STONE AGE INDUSTRIES NEAR GIDDALUR, DISTRICT KURNOOL

By K. V. Soundara Rajan

In 1949 the Prehistoric Expedition led by Professor F. E. Zeuner of the Institute of Archaeology, University of London, visited, among other sites, those near about Giddalur, a town in Kurnool District in the northern part of Madras State. The author of this article, a member of the Expedition, describes here the implements collected from these sites at the time of the visit. It should be noted that more than two decades back the lithic industries of the same area were studied and reported on by Burkitt and Cammiade, who came to the conclusions that there had been a cycle of pluviation and interpluviation in the region that might correspond to the Himalayan cycle of glaciation and interglaciation and that typologically the tools had striking similarities with those from south Africa. Both these conclusions are of far-reaching significance, and any fresh light on the industries is therefore welcome.

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1. INTRODUCTORY

The potential importance of south India in the elucidation of the origin and movements of prehistoric cultures was brought out more than two decades back by the discovery of unknown Stone Age cultures in south-east India by Cammiade and Burkitt. Their work, published in 1930,1 was based on observations made at a large number of sites in the region under study, though the tables of data produced by them

were from some four or five selected areas viz. the Bhavanāśī gravels, where a good cliff-section was obtained opposite the village of Krishnāpura in at the western entrances of the Dornālā-Atmakur pass of the Nallamalais; Yerrakonḍapalem, near the eastern entrance of the same pass; Gundla-Brahmeshvaram situated on the top of high mountain-valley on the bank of Gundlakamma river; and Giddalur, a town near the Nandikanama pass, past which two rivers, Sāgileru and Enumaleru, flow and meet.¹

This search, while bringing out four salient lithic cultures of different ages starting from the earliest handaxe industries of quartzite to the latest microlithic industry of agate and quartz, also revealed climatic changes characterizing the stratigraphic sequence represented at the different sites and their relationship with the changing tool-techniques and types involved in these industries and thus laid the foundation for the postulation of a pluvial cycle which was likely to have taken place in the Indian peninsula corresponding to the Himalayan glacial sequence demonstrated by De Terra and Paterson.

Further, the series of industries classified according to their technique and the état physique of the tools were shown by the authors to have almost similar counterparts in south Africa. Particularly a significant basis was found for a general correlation between the succession of climatic changes in these two widely separated areas. Thus, the alteration of pluvial and dry periods from the Early Palaeolithic times to the Mesolithic in both south-east India and south Africa appear to be strikingly similar as a result of these investigations.

This exploratory work was not followed up by a further examination of the problem until 1949, when the Prehistoric Expedition of the Department of Archaeology of the Government of India, led by Professor F. E. Zeuner, Geochronologist of the Institute of Archaeology, London University, and Shri V. D. Krishnaswami, was able to visit and study some of the sites mentioned by Cammiade. Among the sites visited were those around Giddalur, where a good collection of stone artefacts was made. While it will be too premature to dwell upon the climatological aspect of the problem in this area pending the report on the soil-examination and analysis by Professor Zeuner, a study of the general typological and technological characteristics of the recovered artefacts is recorded in the present paper by the author who collaborated in the expedition, and the palaeolithic and microlithic industries of the sites around Giddalur are discussed.

While Burkitt and Cammiade did not observe elements of their series III and IV around Giddalur, our collections do possess representatives of these two series also. The study of the tool-collection from these sites further indicates that while only series I and II of Burkitt and Cammiade are mainly found at Giddalur I, series III and IV are largely to be found at Giddalur II (Narasimhakonda), which has, however, a few elements of series I and II also. Excepting an Acheulian handaxe from the section in Giddalur II area (no. 23) and a parallelogram-sectioned cleaver of the Acheulian phase (no. 56) from the implementiferous zone of the Tālapalle section, the collection is all from the surface, either the river-bed or the top of the river-banks. At Kanchipalle and Tālapalle, the industries are representative mostly of series I, though the latter has a Middle Palaeolithic influence observable in its handaxe facies. Tools from both these sites are very heavily rolled.

### 2. PHYSIOGRAPHY AND GEOLOGY OF THE REGION

Two long ranges of hills, the Nallamalais on the east and the Erramalais on the west, divide Kurnool District north and south into three well-defined zones. The

¹It is unfortunate that exact locations of Giddalur ‘A’, ‘B’ and ‘C’ have not been given by Burkitt and Cammiade in their article.
easternmost of these sections, which includes the taluks of Cumbum and Mārkāpur, is about 600 ft. above sea-level and is very hilly. Throughout the greater part of its length a range of hills known as the Velikondas, a part of the Eastern Ghats, divides it from Nellore. Between this range and the Nallamalais to the west several low parallel ridges cut up the country into valleys, and through these linear ridges the hill-streams draining the eastern slopes of the Nallamalais have forced their way. Some of these gorges thus hollowed have been dammed for irrigation. The most picturesque of these is the Cumbum tank formed by an embankment across the Gundlakamma river. 'This fine sheet of water is about 5 miles long by 3 or 4 broad. It is nearly surrounded by picturesque hills and several rocky islets stud its bosom.' This river cuts a huge gorge between Cholliveedu and Turimella.

The chief rivers among the eastern section of the district are the Gundlakamma and its tributaries, the Rallavāgu, Tīgaleru, Duvaleru, Sāgileru etc., all rising in the Nallamalais. The Gundlakamma has its source near Gundla-Brahmeswaram and enters the plain through the gorge of Cumbum. The Sāgileru flows south and drains the country towards the Pennar in Cuddapah District. It is this river that flows past Giddalur town and has a tributary Enumaleru joining it near Tālapalle.

Geologically, Kurnool occupies the centre of a basin consisting of two great Azoic formations, namely, the Cuddappah and Kurnool systems, the latter series resting unconformably on the upturned edges of the former series. The eastern section, of which the country around Giddalur is a part, belongs to the Nallamalai quartzites. The central part belongs to the latter (Kurnool) system characterized by limestones and quartzites. The westernmost part belongs partly to the Cuddappah and partly, along the extreme west, to Archaean formations consisting of granitic rocks of no particular interest.

There is an intercalation of shales and quartzites in parts of the middle and eastern section of the Kurnool area. The Sāgileru plain, however, is occupied entirely by the middle Nallamalai (Cumbum) shales underlain by Viramkonda (Byrenkonda) quartzites. The Sāgileru shales are often quartzitic and more whitish or ash-coloured than those further north, which are grey or purple. They are highly cleaved oblique to the bedding planes and weathered along the cleavages into silvery platy bits.

