# The Significance of Lithic Finds in the Cave Areas of Kurnool, India

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RECENT discoveries in the Indian subcontinent of flake-blade, blade, and blade-and-burin industries from open-air stations and stratified river deposits have added further knowledge to the lithic phase that intervenes between the Indian Middle (Middle Palaeolithic) and Late (Mesolithic) Stone Ages. Some of the tool types of these industries have random morphological similarities to the Upper Palaeolithic forms. Unfortunately, the other important attribute of the Upper Palaeolithic, the bone technology, is as yet not accounted for at the open-air stations; and the possibility for the preservation of bone artifacts, if any, exists in the caves. Such caves are known in the Kurnool district of Andhra Pradesh State. Captain Newbold (1844: 610–611) was the first to discover that the Billa Surgam caves (Fig. 1) near Betamcherla are ossiferous. About half a century later his work was followed up by R. B. Foote (1884*a*) and his son H. B. Foote, and by L. A. Cammiade (1927), as a result of which groups of caves (other than Billa Surgam) known as (1) Gollagutta, Krishnamma Kona Gavi, Sanyasula Gavi, and several other smaller caves, around Betamcherla; and (2) Yaganti, Yerrazarigabbi, Billam, etc., in the vicinity of Banaganapalli, became known to the archaeologists. Further, the excavations of R. B. Foote (1884*b*; 1885) and H. B. Foote in the Billa Surgam caves yielded bone implements along with Late Pleistocene fauna (Foote 1885; Lydekkar 1886). Some of the bone implements, according to R. B. Foote, are comparable to the Magdalenian of France. But paradoxically, the complementary lithic evidence was reported to be absent in the finds obtained by excavation at Billa Surgam, which not only makes it difficult to place these bone artifacts in their proper framework but also blocks the reconstruction of the extra-lithic attributes at the open-air stations.

Fresh explorations carried out by the authors have disclosed (1) blade artifacts in the exposed cave deposit of Billa Surgam; and (2) surface distribution of stone

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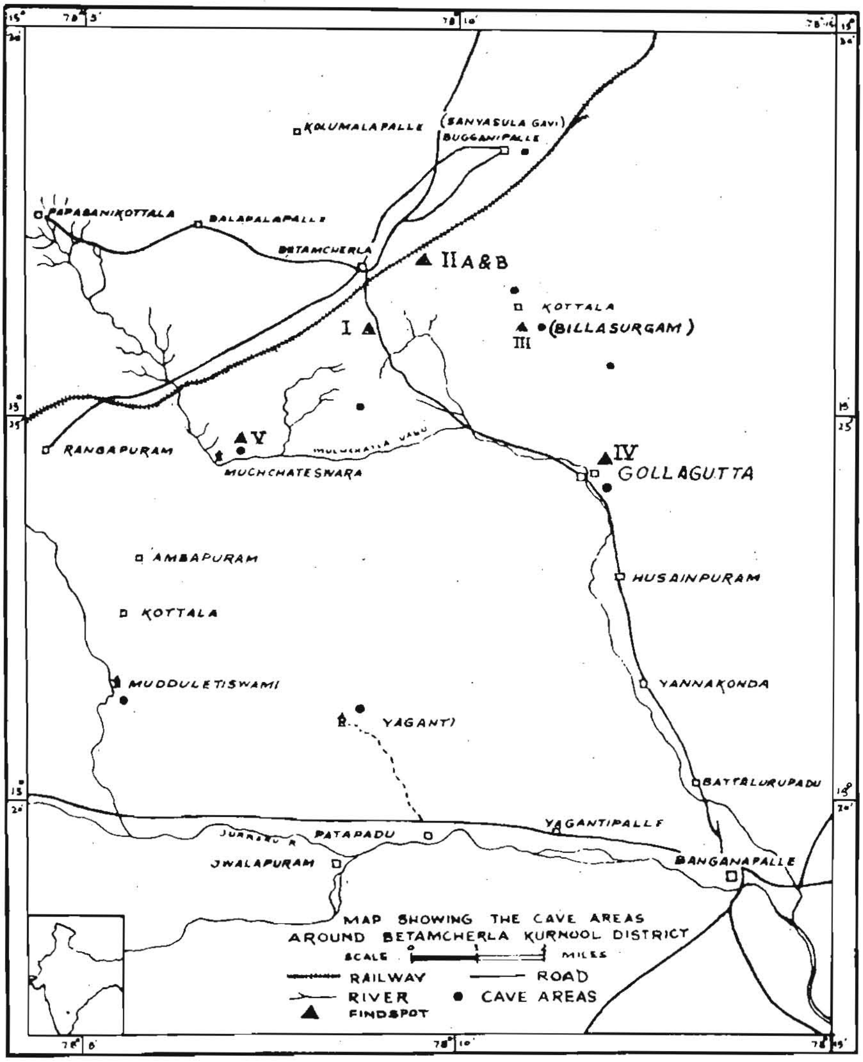


