Italian and other geologists are insistent that four glacial phases cannot be recognized in their mountains, though lowering of temperature rather than increase of precipitation seems to have caused glaciation.

An ice age, from a meteorological point of view, may be world-wide, but we have an abundance of evidence to show that the growth of land-ice, presumably as a result of that stimulus, and the migration and decay of its centres of dispersal was governed by regional conditions. Thus the three great ice sheets of North America were almost certainly no more than partly contemporary, and the glaciation of Greenland is older, and has certainly lasted longer than any of them.³ We are daily learning more of similar conditions in this country and in Europe. How do these span a fourfold glacial sequence, and in spanning it what were the effects of each and all of them on the rainfall of the tropics? Judging by the remaining volume of ice we are now only about half-way out of the last ice age, or half-way into the next: how then can we look on present conditions as normal?

It seems that we should keep two factors entirely distinct: (1) local glacial maxima and minima, each with a history of its own, and (2) meteorological episodes, by means of intricate and constantly changing climatic belts and storm-tracks, each influencing the other, forming and dispersing ice sheets, deserts, or rain-belts. Whether the sequence established in a part of the Alps is a pure record of the meteorological episodes remains to be proved.

Turning to the use of human implements as time-pieces, we meet some doubtful factors: we know little of the time value of perspective when we look towards the older industries, though there is reason to suppose that they lasted longer than the younger. We do not know what allowance of time to attribute to dispersal of forms, and that

² H. Breuil and L. Koslowski. *L'Anthropologie*, 1931, XLI, 449-88; 1932, XLII, 27-47, 291-314.

³ L. R. Wager, *Geol. Mag.*, April 1932, has indicated that Greenland was already glaciated in Tertiary times.

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dispersal was far from general or uniform. We are faced at the start with the doubtful relation in this country of the Chellean or early Lower Palaeolithic to a glacial phase, we are not sure which phase with relation to the Alpine sequence. Although implements are by far the best zonal indices, we have much to learn and undue confidence obscures the real issues.

Is a pluvial climate as significant a thing as some of us imagine it to be? Heavy rainfall is a far less unusual event than the growth of an ice-cap on high or low ground. If it is true to say that, at least in mountains, there has always been ice, surely it is a great deal more evident that there have always been districts of heavy rainfall. There are tropical rains now, but we do not attach glacial or interglacial significance to them, nor to the annual migrations of the rain-belts. When we find that there has been more rainfall in country now desert or rather dry, though well within the tropics, we are perhaps unduly overcome with a desire to correlate. Above all I would suggest that variation of rainfall may be regional without a world wide cause, especially in warm-temperate and tropical lands, and that a little more rain than usual may have disproportionately great effect on the ground. Similarly a slight change of climate, and the eviction of goats, camels, and certain agricultural methods would render large parts of the Sahara and its borders habitable again, as they were not so long ago. Moreover growth or failure of vegetation, presence or disappearance of standing water, may have reciprocal, if minor, effects on the atmosphere.⁴ Such factors lessen the significance of pluvials in correlation, though their importance to the human species is, and always has been, enormous.

If we are to associate regional pluvial conditions with regional glacial oscillations, and both with an ultimate meteorological episode, we must have an accurate method of synchronization. It may be claimed for De Geer's glacial varve-clays that they keep one condition a constant, *i.e.* the presence of ice, either by latitude or altitude, and give us the all important factor of solar radiation, the meteorological glacial or interglacial, shorn of all complications of its effect on the ground. De Geer has himself pointed out many of the pitfalls into which the careless or ignorant may slip in attempting such work, but, even if all these are avoided, the personal factor in many forms plays a dominant part that is not wholly acceptable.

If we accept the results we should find ourselves in possession of a synchronized chart of the 'health' of glaciers from high latitudes to

⁴ R. E. Moreau, *Journal of Ecology*, 1933, XXI, no. 2.

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low over a long term of years. Now attention has been directed in East Africa to supposedly synchronous oscillations of wet and dry sub-epochs in the plains, advance and retreat of the glaciers in the adjacent mountains.⁵ Any measurements of silt accumulations due to rains in these parts must take account of more than one period of rain per year, as at the present day, but the glacial varve is recording at the same time ice melting as a result of solar radiation in particular, an annual oscillation with possible variation of a term of years. Nilsson has correctly pointed out, therefore, that the correlation of glacial and pluvial banded clays, even in the same ideal district, is not so simple as it appears at first sight.

The main result of Nilsson's valuable work there is to suggest that local glacial advances were accompanied by wet sub-epochs in the plains, retreat with dry periods; in fact the more precipitation the more snow on the mountains and rain on the plains. But in Western Europe the arid loess plains are associated with cold periods and growth of ice, running streams with warm fauna and glacial retreat. So one gathers that in cold-temperate lands and high latitudes the pluvial was interglacial; that in tropical lands pluvial and glacial increase go together. Varves should synchronize the glacials of high and low latitudes: in fact they seem to record the retreat of glaciers in high latitudes (interglacials) and, as Nilsson has shown, the glacial (or pluvial) of low latitudes.