3. THE SITES AND THEIR STRATIGRAPHY

A. GIDDALUR I

The cliff-section in the Sāgileru river by the bridge near Giddalur was the first site examined. This and the following two sites together will be called as Giddalur I in this paper. Here the river meanders, and where it strikes the opposite bank after swinging the section revealed above the water-level (in March) is basal weathered rock, upon which is a deposit of cemented gravel overlain by a layer of river-silt, and this again is superimposed by a loose pebbly deposition of a comparatively much later origin. The entire cliff is only 10 ft. high.


' There is an interesting occurrence, a mile east-north-east of Sanjīvaraopeṭa on the Giddalur-Cuddapah high road, of a N.W.-S.E. linear tract of country covered by a layer of rounded pebbles and blocks of quartzite and sand about 6 ft. thick above the Nallamalai shales. It was also revealed in a well-section west of Iyannapalle. 'Geology of parts of Kurnool and Cuddapah Districts', Geological Survey of India, Progress Report for 1949-50 (Sept. 1951).
South of the S.P.G. mission bungalow in Giddalur town on the Sāgileru the river-section shows gravel in a highly cemented condition lying in between the bed-rock and modern flood-loam (pl. XV A). The cliff is about 10-12 ft. above water-level, and on the top are observed a scatter of small chips of quartz and chert among which occur microlithic flakes.

Between the 80th and 81st mile-stone on the Giddalur road, north of the railway line and between the road and river Sāgileru, the high ground above the bridge-section contains a dense and extensive scatter of pebbly gravel lying in the undulations. A good number of handaxxes, cleavers and flakes was picked up here.

The occurrence of a consolidated gravel-bed in the lower levels and of a loose gravel-bed capping the sections on the high ground mentioned above may probably be indicative of two aggradational phases, and the phase of loamy sand in between may mean an arid condition, even though the coarse loose top-gravel phase may itself be regarded as an evidence of a comparatively dry condition, perhaps much less arid than the preceding sand-phase. This would suggest a progressively warmer climatic condition. The shaley bed-rock is, in its upper part, in a cleaved and weathered state, and its lower parts comprise a good laminated shale. Further, where the lower gravel-bed is found resting on the bed-rock itself, it is clear that the aggradation-cycle must have started while the river was flowing on the rock-bench.

B. GIDDALUR II

About a mile south and south-east of Giddalur town, near Narasimhakonda, is another site (indicated as Giddalur II), where also the section of the Sāgileru and its gullies contain the gravel-stratum. The implements were, however, found generally on the surface above the section. Near about this place but in greater frequency at the foot of the hill immediately to the east and again on the surface were picked up microlithic artefacts, some of indisputable shapes and appearance (below, p. 89).¹

C. TĀLAPALLE

Near Tālapalle village, about 5 miles south-west of Giddalur, a stretch of about a furlong of the river Enumaleru was studied. In the first section nearest to the village it is a very low cliff, not higher than 5 ft., the lower part of which is a pebbly layer, and the upper part consists of recent flood-loams (pl. XV B). At this place the flood-plain terrace in the bed is entirely covered with a dense gravel-spread teeming with implements mostly rolled. They contain essentially series I tools and seem to come down from heights during a pluvial phase, carried down and deposited as detrital pebble-beds devoid of stratification. Farther away from the village, where there is a swing of the river, the cliff-section is a well-stratified deposit as much as 20 ft. thick. The cemented gravel-layer here is of a thickness of 6 ft., in which a good large-sized cleaver of parallelogram cross-section and pebble-butt (no. 56) was noticed in situ.

The sequence of deposits from top to bottom is as follows:—modern flood-loam, about 5 ft. thick, underlain by reddish earth with kankar-deposit, which immediately overlies the cemented implement-bearing gravel-bed, itself resting upon the basal shaley rock exposed to a height of 4 ft. above the then water-level and having a marked obliquity towards the east.

¹This Giddalur II area deserves a more intensive study for a greater clarification of stratigraphical and climatological data.
D. Kanchipalle

Three miles west of Giddalur and about half-a-mile south of Krishnansettipalle is the site Kanchipalle marked by a gully probably pertaining to the Enumaleru river. The gully is full of huge rolled pebbles and flakes essentially of Clactonian technique. A few Abbevillean-looking tools with pebble-butt and one good Acheulian pyriform handaxe were noticed among the pebble-scatter there. There is no section available at the gully, and a well-section nearby reveals only soil over shales.

4. TYPOLOGY OF THE PALAEOLITHIC INDUSTRIES

A. Giddalur I

The collection made from the site Giddalur I contains essentially tools belonging to the series I and II of the classification of Cammiade and Burkitt. But at the same time one can divide them on the basis of *état physique* as well, and it is noticed that almost invariably the earlier tools such as the Abbeville-Acheulian handaxes and the rostocarinate are more rolled than the evolved Acheulian coups-de-poing and cleavers and other flake tools. One of the important features noticed in the collection is the occurrence of the rostocarinate and 'Victoria West' forms (nos. 1 and 2 respectively) among the specimens of the earlier series. These implements, made out of pebbles, as is very apparent by the cortical patches often preserved on them, have been boldly flaked and have irregular rims. The rostocarinate particularly are of the largest size (8 in. to 10 in. in length and 4 in. to 6 in. in width) and have a flat ventral plane and a keel-like dorsal surface with a high cortical-patched butt-end. These features were noticed by Mr. Burkitt here as well as at Chodavaram. The Victoria West type, which assumes its name from its having been first noticed at Victoria West in South Africa, has the special feature in the ventral surface being formed almost entirely by the removal of one single flake and the tool having a pointed end. Owing to the first-mentioned feature the tool has a mildly crooked tip-end also. The occurrence of this type in south-east India is considered by Burkitt as of extreme importance and as a sure indication of the connexion existing between this region and south Africa. In south Africa this tool, though Lower Palaeolithic in date, is connected with the first appearance of flake industries.

Pebble choppers with both unifacial and bifacial flaking are also present. While at Giddalur I they are mostly on irregular and full pebbles recalling the Kafian or Oldowan counterparts, at Giddalur II they are made often on split pebbles and resemble closely the Sohan pebble chopper-chopping tools of north-west India. It would indeed be interesting to ascertain the technological 'increment' in these two pebble tool-types in the Abbeville-Acheulian assemblage in this area from collections made *in situ*. At the same time, their low percentage compared with the prolific variety of biface cleaver forms in the industry might suggest the pebble-element as an autochthonous and integral part of the main core-tool tradition of the south.

There is a good representation of Abbeville-Acheulian tools which are characterized by irregular or wavy margins, remnants of cortical patch in the butt-end in many cases and an almost elliptical cross-section. Often both the dorsal and ventral sides have a mid-rib, but in almost all the cases the tip is pointed. A majority in this group is in a much rolled condition.