Fig. 1

tool assemblages displaying (a) a flake-and-nodule tool and blade tradition and (b) a microlithic tradition. On the basis of these new discoveries, the bone implements reported by Foote can be ascribed on more reliable grounds to a phase recalling the Upper Palaeolithic. They also help us to postulate the likelihood of bone technology at the open-air stations (at least) in this geographical area yielding blade-and-burin industries. The absence of osteo-artifactual remains at the open-air stations might be due to climatic conditions that are deleterious for their preservation.

## THE FINDSPOTS

The explored area is situated in the vicinity of Betamcherla (Kurnool District, Andhra Pradesh), a small town on the Hubli-Guntur meter gauge route of the

South Central Railway. The region is a semi-arid country characterized by low hills and plateaus cut across by short canyons. A number of small feeders run down the hilly slopes, flow as a few streamlets, and open into the river Jurreru near the village Banaganapalli, southeast of Betamcherla. The geological formations comprise Archean, Dharwar, and Purana groups. The caves under study are situated in the limestone formations of the latter group. While the plateaus at places are characterized by short to tall grass cover and occasional xerophytes, the hilly slopes, the talus slopes on the sides of the limestone escarpments, and the streamlets support scrub-and-tree jungle due to the subterranean streams, which occasionally emerge as hillside springs. The vegetation cover, however, thins during the hot-weather months (March-July), when the landscape looks parched and brown.

In the cave areas small game animals abound, of which the most important are *Hystrix indica, Vivericula indica, Felis chaus, Lepus nigricollis,* and *Hyaena hyaena.* Some of the communities of Betamcherla (particularly the *yerukulas* and *boyas*) regularly hunt *Lepus nigricollis* and *Hystrix indica* by laying traps and nets in the primitive way. When the other animals (except hyenas) are encountered, they are also preyed upon.

## The Lithic Assemblages

The lithic assemblages were recovered from five findspots: (a) a field 2 km southeast of Betamcherla (Findspot I); (b) from the hilltop (Findspot IIA) and slopes (Findspot IIB) 1 km northeast of Betamcherla; (c) the exposed calcified cave deposit of Billa Surgam (Findspot III); (d) foothills at Gollagutta (Findspot IV); and (e) near Muchchatla temple 5 km southeast of Betamcherla (Findspot V). (See Fig. 1.)

The collection comprises 298 finds, of which, on technological grounds, 150 represent the assemblage with the flake-and-nodule tool and blade tradition and the remaining 148 form the assemblage with the microlithic tradition. Both assemblages have distinguishing features. The raw material for the flake-and-nodule tool and blade assemblage is to a great extent limestone, and to some extent quartzite and chert, while chert is the chief raw material for the microlithic assemblage. In the former assemblage heavy tools on nodules with bold flaking are common. The latter is characterized by small flakes and blades, and the retouch on the worked specimens is delicate.