It will be realized, therefore, that long distance correlation is no easy matter and that glaciation may be dissimilar in cause and effect in high and low latitudes. How far are warm-temperate regions an almost inextricable mixture of these two, and is not the type-area of the 'standard' Alpine chronology within or near that belt? For these and similar reasons one feels that Quaternary climate was flexible regionally, in altitude and in latitude, in temperature and precipitation. Behind the local manifestations of climatic change lie, presumably, certain essentially meteorological factors such as Dr Simpson's theory demands, but it is probably incorrect to suppose that they would give identical and synchronous climatic changes over the surface of the world. Centres of glaciation had their own maxima even in this country: so also did regions of rain and desert wax, wane, and migrate regionally. It remains to be shown what essential connexion there is between rainfall and glaciation, local or world-wide.

K. S. SANDFORD.

⁵ E. Nilsson, *Geografiska Annaler*, 1931, XIII, 249-348.

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HANDLED BEAKERS (PLATE VII)

Handled beakers as a class have been discussed by Sir Cyril Fox (*Arch. Camb.* LXXX, 1). The purpose of the present note is to call attention to certain features of form and decoration as exemplified by two vessels in the Museum of Archaeology and Ethnology at Cambridge. It seems that a dual division within the class should be made between handled beakers such as those illustrated, whose simple, mug-like forms have no connexion with the A C types with which they are culturally allied, and beakers of vaguely A C forms with handles attached.

The distinguishing features of the beakers illustrated are the cylindrical form, the massive strap-handles and the curiously decorated base, ornamented with circles and radial lines. The Bottisham beaker in particular suggests a non-ceramic form, and it seems probable that such vessels are copies in clay of wooden mugs turned from a log on a lathe. The beakers have a decidedly 'wooden' appearance, and the type of handle is precisely that which could most easily be carved from the solid projection left for this purpose in the turning. Moreover, such an origin for the type would explain the decoration of the base, the concentric circles being a reminiscence of the growth-rings visible in the transverse section of a log; the radial lines, the medullary rays and the cracks which usually form along them.

The existence of some form of lathe (probably a pole-lathe) in the Early Bronze Age has to be assumed to account for the turned shale and amber cups (cf. R. S. Newall in *Wilts. Arch. Mag.* XLIV, III-117). As Mr Newall pointed out, the use of amber suggests a Scandinavian origin and he instances wooden cups from Schleswig and elsewhere. The Nordic connexions of the A C Beaker culture, first pointed out by Childe (*Danube in Prehistory*, 200-201) has been emphasized by Clark (*ANTIQUITY*, 1931, v, 426) and if the origin suggested above for our handled beakers be correct, we have an important link between the turned cups and the A C complex.

STUART PIGGOTT.

THE IRON SPEAR OF BUHEN

In reading the review of the second edition of Mr A. Lucas' very valuable *Ancient Egyptian Materials and Industries*, in *ANTIQUITY* for June, I note a passage (p. 238) on iron in Egypt which your reviewer quotes in inverted commas. Mr Lucas states of the iron spearhead which I found at Buhen, opposite Wady Halfa, in 1910, that 'more evidence must be adduced before the date assigned to this object can

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be accepted, especially as it is practically identical with spearheads used until not many years ago in the same locality'.

Now if this last sentence has any meaning it must mean that Mr Lucas suspects that the tomb in question was opened by some Sudanese warrior in comparatively recent years, perhaps during the Dervish War, and that the said warrior was careless enough to leave his own spear in the tomb. Let me assure Mr Lucas and your readers that his hypothesis cannot be seriously considered for a moment. The tomb, which I excavated with the greatest care, had not been opened for many centuries, if ever, after it was built. The evidence, which is given in detail in the publication of *Buhen*,* while not positively excluding the 18th Dynasty is far more in favour of the 12th. It should be remembered that the 2nd Cataract is on the edge of the Sudan, which authorities as great as the late Prof. Gowland have held to be one of the earliest centres of ironworking. It seems not at all impossible that this weapon might have been obtained in commerce or war by a frontier garrison living several hundred miles south of the unwarlike capital of Egypt.

DAVID RANDALL MACIVER.

Mr A. LUCAS writes :—

As, at the time of writing, I am away from note books and works of reference, I am unable adequately to deal with Dr Randall MacIver's suggestion that the primitive iron-smelting in the Sudan may be of very early date [12th Dynasty, about 2000 B.C., or 18th Dynasty, about 1580 B.C. to 1350 B.C.]. This suggestion is supported by a reference to the late Professor W. Gowland, F.R.S., an eminent metallurgist and a writer on ancient metallurgical methods. In my opinion there is neither evidence nor probability for any such early date and it is now generally accepted that the production of iron from its ores originated in Western Asia and that the Sudanese iron-smelting is comparatively late. Since Professor Gowland wrote, much fresh information concerning early metallurgy has been obtained.