The next important group consists of ovoid tools (nos. 10 and 11) and flake-made handaxes (e.g. no. 7), presumably of the middle to late Acheulian period. The ovoids range from narrow and elongated specimens with jagged rims and elliptical cross-sections
to those which are very wide and almost discoid in shape with fairly well-chipped sides, straight rims and lenticular cross-section. The handaxes include extensively chipped pear-shaped specimens (nos. 8 and 9), the tips of which are sharp and pointed and which have a biconvex cross-section. These have a comparatively much fresher look than the Abbevilleo-Acheulian group mentioned above and are much lighter in weight and more regular in shape. There are also two broad-ended handaxes (e.g. no. 12) which would have to be ascribed technically to this group and which form, as it were, the transition-group between handaxes and cleavers in the middle Acheulian period. These have a thick pronounced butt-end and narrowing body, ending, however, in a narrow cleaver-like straight edge.

There is a fine group of cleavers which either are ordinary bifacially-chipped ones (e.g. no. 13)—the descendants of the two specimens mentioned above—or are the results of single Vaal technique of cleaver-edge-making with a rather squat, almost semi-circular shape (e.g. no. 14), or of the double Vaal technique with parallelogram cross-section. Among the last-mentioned group there is one tool (no. 15) which is a text-book specimen, as it were, of the double Vaal technique, owing to its most carefully chipped margins containing the flake-scars on either side and a most regular parallelogram cross-section and a cleaver-edge obtained as a result thereof.

The advanced Acheulian coups-de-poing are represented by a group of four specimens (e.g. nos. 8 and 9), which are extensively chipped on both sides and are of a regular shape with a pointed tip and biconvex cross-section. One of these (no. 9), though well-made, is of small size.

As far as our collection goes, Giddalur I does not have any Levallois flakes. The flakes are all Clactonian in technique and range from large and oblong ones with a smoother ventral flake-side, a prominent bulb and occasional ripples to a few small ones which are roughly triangular in shape and have been the result of either straight hits on top or oblique hits from across the sides. Some of the flakes have a serrated edge perhaps denoting use, and one of them has got a wide notch on the side which may indicate its having been used as a hollow scraper also.

The cores are all Clactonian cores, largely of the biconical or discoidal types (e.g. no. 16) of medium to small sizes. Among them are two scrapers (nos. 17 and 18), both of them of the hollow scraper variety, with the functional notch much battered probably due to utilization.

The rest of the collection consists largely of a miscellaneous group of waste flakes and rejects discarded during the process of the fabrication of actual tools.

There is one single specimen of a bladish flake on greenish quartzite of plano-convex section with flat underside and parallel margins. It is either broken or was deliberately truncated, as the bulbar and the tip portions are absent. This should actually belong typologically to the series III of Burkitt, and it has probably strayed into the Giddalur I site by accident and thus may have nothing to do with series I of this site.

It is apparent from the composition of the collection that the prominent groups in this site would be those of the Abbevilleo-Acheulian bifacial industry with a pebble-tool accompaniment and a Clactonian flake-technique.

B. GIDDALUR II

While in the collections from Giddalur II also the tools of the Abbevilleo-Acheulian facies are represented, it must be mentioned that the tools are all comparatively smaller in size, rostrocarinates and Victoria West types are absent and a certain proto-Levallois and Levallois trend in flake-making is present, which shows an advanced industry. A
feebly represented group of coarse burinate flakes, three in number (e.g. nos. 36 and 37), and another better represented group of blade tools and bladish flakes, five in number (e.g. nos. 38-40), would seem to accentuate, from the typological point of view, the development noticeable in the industry. Most of the flakes (Clactonian and Levallois) and the scrapers are quite small and would seem, on the whole, to be part of an Upper Palaeolithic assemblage. Levallois and proto-Levallois flakes together almost equal the Clactonish flakes. Even of the cores a majority is of less than average size of a normal residual core of a Lower Palaeolithic industry.

This would mean that in Giddalur II site we have an industry essentially pertaining to the series II and III of Burkitt and Cammiade along with representatives of series I. As will be seen (below, p. 89), series IV also forms a distinctly prolific group at and near Giddalur II site. The view expressed by the scholars mentioned above (p. 66) that when admixtures from series II and IV are eliminated series III industry appears very poor, while series IV industries are individually rich, seems to some extent to be corroborated by the collections under review, even though the blade-element seems to have been sufficiently represented in our collection.

While the industries of series I of Giddalur I are very much rolled, the corresponding artefacts in Giddalur II appear to be comparatively more fresh-looking. This may imply that the earlier facies of Giddalur II would belong typologically to the end of series I and the beginning of series II, as further suggested by their much smaller size and better workmanship. Of the eight tools in the Acheulian group in Giddalur II, three (e.g. no. 24) are made on flakes; and of these one (no. 26, unfortunately half-broken) is of a very thin cross-section and would seem to possess an ‘S’-twist. Of the rest one has a broad cleaverish end, while most others (e.g. no. 35) have tongue-shaped ends. Of the four cleavers, two (e.g. no. 27) are made on flakes and have a straight edge formed by a single Vaal blow; of the other two, one has an oblique cutting-edge, and the second (no. 28) is an exquisitely made triangular-shaped cleaver having a fine parallelogram cross-section, obtained by double Vaal blows and exhibiting a fine secondary trimming; the cleaver-edge appears to be worn out by utilization.

It is possible to classify the flakes and flake tools into two clear groups on the basis of size, material and workmanship. Thus, those of series II are made of the same brownish quartzite like the mass of the handaxes and are invariably bigger in size without much of secondary trimming in most cases; the other group consists of tools smaller in size and is made on greenish shaley variety or on lydianite. These tools are either slender blades with backing on one side or side- and end-scrappers with steep secondary retouch along the working-edges. While Levalloisean technique is apparent on many of these (e.g. nos. 29-33), there seems to be indications of punch-technique also, as is seen from the long slender slices removed from the surfaces of some of the flakes. There are, besides, five specimens (e.g. nos. 34 and 38-40) of what must be called bladish flakes. A few coarse burinate tools available would also belong typologically to this series III.

C. TALAPALLE

The collections from the Enumaluru river-bed near Tālapalle have in the main Abbevilleo-Acheulian characteristics, and the tools are large-sized and boldly flaked with very little of stepped flaking perceivable. The material is almost entirely of quartzite, save for a few specimens which are of sandstone, probably quartzite metamorphosed due to long weathering. The entire bed was scattered with pebbles and artefacts, and except some of the flake implements all the tools in the collections are heavily rolled. There is one large-sized pebble chopper much rolled with jagged edge along a part of the periphery.
One of the Abbevillian handaxes (no. 48) is made from a very large-sized pebble about 9 in. long and 6 in. wide and is worked with bold flakes with deep scars bifacially with a resultant rhomboid cross-section owing to the mid-rib on either side.

