THE MICROLITHIC INDUSTRY OF LANGHNAJ, GUJARAT*

by

PROFESSOR F. E. ZEUNER, D.SC., PH.D., F.G.S., F.Z.S.

Department of Environmental Archæology, University of London Institute of Archæology

182 In 1946 H. D. Sankalia described a prehistoric site at Langhnaj in Gujarat.[1] It yielded a large number of microlithic artifacts which, in the higher levels, were associated with the remains of pottery. I have since investigated the environmental conditions and the position of the site within the framework of climatic fluctuations.[2] The site has further yielded human remains[3] and a large amount of mammalian bones which were originally regarded as representing a domesticated fauna.[4] These faunal remains, at present under investigation, are in a bad state of preservation. They are broken not only by man but by lime concretions which formed in the cracks and disintegrated many of the bones which at the time of deposition were still relatively intact. Moreover, all the bones are covered with a calcium carbonate crust of the '*kunkar*' type, so that few details are available for investigation unless the bones are treated. The bone matter being softer than the *kunkar*, they could not be prepared mechanically. They were immersed in dilute acetic acid, which dissolves carbonates more rapidly than phosphates, and a careful check was kept on the progress of the reaction, especially in order to prevent the bone falling to pieces where it was held together by the calcium carbonate cementing the cracks.

This long-drawn-out preparation has, however, brought forth some interesting results. Though the identification of the species present still requires some time, it has become certain that game animals are conspicuous in the fauna. Of these, the Indian rhinoceros (*Rhinoceros unicornis* L.) is the most remarkable, the Hog Deer (*Hyelaphus porcinus* (Zimm.)) is frequent, and the bovine remains appear in part to be Indian buffalo, quite possibly a wild form. Some small horn cores, which superficially resemble those of the Neolithic *longifrons* cattle of Europe and were presumably interpreted as taurine remains in the previous identification, may belong to the Nilgai Antelope (*Boselaphus tragocamelus* Pall.). Among the smaller ruminants, the Black Buck (*Antilope cervicapra* (Linn.)) appears to be present, but this requires final confirmation. Of the species which cannot be regarded as game, the mongoose (*Herpestes* sp.) is represented by an almost complete skeleton, evidently of an animal which perished in a burrow and therefore need not be contemporary with the human occupation. Remains of a dog-like animal have been found also. It is possible that the presence of domesticated animals can be established after all, but game animals are so conspicuous in the food debris of this site, that its microlithic occupants' economy must have been largely dependent on them.

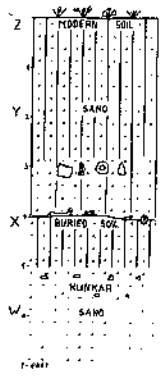


FIG. 1. SECTION OF THE MICROLITHIC SITE OF ANDHARIO TIMBO, LANGHNAJ
After Zeuner, 1950

The aspect of the microlithic industry agrees with the faunal evidence. Microliths occur throughout the Langhnaj section (fig. 1). They are concentrated in the neighbourhood of the ancient land surface (X), but the rhinoceros shoulderblade which is discussed below came from between five and six feet deep in the sand (W). It certainly belongs to the pre-pottery phase. The sediment is a fine-grained dune sand which forms an eminence in the surrounding country. The details of the environment have been published elsewhere.[5] Here it is important to note that the makers of the microliths sat on a sandhill, much as was the case in so many microlithic sites all over the world. The industry (fig. 2), which does not vary throughout the deposit, is of a poor quality. Rather fewer than one in 100 artifacts can be regarded as tools. There are innumerable irregular flakes which were apparently never used. This is not surprising in view of the raw material encountered at the site. In all probability pebbles were collected on the Sabarmati river some miles away and taken to Langhnaj. The only raw materials available were grey, pink and brown cherts and jaspers, and vein quartz. The cherts and jaspers break irregularly and the cores illustrate that it was very much a matter of luck to obtain a usable flake (fig. 2, Nos. 2, 3, 4). Accidental step flaking was almost the rule in