[The controversy centres round a definite object—the iron spear of Buhen—either this was found with 12th or 18th dynasty associations, or it was not. Surely it should be possible to prove or disprove this simple point? The exact typological analogies of the spearhead, its mineral condition, etc., are important, but secondary. We are

* University of Pennsylvania: Egyptian Department of the University Museum. Eckley B. Coxe, junior, Expedition to Nubia, vol. VII. BUHEN, by D. Randall MacIver and C. L. Woolley. 1911.

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prepared to give space to a further discussion of this matter. What really is required is a full illustrated description of all the early finds of iron objects in Egypt and Mesopotamia ; but for the moment we had better confine ourselves to Buhen. EDITOR.]

EGYPTIAN FRAGMENTS (PLATES VIII-IX)

The accompanying photographs, for which thanks are due to Mr E. H. SAWYER of Cairo, show two unpublished sculptured slabs of limestone which were built in the 11th century A.D. into the wall of a staircase inside the Bab el Futtûh, one of the most important gates on the north of Cairo. The dimensions of both blocks are approximately 24 inches by 18 inches ; they are apparently fragments of wall-reliefs from ancient Egyptian tomb chapels, and may be assigned by their style to the Old Kingdom.

The relief (PLATE VIII) of the hippopotamus is a fine piece of work, perhaps the best portrait of this animal that has come down to us from the Old Kingdom. It is in very low relief, and for that reason photographs badly ; it should be dated probably to the 5th or 6th Dynasty. Above is the hieroglyph ^{heb.} 'festival', and a number of unintelligible scratches. Similar representations of a walking hippopotamus are not uncommon in the Old Kingdom,¹ but almost invariably they have a background of water (indicated by parallel wavy lines) and river plants, or are surrounded by fishes, in a scene of fishing or hunting in the marshes. The sudden cessation of the block-pattern border may indicate that the relief is unfinished, but the presence of a hieroglyph immediately above the figure seems to preclude the possibility that it was to form part of the familiar river-hunt scene which was a favourite theme of the Old Kingdom artists. In view of these peculiarities, it may be that the slab was a sculptor's trial-piece, and was never intended to form part of a tomb-relief. The sculpture has lost its original colouring, but being built into the wall at floor level, has escaped injury at the hands of visitors.

The other relief (PLATE IX) is less well cut, and contains portions of two scenes, divided by a thick line. The upper scene shows short-horned cattle, which have been artificially fattened for the slaughter-house, walking in single file as offerings for the owner of the tomb. They are presumably being driven by a herdsman at the back. There

¹ Von Bissing, *Die Nastaba des Gem-ni-kai*, bd. 1, pl. iv. N. de G. Davies, *Rock Tombs of Deir al Gebrâwi*, part II, pl. iv.

PLATE VIII



SCULPTURED SLAB OF A HIPPOPOTAMUS, BAB EL FUTTÚH GATE, CAIRO (See p. 350)
Pl. E. H. Sawyer

facing p. 350

PLATE IX



SCULPTURED SLAB OF CATTLE AND OF MEN CARRYING OFFERINGS, BAB EL FUTUH GATE, CAIRO (See P. 350)
Pl. E. H. Sawyer

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are two registers, divided by a thin groundline ; the animals on the top line have only their legs remaining. The hieroglyphic group between the first and second animals of this row is illegible in the photograph. The lower scene depicts three men bringing offerings in shallow bowls or baskets ; the contents of the bowls are stated above them to be *km'i*, and seem to be round berries or fruits of some kind. The word is not found elsewhere. Below the arms of the third bearer of offerings there was a further inscription, of which only *n* and the tops of two other signs are visible. The hindmost figure differs from the rest ; he wears a diagonal linen band passing over the left shoulder and beneath the right arm. In the Old and Middle Kingdoms this is sometimes a mark of noble birth, and is also worn, both then and later, by the *kher-heb* or lector priest as a badge of distinction. The present figure is probably a lector priest ; he carries in his left hand a similar linen strip. Two of these cloths are often carried in the reliefs by men in the offering procession,² generally behind the bearer of incense ; the man who brings them usually holds them outstretched before him, one in each hand. The offerer may here have another in his right hand, which is lost. The word above the offering looks like *..it* but is very indistinct. The red colour of parts of the relief is still preserved, though the surface has been much disfigured by scratches and Arabic graffiti ; the stone was built into the wall up-side-down, about three feet from the floor.

Cairo contains a large number of such fragments, often in the most unexpected places, and the majority of them still unpublished. Saqqara is the most obvious source, being near at hand and abounding in good limestone which the later builders could usurp. It is unlikely that the exact provenance of any of these reliefs will be traced ; the tombs from which they came must long ago have been plundered and destroyed.

M. S. DROWER.

[The Editors wish to thank Mr E. H. Sawyer for the great trouble he has taken to secure photographs of these interesting and hitherto unrecorded sculptures. It is to be hoped that amongst the thousands who take their cameras to Egypt each year some may be found who will photograph the other fragments. There could be no more interesting task, but in this as in all else, good results cannot be obtained without skill and taking trouble].

² M. A. Murray. *Saqqara Mastabas*, vol. I., pl. VII.