Side by side with Abbeville-Acheulian bifacial handaxes with or without pebble-butt there is also a persistent element of flake-made handaxes (e.g. no. 51) fabricated on large-sized flakes and with their upper part only slightly trimmed into a handaxe shape. There is a feeble representation of Victoria West type (e.g. no. 54). The Abbevillian series alone manifests the gradual development in itself. There are tools with pebble-butt and only ends slightly flaked into a sharp point. There are others (e.g. no. 50) which have an almost lancelolate upper part and lower pebble-butt, and again we have those (e.g. no. 49) which have a narrow cutting-edge rather than a tip-end with rough parallelogram cross-section and thus stand technically in between bifacial handaxes and cleavers. There are a few ovoids (e.g. no. 53), some of which have a laterally inverted 'S'-twist along the sides. Rolled and unrolled cleavers of both ordinary bifacial flake-technique as well as Vaal technique are found. One of these (no. 56), picked up in situ from the implementiferous gravel-stratum in the cliff-section of 20 ft. height mentioned above (p. 68), is a boldly flaked tool with neat double Vaal blows resulting in a sharp cleaver-edge and a parallelogram cross-section; it has a pebble butt.

The flake tools include fairly retouched side-scrapers and two good specimens of the hollow scrapers (e.g. no. 57); spoke-shaves as van Riet Lowe calls them, and the flakes are big and small, discoid and tongue-shaped. One of the flakes (no. 59), which is of a triangular shape with retouched edges, appears to have the platform somewhat prepared though still obtuse-angled. There is one flake tool (no. 60) in which both the upper and the lower sides are formed by major flake-scars with a positive and negative bulb, and thus it is of a concavo-convex section and with a plain striking-platform. The broad edges at the lower part of the flake have been worked by secondary retouch into a useful scraper. This specimen may very reasonably be a precursor of the true Moutserian and would be placed typologically in a Middle Palaeolithic industry.

Mention has been made of the emphatic presence of handaxe-like tools which have on the underside the flake-scars and the bulbs. This would indicate that the Tâlapalle industry is a mixed one because this feature demonstrates a Middle Palaeolithic influence acting on a Lower Palaeolithic industry. In the present state of our knowledge we are not able to fix the relative age of these tools in comparison to other truly Lower Palaeolithic Abbeville-Acheulian tools. The south African counterparts to these types and particularly flake-made tools are found at Middledrift (Cape Province) in Stellenbosch industry at Cofimvaba (Transkei) and near Process Bridge in Orange Free State. These have been shown to belong to the Middle Palaeolithic by the evidence from Taungs, where clear stratigraphical superposition reveals the following sequence: Lower Palaeolithic, Middle Palaeolithic and Smithfield. The occurrence of similar specimens in our collection, unduly rolled and in most cases with pebble-cortex and with the upper side not showing very neat trimming, would show that here it is the influence of a Middle Palaeolithic industry on the Lower rather than the presence of a Middle Palaeolithic industry itself.

This element in the Tâlapalle industry together with the concavo-convex flake scraper and the Levallois-like flake tool would tend to place it in the stage which would mark the end of series I and the beginning of series II.

1 While this would appear to have its analogies in the south African Smithfield A tool-type, it cannot belong to that industry which is much more modern than the main industries we are dealing with here and which, as Burkitt feels, is an autochthonous growth with a restricted distribution in south Africa and the result of a contact between the Fauresmith and the Wilton cultures.
D. Kanchipalle

The Kanchipalle industry essentially comprises series I. Abbevillian handaxe-like tools and large-sized Clactonian tools, both of them heavily rolled and both retaining for the greater part of the body the cortical patch, form the chief features. The cores are also rolled and Clactonish. Nevertheless, truly Acheulian feature is present in the industry as represented by one single regular Acheulian pyriform handaxe (no. 62) bifacially chipped with secondary trimming along the edges and biconvex cross-section, though with a flattened cortical butt-end. There are also among the flakes a few which have the cortical patch non-existent owing to the primary or secondary preparation. The entire gully-site is littered with large heavily rolled pebble artefacts and flakes of the Abbevillo-Acheulian facies. Its rolling is perhaps due to its transport from higher regions down into shallow shingle-beds. It is this earlier bifacial industry that again forms a prominent feature of the dense pebble deposit found in the bed of the rivers themselves, as near Tālapalle on the Enumalur.

Representative tools from each of the four sites are described below.

*Inventory of palaeolithic tools from the four Giddalur sites*

<table>
<thead>
<tr>
<th>Types</th>
<th>Giddalur I</th>
<th>Giddalur II</th>
<th>Tālapalle</th>
<th>Kanchipalle</th>
</tr>
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<tbody>
<tr>
<td>Pebble tools</td>
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<td>3</td>
<td>1</td>
<td></td>
</tr>
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<td>Rostrocarinates</td>
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<td></td>
<td></td>
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<tr>
<td>Victoria West</td>
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<td>9</td>
<td>3</td>
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<tr>
<td><strong>Total</strong></td>
<td><strong>80</strong></td>
<td><strong>90</strong></td>
<td><strong>51</strong></td>
<td><strong>19</strong></td>
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Waste flakes excluded.
5. DESCRIPTION OF THE PALAEOLITHIC TOOL-TYPES

A. GIDDALUR I

(i). Handaxes and pebble tools (figs. 2 and 3; pls. XVI and XVII)

1. This is a good specimen of a rostrocarinate about 8 in. long, the underside of which has a flat surface formed entirely by a single flake-scar and the upper side of which is made into a pointed end by bold bilateral scars resulting in a middle ridge or keel with a hump formed at the butt-end retaining the cortical patch. There is no secondary working. Burkitt refers to good examples of this type.

2. This is a specimen exhibiting the Victoria West technique, made on a medium-sized ovoid pebble. Its upper side has a cortical butt-end and flaking around the rest of the periphery, ending in a slightly curved though pointed tip. A big flake removed by a knock from across the right side formed the major part of the ventral side. It is this big flake-scar which has given the crooked tip to the tool. Burkitt has mentioned good specimens of Victoria West types similar to this one in his collection, but, while in his specimens the bulbar scar is on the left margin of the ventral side, in the specimens in our collection it is on the right margin.

3. A pebble chopper on a weathered quartzitic pebble with bifacial chipping resulting in a more or less straight edge across. The edge shows signs of use.