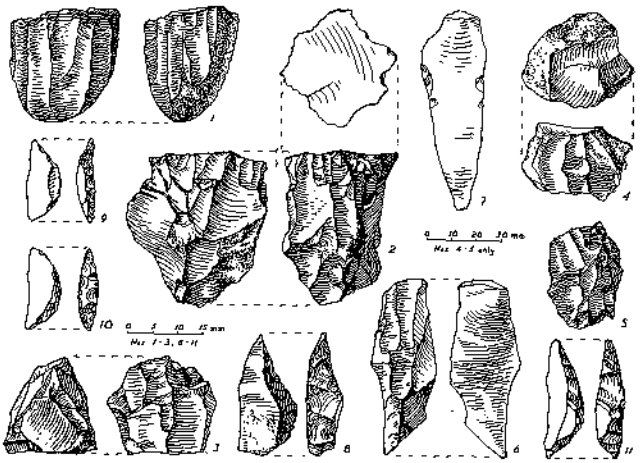
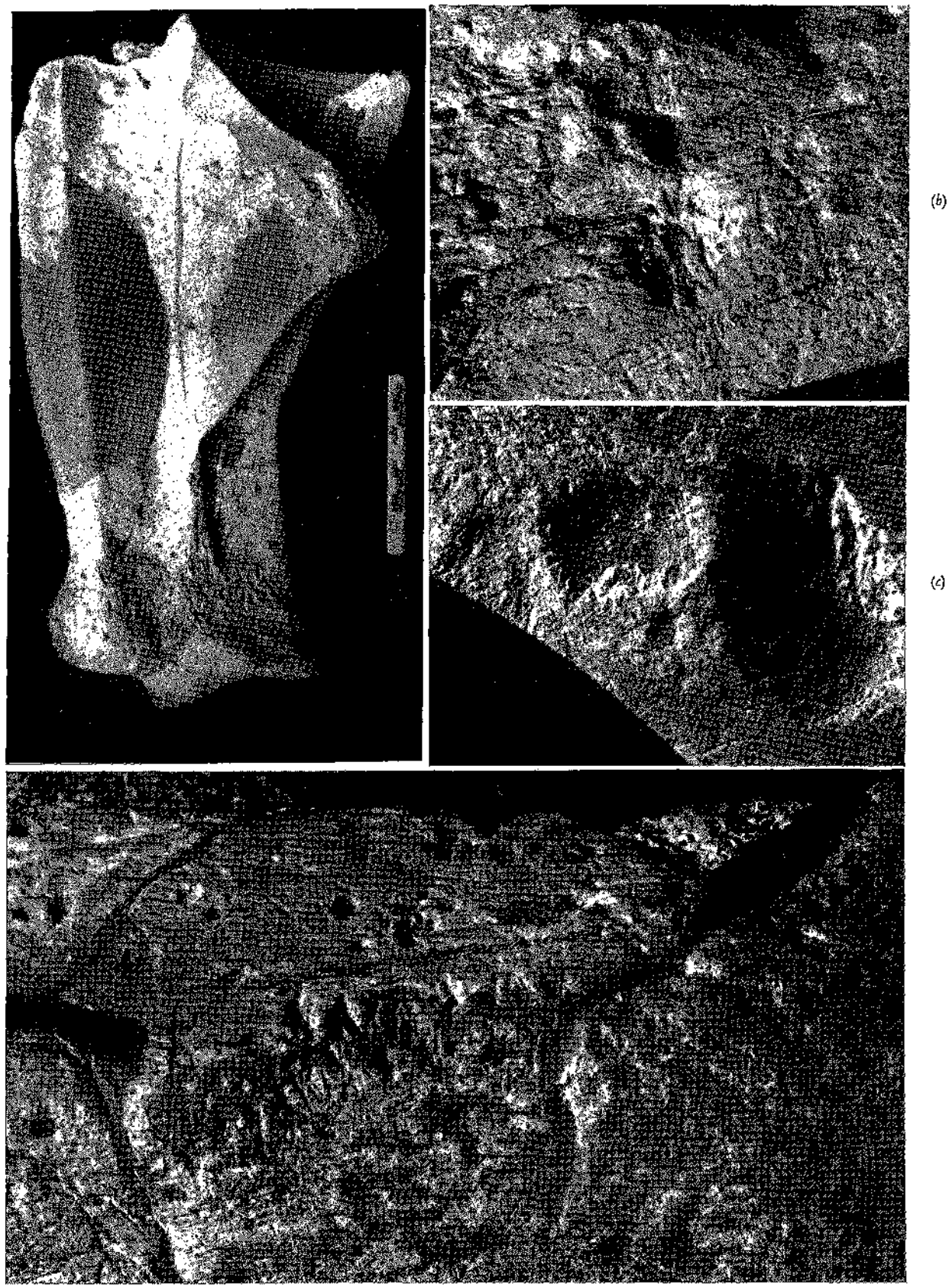