4. A handaxe made on weathered ovoidal quartzitic pebble, the lower part of which is almost entirely made up of the cortical portion on both sides and the bold bifacial chipping along the rest of the periphery has resulted in a wavy cutting-edge and median ridge ending in a fairly pointed tip.

5. A handaxe made on a medium-sized flattish greenish quartzite. The ventral side is fully flaked and the dorsal side has peripheral flaking and retains a weathered cortical patch on it. It has a meagre pebble butt. Secondary chipping along the periphery has resulted in a more or less straight cutting-edge. It has a sharp and wide working-end.

6. A medium-sized Acheulian core handaxe on greenish quartzite with bifacial primary and secondary flaking and a sharp tip. The tip-end exhibits the same alternate removal of flakes on opposite sides.

7. Acheulian handaxe on a flake with a flattish and thick butt-end, fairly sharp and straight sides and tapering tip. It exhibits bold flake-scars on the body as well as stepped flaking along the periphery.

8. Finished advanced Acheulian coup-de-poing with the ventral side produced largely by a single flake-scar, which has mostly been removed by secondary stepped flaking, with an elongated tip.

9. Diminutive Acheulian handaxe in greenish quartzite with straight sides and pointed tip. Stepped flaking apparent all round the edges.

(ii). Ovates (fig. 3; pl. XVII)

10. Finished ovoid exhibiting single Vaal flake-scar on the ventral side, though secondarily chipped and hence belonging to the middle Acheulian. The tapering end is thicker than the broad end, and it is this which prevents its being classified as a handaxe.

11. Another finished ovate tool with both surfaces extensively chipped and the edges also worked by secondary stepped flaking to produce a straight periphery and thus having a broad biconvex cross-section. This must belong typologically to the middle-late Acheulian bifacial culture.
Fig. 2. Palaeoliths from Giddalur I: handaxes and pebble tools. 1/3
12. This tool represents the transition between the bifacial handaxe and the cleaver. It has the general appearance of a handaxe but has a broadish edge at the bottom instead of a tip, and this edge is formed by a blow from the lower part of one of the edges, which would detach one single flake across resulting in the edge. In other words, it is the forerunner of the cleavers made by the Vaal technique. On the dorsal side there is a mid-rib in the lower part, and thus the cross-section of the lower part of the tool is a parallelogram. The butt-end retains a meagre cortical patch.

13. This represents one of the three types of cleavers available at Giddalur, the other two being represented by the two succeeding specimens. Its dorsal side is extensively chipped and has thicker upper portion and the edges show stepped flaking. The ventral side has a large unique flake-scar almost all over the side by a blow from the right-hand edge, the bulb of which, together with the upper edge, has been removed by secondary flaking. Thus it has a broad and sharp cleaver-edge. On the whole it is made by a technique
Fig. 4. Palaeoliths from Giddalur I: 12-15, cleavers; 16, core; 17 and 18, core scrapers.
similar to that of the coup-de-poing. There is a corresponding type of tool distinguishing the Stellenbosch industries of South Africa, and similar examples can be seen in the tools from Villiersdrop and Middle drift, as illustrated by Burkitt.

14. This is a Vaal or Pniel river variant of the cleaver technique. It is, however, a squat and horseshoe-shaped tool with a beautifully chipped dorsal side. The lower part of the ventral side is a smooth single flake surface formed by a blow from the side. The thick butt-end has been neatly trimmed in a curved fashion on the ventral side by secondary working. The dorsal side has meagre cortical patches in the upper part. The broad cleaver-edge is serrated probably due to use.

15. This is one of the most exquisite cleavers ever to be picked up and is a veritable text-book specimen of an ideal double Vaal cleaver. Either side has a smooth triangular flake-surface with controlled marginal reversed flaking, so much so that the cross-section of the tool at any place is a parallelogram. The cleaver-edge is battered due to use.

(iv). Core and core-scrappers (fig. 4; pl. XVIII)

16. This is a discoidal Clactonian core which has an equatorial jagged edge owing to the removal of alternate flakes, the upper side having a cortical patch in the middle.

17. This is a hollow scraper on a core. The broad upper edge has a functional notch and battering due to use. The rest of the margin also shows secondary working for a scraper-edge.

18. This is another hollow scraper on a core but with a much narrower notched scraper-edge. It is of pinkish brown quartzite almost metamorphosed into sandstone.

B. Giddalur II

(i). Pebble tools and handaxes (fig. 5; pl. XIX)

19. This is a chopper on a round pebble which has just a flattish cortical patch at the base for grip and the rest is bifacially chipped extensively so as to form a straight cutting-edge constituting a major arc of a circle. The flakes have all been removed from the cutting-edge in a direction away from it. The material is brown quartzite.

20. This is a split-pebble chopping tool strongly reminiscent of its Sohan counterpart, which has a flattish underside formed of negative bulbs all around the periphery and the dorsal periphery also chipped with secondary trimming into an effective working-edge with the central part of the tool flattish. The material is brownish quartzite.

21. This is a bifacially chipped handaxe with a pebble butt, which has on one of the sides a major flake-scar (though not very large or deep) removed from across the left margin and is the one nearest in approach to the Victoria West type, though not a typical one, in the industries from Giddalur II. It is made on reddish brown quartzite, almost changed into sandstone.

22. This is again an Acheulian handaxe with a flattish lower side with a hump on the middle of the upper side and a mid-rib from it towards the tip. The tip-portion is tongue-shaped. Part of the upper left side near the grip-end has a cortical patch.

23. This is a small ovoidal handaxe on greenish quartzite with an almost straight peripheral cutting-edge and secondary stepped flaking and a slightly curved tip. This was a tool found in situ.

24. This is a small early middle Acheulian handaxe made of brownish quartzite. It has a sharp and more or less straight cutting-edge all around except near the butt-end, which has a small cortical patch and has a thin tongue-shaped tip-end.
Palaeoliths from Giddalur: 19 and 20, pebble tools; 21-25, handaxes; 27 and 28, cleavers (26, flake-made tool, not illustrated)
A. Palaeoliths from Giddalur II: 29-35, prepared platform (Levallois) flakes; 36 and 37, coarse burinate flakes; 38-40, bladish flakes

B. Palaeoliths from Giddalur II: 41-46, unifaceted (Clactonian) flakes (47, core, not illustrated)
Fig. 5. Palaeoliths from Giddalur III: 19 and 20, pebble tools; 21-25, handaxes; 26, flake-made tool; 27 and 28, cleavers. 1/4
25. This is a small pear-shaped handaxe made on a flake with a battered platform at the butt-end, the flake-surface entirely covering the ventral side. A flake removed on the dorsal cortical side near the tip has resulted in a sharp thin edge.

26. This is another flake-made tool with cortical patch forming a major part of the dorsal side. Unfortunately the tool was broken into two, and as only the upper half is available to us it is not possible to say whether it is a handaxe or an ovate. The ventral side is formed of the flake-scar; the bulb has been removed by secondary trimming, and very deep stepped flaking is apparent around the periphery. Besides, a special feature of the tool is that looking at it sideways one is able to notice that it seems to have the ‘S’-twist.

(ii). Cleavers (fig. 5 ; pl. XIX)

27. This is a cleaver, the edge of which has been the result of a single Vaal blow struck from the right-hand margin of the ventral side. The margin has been secondarily trimmed throughout the entire length, and this has resulted in a roughly parallelogram cross-section. The dorsal side has a patch of pebble cortex near the lower right end and has a flake removed near the lower edge to meet the ventral flake in a straight cutting-edge.

28. This is a fine specimen of a triangular-shaped cleaver, made on the double Vaal technique and thus has a regular parallelogram cross-section. Secondary stepped flaking has provided the tool with a pointed tip. The straight cutting-edge is notched, probably due to utilization.

(iii). Prepared platform (Levallois) flakes (fig. 6 ; pl. XX A)

29. This has a regular faceted striking-platform and a suffused bulbar scar. All along the margins secondary retouch is visible making it a useful scraper. The material is weathered brownish quartzite.

30. A small broad tongue-shaped flake with a broad prepared platform and suffused bulb, mid-rib on the dorsal side and sharp edges.

31. This is a bigger tongue-shaped flake with the platform removed by secondary working. The ventral side is of a flat flake-scar and the entire periphery on the dorsal side has steep secondary retouch which has turned it into a very efficient side-cum-end scraper. It is made of brownish quartzite almost turned into sandstone by weathering.

32. This is a small beautiful flake tool which has been turned into a double end-scraper by the steep retouching of the platform-end as well as the alternate dorsal bottom-edge. Particularly the latter has been nicely trimmed into a ‘nosed’ end-scraper with ‘nibbled’ retouch recalling its Upper Palaeolithic ‘Aurignacian’ counterparts.

33. This is a nice little flake with a broad and battered platform and ‘eraillure’ on the ventral side. The flake tapers towards the tip-end which is thick due to the central mid-rib (on the dorsal side) and has steep retouch at the end and is thus efficient as an end-scraper.

34. This is a unique flake of true bladish aspect with an almost deliberate backing along one margin and sharp serrated edge on the other. Both the upper and the lower ends seem to be truncated and thus the direction of the knock or the platform is not discernible; but it is likely to be on the less flattish end. This is a knife-blade and with the truncation of its bulbar scar and backing would be a clear example of the element of Upper Palaeolithic culture in Giddalur II industry in spite of its slightly bigger size.

35. This is a small specimen made on-likeite (which is the material partly used for series IV and occasionally for series II in Kurnool). It has a prepared platform and negative flake-scar on the ventral side. The entire peripheral edge of this side is steeply
Fig. 6. Palaeoliths from Giddalur II: 29-35, prepared platform (Levallois) flakes; 36 and 37, coarse buriniate flakes; 38-40, bladish flakes. 3/8
retouched and serrated, and the flake would thus be an effective scraper. This would belong typologically to a stage between series III and IV.

(iv). Coarse burinate flakes (fig. 6; pl. XX A)

Nos. 36 and 37, together with a third example, not illustrated, which seems to be a case of the removal of a single spall, with the rest of the edge minutely retouched, obviously indicate the existence of burins, though there is no really good specimen of the type in our collection of the series III industry of Giddalur.

36. This is a specimen probably of a central (angle) burin type and has two opposing spalls removed across the main plane of a thin quartzitic flake giving a restricted burin-edge.

37. Another specimen perhaps of the same type as no. 36.

(v). Bladish flakes (fig. 6; pl. XX A)

38. This is a squarish flake with both ends truncated and with a mid-rib on the dorsal side and with serrated edges on both sides. It is perhaps a knife-blade. This would typologically belong to series III.

39. This is another bladish flake with thick flattish back serrated saw-edged side and steeply retouched lower end. It is on pale bluish quartzite.

40. This is a trapezoidal flake on greenish quartzite with the smaller parallel side backed and the broader one much serrated. This is an indication and forerunner of the trapezoids of the microlithic series and would typologically belong to the end of series III. It should, however, be mentioned here that our microlithic collections do not contain any example of trapezoids.

(vi). Unifected (Clactonian) flakes (fig. 7; pl. XX B)

These range from medium to big flakes with obtuse striking-platforms and prominent bulbs made mostly on brownish quartzite to small ones on bluish or greenish quartzite. Of the fifty-four specimens in the collection thirty-five would belong, in respect of size and material, to series II and the rest to series III. There are many among these which have clear secondary retouch so as to be functionally useful as scrapers.

41. This is a small tongue-shaped flake with a mid-rib on the dorsal side formed by an oblique platform and opposite bulbar face, and with the bulbar scar and the entire periphery on the ventral side having secondary retouch. The material is bluish quartzite, which is largely the material used for these specimens of series III.

42. This is a medium-sized flake made on pale brownish quartzite with a mid-rib, a restricted flat platform and‘eraillage’, and with the side-edges steeply retouched to serve as a side-scraper.

43. This is a side-blow flake, the dorsal left edge of which has been secondarily trimmed to serve as a side-scraper and has a notch on bottom left which might have served as a hollow scraper-edge.

44. This is a thick tongue-shaped flake on bluish quartzite. It is broad near the platform but the lower nose has fine nibbled retouch for efficient use as an end-scraper. It recalls the Aurignacian nosed ‘grattoirs’. The side-edges are also retouched so that the flake is useful also as a side-scraper.

45. Another but thinner tongue-shaped tool flaked on bluish green quartzite with an ‘eraillage’ on the ventral side, sharp side-edges and steep retouch at the bottom-end, useful as an end-scraper.
Fig. 7. Palaeoliths from Giddalur II: 41-46, unifaceted (Clactonian) flakes; 47, core.
46. Rectangular flake in greenish quartzite with a functional notch at the lower end and thus useful as a hollow scraper.

(vii). Core (fig. 7)

47. This is a small elongated coroid lump of greenish quartzite with a hinged flake-scar at one end and with a series of thin flakes removed at the other end apparently by pressure-flaking. The result is evidently a scraper-edge. Similar scrapers, though on flakes, are seen to occur in the Aurignacian level at Mugharet-el-Wad, Mount Carmel, Palestine. By the presence of pressure-flaking detectable on this, its place would be at the end of series III and the beginning of series IV.