FIG. 2. MICROLITHIC INDUSTRY OF LANGHNAJ

1, Fluted core made from one half of a quartz pebble; 2, ordinary fluted core made from jasper; 3, polyhedric core (earlier flake scars used as striking platforms); 4, rough polyhedric core; 5, flake struck by Clactonian technique and later used as core (similar specimens were frequently used as scrapers); 6, 7, unused blades from fluted cores; 8, asymmetrical backed point (a type tool of the Indian microlithic hunting industries); 9, lunate, back blunted from underside only; 10, lunate, back blunted from both sides; 11, asymmetrical lunate, transition to asymmetrical point. No. 1: coll. Deccan College, Poona, India; nos. 2–11: coll. University of London Institute of Archæology.

* *With Plate I and two text figures*



(a) (b) (c) (d)

RHINOCEROS SHOULDERBLADE ANVIL, LANGHNAJ, GUJARAT

Coll. Deccan College, Poona. (a) *View of the shoulderblade with the spine replaced.* ×0·29. (b) *Anvil pit No.* 1. ×1·7. (c) *Anvil pits Nos.* 4 *and* 3. ×1·85. (d) *Area of crest where, presumably, the backing of the microliths was carried out.* ×1·85.

these materials as illustrated by the cores. This explains the enormous amount of waste on the site. From the point of view of flaking qualities, the vein quartz appears to have been somewhat better. If good quartz pieces were found they were treated with great care. A quartz pebble with a diameter of 21 mm., for instance, had been split across and then used as a core to obtain minute blades by the fluting technique (fig. 2, No. 1). The striking platform was re-chipped from time to time. At least eight flakes were taken from this minute specimen, each about four to five mm. wide and not more than 20 mm. long. This is a masterpiece of microlithic flaking.

Other fluted cores were made of chert. Their condition shows plainly that this was an unsatisfactory way of using a bad raw material, for many of the intended blades broke off half-way down the core. Nevertheless, they illustrate that the makers were trying to use fluted cores wherever possible. Even rejuvenation of such cores was practised, since Sankalia found trimming flakes which had been taken off the end of the core.

Other cores are of the irregular polyhedric type, in which the previous flake scars were used as striking platforms for the next series of flakes until the core was worked down to a minute size, or until a flaw in the material made further flaking useless (fig. 2, Nos. 3 and 4). Some 'cores' were made from thick flakes (fig. 2, No. 4), here as in other Indian localities, such as the Jubbalpore sites discovered by D. H. Gordon. Both cores and trimming flakes were occasionally converted into scrapers by retouching a suitable edge.[6] Among the implements made from blades and flakes, parallel-sided specimens are not infrequently found, but it is usually impossible to say for certain that the edges were used. Backed blades are either rare or absent altogether. The commonest type of implement is the lunate backed along the arc, sometimes from one side only (fig. 2, No. 9), sometimes from both sides, mainly when the back of the specimen was thick (fig. 2, No. 10). The lunates are 15 to 20 mm. long. They grade into asymmetrical specimens in which the arc forms a bulge nearer one end of the specimen (fig. 2, No. 11). These specimens could equally well be described as a kind of point.

Apart from the lunate group which is characteristic but fairly ubiquitous in microlithic industries, there is another, the asymmetrical point (fig. 2, No. 8). It is made from a thick flake with a high rib by the method of backing one of the sides obliquely away until a sharp point is obtained. In view of the thickness of the flake, the backing is carried out from both sides. The specimen figured is 24 mm. long. It is difficult to interpret this type of point, which is characteristic of Langhnaj and a few other microlithic sites in India, as anything but an arrowhead. It is one of the few items that distinguish the Indian microlithic 'hunting' industries from the Wilton of South Africa. They have, however, this point in common with Australian microlithic industries.