C. TALAPALLE

(i). Handaxes and ovates (fig. 8; pls. XXI and XXII)

48. A typical and giant Abbevillian handaxe which could only have been wielded by both hands, made on brownish quartzite. It has a large and thick butt-end, very prominent mid-rib on one side and hump on another and is boldly flaked from the margin resulting in a rough rhomboidal cross-section. It has a blunt tip-end. It measures about 8½ in. in length and about 5 in. in width. The tool has comparatively fresh-looking flake-scars and appearance.

49. Early Acheulian core tool with a large pebble-but and tapering sides neatly chipped into a straight shape by stepped flaking and with a limited cleaver-edge instead of a tip. The tool has a rhomboidal cross-section and marks the transition between bifacial handaxes and cleavers. The material is brownish quartzite.

50. Acheulian core handaxe with a weathered cortical butt and fairly straight sides trimmed by stepped flaking. It tapers into a lanceolate, though blunted, tip-end recalling the ‘Micoquian’ coups-de-poing of Europe. It is made on bluish quartzite and has a rolled appearance.

51. A handaxe of regular pyriform shape on a flake with the ventral side formed by the flake-surface entirely and only the dorsal trimmed to shape. It has a roughly plano-convex cross-section. Indicative of a Middle Palaeolithic influence over a Lower Palaeolithic industry, this forms a significant group in the Talapalle industry. The material is brownish quartzite and the tool looks rolled.

52. This is another flake-made handaxe on greenish quartzite. It is, however, bifacially chipped with the edges showing fine resolved flaking. On the ventral side the bulbar scars have been removed by secondary trimming and a few more flakes have been removed along the edges. The tip, which must have been pointed, is unfortunately broken. The trimming of the edges shows a laterally inverted ‘S’-twist along one side. Slightly rolled.

53. This is a fairly regular ovate made on greenish shaley quartzite with the straight periphery exhibiting marks of stepped flaking and looking much battered. The ventral side has a flattish flake-scar, though the upper part including the bulb is trimmed away. This flake-surface is obtained particularly by a single Vaal blow, and thus the tool is thinner in the lower part.

54. This specimen, made on greyish brown quartzite, is the only one exhibiting the Victoria West technique, with an extensively chipped dorsal side and the ventral

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Palaeoliths from Tālāpalle: 48-50, 52 and 54, handaxes and ovates; 55 and 56, cleavers
Paleoliths from Tilabbale: 51 and 53, handaxe and ovate; 57-60, flakes and flake tools.
STONE AGE INDUSTRIES

Fig. 8. Palaeoliths from Tālapalle: 48-52 and 54, handaxes; 53, ovate.
side having a major deep negative flake-scar. The side-edges, though wavy, are trimmed by stepped flaking. The tip is slightly curved.

(ii). Cleavers (fig. 9; pl. XXI)

55. This is a rolled specimen of an ordinary cleaver-type made by the bifacial technique on very similar lines as the handaxe but for a side-blow from one of the edges. It has a humped middle part on both sides and has thus a roughly rhomboidal cross-section. The cleaver-edge is rather oblique ("guillotine"-like) either due to differential wearing or in the original tool itself. This tool would typologically correspond to the early Acheulian bifaces. It is brownish quartzite almost metamorphosed into sandstone.

56. This is a tool which was found in situ in the 20 ft. section on the Enumaluru river near Tālapalle (above, p. 72) and is an excellent example of a cleaver-type exhibiting double Vaal technique and thus having a parallelogram cross-section. It has a rounded pebble-butt and is boldly flaked and not fully finished. It is made on pale brownish quartzite and has the stain of the reddish silt-deposit, at the junction of which with the underlying gravel-bed it lay. The tool is in a perfectly fresh condition with sharp side and lower edges.

(iii). Flakes and flake tools (fig. 9; pl. XXII)

57. This is a typical specimen of a hollow scraper (or spoke-shave) on a Clacton flake. It is triangular in shape, and the flake-surface, with a positive bulbar scar on the underside, is caused by a side-blow from right. The lower end has the functional notch showing slight retouch also. The upper surface is also a flake-surface caused by a side blow from left, again with a positive bulbar scar. There is a slight trimming of the sharp right margin also, so that the tool could serve as a side-scraper as well.

58. This is a small Clacton flake, which tends to be a proto-Levallois flake tool owing to its upper surface being trimmed to some shape and also to the steep secondary retouch all along the edges of the flake except in the meagre platform-side. The flake is narrower near the platform and broader at the lower edge. The powerful blow that fell on the platform is suggested by the ripple on the ventral flake-surface.

59. This tool, with its beautiful and symmetrical triangular shape and a somewhat prepared platform, would seem to be an advance upon no. 58. The left margin and a part of the right near the sharp tip show steep secondary trimming. This would tend to be placed in the Middle Palaeolithic and would be a forerunner of the true Mousterian.

60. This is a rather unique and solitary example of what is called a 'concavo-convex scraper'. It consists of a negative flake-scar on the upper side and a positive bulbar scar on the underside struck along the same platform. The two broad tapering sides opposite to the bulbs are steeply trimmed and they meet in a 'nose' which shows nibbled retouch. The platform is not straight but angular. Perhaps a forerunner of the 'Mousterian'.

D. KANCHIPALLE

(i). Handaxes (fig. 10; pl. XXIII)

61. This is a heavily rolled Abbevillian tool, probably a handaxe, the heavy butt of which has much of cortical surface and the upper edges have bold bifacial flaking. The tip is blunt. Brownish quartzite.
Fig. 9. Palaeoliths from Talapalle: 55 and 56, cleavers; 57-60, flakes and flake tools.
62. Beautiful and regularly chipped early middle Acheulian handaxe with an almost straight edge all around, with mid-rib on both sides but with flattened and thin tip-end and with a flattish cortical butt-end. Stepped flaking is apparent along part of the edge.

(ii). *Flake* (fig. 10; pl. XXIII)

63. Tongue-shaped Clactonian flake with a broad and right-angular striking-platform. The bulb has partially been removed by a side-blow given near it on the left, apparent from the negative scar of this blow. The edge shows battering, probably due to collision in transport. The dorsal side is entirely made up of cortical patch.

**Fig. 10.** *Palaeoliths from Kanchipalle*: 61 and 62, handaxes; 63, flake; 64, core.

(iii). *Core* (fig. 10; pl. XXIII)

64. Clactonian core in a fresher condition than with a flattish lower surface formed of marginal negative flake-scars and with a high hump on the upper side, which also retains a cortical patch.
Palaeoliths from Kanchipalle: 61 and 62, handaxes; 63, flake; 64, core
Microliths from Giddalur II: 65 and 66, parallel-sided blades; 67-69, backed blades; 70 and 71, lunates; 72 and 73, scrapers; 74 and 75, almond-shaped points; 76-79, tanged points; 80-82, burinate tools; 83, obliquely blunted point
6. THE MICROLITHIC INDUSTRY OF GIDDALUR II

A. THE MATERIAL AND TYPES

Quartz veins occur in all horizons in the Nallamalai range but are most conspicuously displayed in the Ságileru plain, where they come to the surface for miles from north to south in white ridges, reefs and their debris. The veins are milky white in colour.

The microlithic industry of Giddalur II is characterized by (i) parallel-sided blades (eight), (ii) backed blades (nine), (iii) lunates (three), (iv) side- and end-scrapers (three), (v) borers (two), (vi) almond-shaped points (nine), (vii) tanged points with single and double shoulder (four), (viii) burinate tools (seven), (ix) obliquely blunted point (one) and (x) cores (ten). A majority of the tools has been made on vein-quartz of the milky variety, while the remainder is variously made on greenish quartzite, banded or mottled (red) jasper, lydianite, agate and chert. Hammer-technique and pressure-flaking technique appear to have been utilized alike. The tanged and the almond-shaped points seem to bear typological comparison with African Aterian, Late Still Bay and Wilton types. The burins are essentially of the spalled order, comprising angle as well as transverse types, while there is a single incomplete specimen of the fluted order also. The tools represent series IV of Burkitt and Cammiade.

The cores are short blade-cores, mainly of the fluted as well as the chisel-ended or conical types, besides a few multi-directional lumps also. They have prepared as well as shallow-dished platforms. As the material, quartz, is very intractable, the relative difference in bulk of waste flakes to true tools is enormous. The collection, consisting of about fiftyfive genuine artefacts, would seem to have all the general traits of an Epi-palaeolithic-microlithic industry.

B. DESCRIPTION OF THE TOOL-TYPES

The following tools represent the characteristic types in the collection. Where not specifically mentioned, the material is milky or dyke-quartz.

(i). Parallel-sided blades (fig. 11 ; pl. XXIV)

65. A specimen with both ends truncated, with a low mid-rib on the upper side which has also been partly trimmed flatly. The side-edges show serrations, probably due to use.

66. Part of the platform and bulb has been trimmed away. It has a flattishly worked upper side, and the side-edges show delicate secondary retouch.

(ii). Backed blades (fig. 11 ; pl. XXIV)

The following four tools represent the characteristics of this group.

67. Example of a backed blade with the upper platform and suffused bulb present. The lower oblique end is trimmed and recalls the pen-knife blades of the Mesolithic. The left margin is backed by steep retouch and the right edge shows serrations due to use.

68. Another shorter blade with both upper and lower ends truncated and with a mid-rib to the left of the centre. Backing is not complete and is seen only near upper end, but the right edge shows secondary retouch.
69. Blade on mottled jasperite quartzite, the platform and suffused bulb present, with a straight untrimmed back on the right margin, flatly trimmed right upper surface (with ripples) and left working-edge which exhibits delicate retouch and has a small notch also near the lower end.

(iii). Lunates (fig. 11 ; pl. XXIV)

70. This is one of the two normal blunted arc type, the working-edge of which shows delicate retouch and is much serrated, perhaps due to use.

71. This is another lunate of almost semi-circular shape, with its thick chord blunted and with the arc sharply worked into an edge.

(iv). Scrapers (fig. 11 ; pl. XXIV)

72. This is a nosed end-scraper on a core, recalling its counterparts of the Upper Palaeolithic. The scraper-edge is effected by a few tiny ribbon-spalls removed vertically in the nosed edge.

73. This is a diminutive flake scraper on lydianite and its working-edge, effected on the bulbar platform itself, is characterized by fine and steep retouch.

(v). Borers

These two have flakes removed in such a way as to leave a sharp point useful for boring.

(vi). Almond-shaped points (fig. 11 ; pl. XXIV)

74. This is about the largest of the specimens of this type, being 1½ in. along the longer side. It exhibits fine controlled pressure-flaking over both the sides and has a pointed tip.

75. This is another point just more than ½ in. long, with delicate secondary working and a slightly rounded tip.

(vii). Tanged points (fig. 11 ; pl. XXIV)

76. This is on greenish quartzite and has a fine tang, trimmed shoulders and a leaf-shaped and mid-ribbed upper part.

77. This is another point on quartz and has a broad upper part, fairly pointed tip, double shoulder and short tang.

78. This is a very delicately retouched specimen, much smaller than the other two, having a very pronounced shoulder and converging sharp tip.

79. This is a solitary specimen of a tanged arrow-head with a single shoulder and sharp tip. In the microlithic industries of north Africa and Europe, exquisitely worked single shouldered tanged points are very common.

(viii). Burinate tools (fig. 11 ; pl. XXIV)

80. This is a central (angle) burin type of the 'spalled' order executed on a thick lydianite flake with the characteristic stepped scars of a burin-facet.
Fig. 11. Microliths from Giddalur II: 65 and 66, parallel-sided blades; 67-69, backed blades; 70 and 71, lunates; 72 and 73, scrapers; 74 and 75, almond-shaped points; 76-79, tanged points; 80-82, burinate tools; 83, obliquely blunted point.
81. This is a transverse burin, again of the 'spalled' order on a core of lydianite, the burin-facet being obtained by a fine deep vertical spall meeting a transverse spall on the platform.

82. This is an incomplete specimen of the 'fluted' order roughly analogous to the 'parrot-beak' or 'polyhedral' type. This is formed by a deep concave vertical spall intersected by an array of 'fluted' transverse ribbon-scars. The specimen is made on pinkish fine-grained quartz.

(ix). Obliquely blunted point (fig. 11; pl. XXIV)

83. A diminutive piece on agate with one side backed and the other edge untrimmed and with an oblique crosswise edge ending in a point which has slight serrations along it resembling the obliquely blunted point.

7. ACKNOWLEDGEMENTS

The author wishes to record his deep obligations to Shri Raghbir Singh, Senior Draughtsman and Shri B. S. Bist of the Department of Archaeology, for the line-drawings, to Shri R. Chatterjee, Photographer, Excavations Branch, and Shri M. Naicker, Southern Circle, Madras, for the photographs and to Shri K. Ramaswami, Draughtsman-Surveyor, Prehistory Section, for the preparation of the physiographic map of the Giddalur region. He cannot but mention the very helpful suggestions he received from Shri V. D. Krishnaswami, Superintendent of Archaeology, South-eastern Circle, Visakhapatnam, during the initial stages of study of this collection.