That these microliths are to be regarded mainly as barbs and points or arrowheads has been evident since Vignard published his interesting article on Egyptian arrowheads.[7] It is inferred, therefore, that the Langhnaj industry was made by a people who subsisted mainly on hunting, and this is confirmed by the faunal evidence.

When found, the shoulderblade, which is the main subject of this article, was lying with its spine downwards in the sand. It is a left one, about 43 cm. long. Its characters agree with the species *Rhinoceros unicornis*, though the teeth found at Langhnaj suggest the possibility that a sub-species occurred in Gujarat which is not identical with the surviving Nepal and Bengal races. The spine of the shoulderblade of this species is produced into a remarkable overhang which forms the roof of the infraspinous fossa (Plate I*a*), much as in the European pig. This overhanging portion of the spine was detached from the blade when it was found, along a fracture parallel to the axis of the shoulderblade. It was incompletely preserved in several fragments. These were pieced together and mounted in their correct position on the shoulderblade. When the preparation was complete, it was discovered that there were at least eight artificial pits measuring 10 to 25 mm. across, on the upper side of the blade. Since there are numerous other pits on the specimen due to partial solution of the bone (Plate I*d*), and also a few scratches resulting from damage in the course of excavation, the true nature of these pits was not noticed until the incrustation had been removed almost completely (Plate I*b*, *c*). It then became evident that these pits were present on the bone before the incrustation began, and in order to preserve the evidence one of them (No. 8) was left with part of the incrustation remaining. Surprisingly enough three of these pits (Nos. 3, 4 and 5) were in a position so close to the overhang of the spine that they could not have been made unless the spine had been removed previously. The fracture of the spine, therefore, is artificial, in other words the spine had been removed by man before these pits were made.

The pits in question are either circular (Nos. 1, 2 and 5) or oval (Nos. 3, 4, 7 and 8), whilst one (No. 6) is only partially preserved. What is available of it suggests that it was very shallow and made up of three separate centres. The pits are all crowded with short cut marks which are mostly arranged radially (Plate I*b*). A few run across the pits without passing through the centre, so that it looks as if the pits are the result of the frequently repeated action of sharp cutting edges, which were impressed upon the bone in all manner of directions, though more or less exactly on the same spots. The result of this repeated operation was a wearing-away of the bone, which naturally was deepest where the largest number of cuts were superimposed. It is clear that these cuts, the longest of which is of the order of 12 mm., cannot have served any purpose such as cutting or carving the bone. The explanation which suggests itself is that the bone was used as an anvil for the manufacture of microliths, the cores being placed on the bone and the cuts being produced either by the sharp edge of the core or by the edge of the flake when it was being struck off. The fact that the overhang of the spine had been removed deliberately and that parts of the surface had been used, which would rest flat on the ground, suggests that a bone anvil was considered an advantage in making small microliths. The thickness of the bone would prevent it from

splintering and its weight made it stable. It might be worth while to experiment with bone anvils in order to find out whether they are more suitable than stone anvils for the manufacture of microlithic blades and flakes.

The bone was lying upside-down when found, so that it must have been turned over after the pits had been made. On the underside thus exposed there is one further place where ancient cut marks occur. It is on the underside of the infraspinous fossa near the upper end, on the crista or edge which is formed by the main underside surface of the blade and its upturned margin. The cuts on the edge are all parallel and extend over about three centimetres of the crista, being at right angles to it. They may have been made in one of two ways; either by a knife-like instrument drawn across this crista or by means of chisel blows, like the cuts in the pits on the upper side, except that the core, or whatever else acted as a chisel, was held always in the same position at right angles relative to the crista. The odd thing is that the cuts do not extend far on the underside of the shoulderblade but are virtually restricted to its upturned flange. If they are the result of a cutting operation, it would have been necessary to hold the shoulderblade upright, resting on its left edge. On the other hand, the same position would have been required for the making of the cuts by percussion. It is, however, so unstable a position that the shoulderblade would have had to be held securely between the feet or knees, or by the hands of another person, and this is probably the reason for the removal of the spine. Experiments have shown me that a shoulderblade of this shape cannot be held securely between the knees unless the spine is taken off. It is difficult to interpret the incisions except as the result of a deliberate cutting operation, since they are too long, deep and regular to be percussion marks of the kind found in the pits, and their location would be inexplicable. Experiments were therefore made on the shoulderblade of a horse and using blades of different sizes made from fluted cores. It became at once evident that the position is indeed awkward for percussion. It is, however, convenient for retouching by pressure since the shoulderblade, held between the knees, allows the hands to be used freely on the two sides of the narrow 'anvil' platform afforded by its edge. But the marks left on the bone by pressure retouching are vague, since the artifact is liable to slip. A cross-cut was then made at right angles to the edge of the bone, much like the cuts present on the Langhnaj specimen. It was then found that, if the blade was placed close to the cut, being tightly held with the fingers on both sides, and then pressed so as to slip into the cut, retouching became an easy matter. Chips up to four mm. long could be readily detached. It was easy to produce the steep retouch so characteristic of backed blades and small scrapers, to carve notches into blades to make micro-burins by twisting off the end portion, and to produce the rounded back of a lunate. For this reason, the rhinoceros shoulderblade from Langhnaj may tentatively be regarded as the anvil of a microlith-maker, the pits being the places where the blades were struck, and the cuts on the edge the places where the 'backing' operation was carried out.

Notes

[1] H. D. Sankalia, *Investigations into Prehistoric Archæology of Gujarat*, Baroda (State Press), 1946.

[2] F. E. Zeuner, 'Stone Age and Pleistocene Chronology in Gujarat,' *Deccan Coll. Mon. Ser.* 6, 1950.

[3] I. Karve, in Sankalia and Karve, 'Early Primitive Microlithic Culture and People of Gujarat,' *Amer. Anthrop.*, Vol. LI (1949), p. 32.

[4] A. H. Khan and I. Karve, in Sankalia, *op. cit.* (note 1), p. 313.

[5] F. E. Zeuner, *op. cit.*, p. 4.

[6] Sankalia and Karve, *loc. cit.*

[7] E. Vignard, 'Armatures de flèches en silex,' *Anthrop.*, Vol. XLV (1935).

PREHISTORIC BEADS FROM TIBET*

by

DR. R. NEBESKY-WOJKOWITZ

Kalimpong, Bengal

183 Archæology is still one of the least developed fields of Tibetan studies and prehistoric discoveries from Tibet are therefore rather rare.[1] Among them a type of glassy bead with various designs in black and white is encountered with comparative frequency; beads of this kind are still in use among the Tibetans and are highly prized as ornaments. They are called *gZi*[2] in Tibetan—a word which is also used in the sense of 'brightness' or 'splendour.' *GZi* are said to be found in all parts of Tibet, as well as in some of the neighbouring regions of Ladakh and Bhutan. According to Tibetan tradition, Bhutan was at one time the best-known source of *gZi*, but recently more extensive discoveries are reported to have been made in the East Tibetan province of Kham; the *gZi* found in Ladakh, on the other hand, are said to be mostly of inferior quality. Though no discoveries of *gZi* seem to have been reported from Sikkim and Nepal, *gZi* of Tibetan and Bhutanese origin are worn by Lepchas, the aboriginal inhabitants of Sikkim. Tibetan sources claim that the *gZi* are either found on alpine meadows—where they are sometimes eaten by grazing cattle and are thus later discovered in the dung—or, less frequently, are unearthed by peasants engaged in cultivation.

Two main types of *gZi* are distinguished by the Tibetans:

(A) Oval-shaped beads, up to three inches long, with alternating black and white, or brownish, streaks, and with white 'eyes' (*mig*), from one to 12 in number. Beads with five, seven, eight or 11 'eyes' seem, however, to be less common than those with one, two, three, four, six, nine, 10 or 12 'eyes.' A high number of 'eyes,' deep colours and a shiny surface increase the value of the *gZi*. Most of the beads found in Bhutan are said to belong to the type just described.

* *With a text figure*