### *Flake-and-Nodule Tool and Blade Assemblage*

The artifact types belonging to different findspots (Table 1) have common typo-technological features. On the whole the assemblage has a crude appearance. Scrapers are characterized by convex (3 specimens), straight (7 specimens), and concave (1 specimen) cutting edges. Chisels on nodules have the working edge on the transverse axis, which is produced by the intersection of two steep sides (either one or both worked) and with partially or fully chipped butt ends. The perforator is finished by delicate retouch at the terminal end. Burins have well-defined business ends. Flakes have irregular negative scars on the upper surfaces, suggesting that the preparation of the core for flake detachment was not regularized. Blades are parallel-sided (20 specimens: 4, 4, 10, and 2 from findspots I-IV, respectively),

TABLE 1. FLAKE-AND-NODULE TOOL AND BLADE ASSEMBLAGE

| ARTIFACT TYPES | FINDSPOT I | FINDSPOT IIA | FINDSPOT III | FINDSPOT IV | FINDSPOT V | RAW MATERIAL* | TOTAL |
|---|---|---|---|---|---|---|---|
| Scrapers (Fig. 2, nos. 1–5) | 5 | 2 | 4 | — | — | Ch: 3; Qt: 2; Ls: 6 | 11 (7.33%) |
| Chisels on nodule (Fig. 2, nos. 6–7) | 5 | — | — | — | — | Ls: 5 | 5 (3.33%) |
| Perforators (Fig. 2, no. 8) | 1 | — | — | — | — | Ls: 1 | 1 (0.70%) |
| Burins (Fig. 2, nos. 9–10) | 2 | 1 | — | — | — | Ch: 1; Ls: 2 | 3 (2.00%) |
| Flakes (Fig. 2, nos. 11–13) | 24 | 2 | 8 | — | 9 | Ch: 11; Qt: 1; Ls: 31 | 43 (28.66%) |
| Blades (Fig. 3, nos. 14–21) | 12 | 13 | 20 | 2 | 5 | Ch: 2; Qt: 9; Ls: 41 | 52 (34.66%) |
| Nodules (Fig. 3, no. 22) | 8 | — | 8 | — | — | Ls: 16 | 16 (10.66%) |
| Cores (Fig. 3, nos. 23–25) | 3 | 4 | 4 | — | 3 | Ch: 2; Qt: 2; Ls: 9; Ss: 1 | 14 (9.33%) |
| Chips | — | — | 5 | — | — | Ls: 5 | 5 (3.33%) |
| Total | 60 | 22 | 49 | 2 | 17 | | 150 |

* Ch: chert; Qt: quartzite; Ls: limestone; Ss: sandstone.

pointed (14 specimens: 8 and 6 from findspots II and III, respectively) and irregular (18 specimens: from findspots II-IV, respectively). Nodules are dressed with a cylinder hammer; those with ill-defined flaking and indeterminate shapes do not indicate any functional significance. (The single illustrated specimen could serve the function of a spoke shave.) Cores are cylindrical (8 specimens: 3, 1, 2 and 2 from findspots I, IIA, III, and V, respectively) and irregular (6 specimens: 3, 2, and 1 from findspots IIA, III and V, respectively). Chips included in the collection belong to the cave sediment of Billa Surgam (Findspot III), and they are miniature, irregular splinters characterized by thin negative scars on the dorsal surface. Among the raw materials limestone accounts for 77.33%, chert for 12.66%, quartzite for 9.35%, and sandstone for 0.66%.

### *Microlithic Assemblage*

The artifact types from different findspots (Table 2) are typical of the non-geometric facies of the Indian Late Stone Age (Mesolithic). The appearance of the flakes, which are thin, small, and with strip flaking on their upper surfaces, suggests their detachment by the light hammer. The predominance of fluted cores of the finest quality reveals that the fluted core technique of blade production is well developed. Whereas the occurrence of fluted cores is common, the availability of blades is low. No finished forms other than scrapers are available. Barring one specimen that is on a blade, all the scrapers are on flakes. These are straight (9 specimens), convex (6 specimens), concave (1 specimen) and end (1 specimen) scrapers. All the flakes are characterized by thin striplike negative flake scars on their dorsal surfaces. Blades are irregular (4 specimens) and parallel sided (3 specimens). Cores are of the fluted (32 specimens: 12, 13, and 7 from findspots

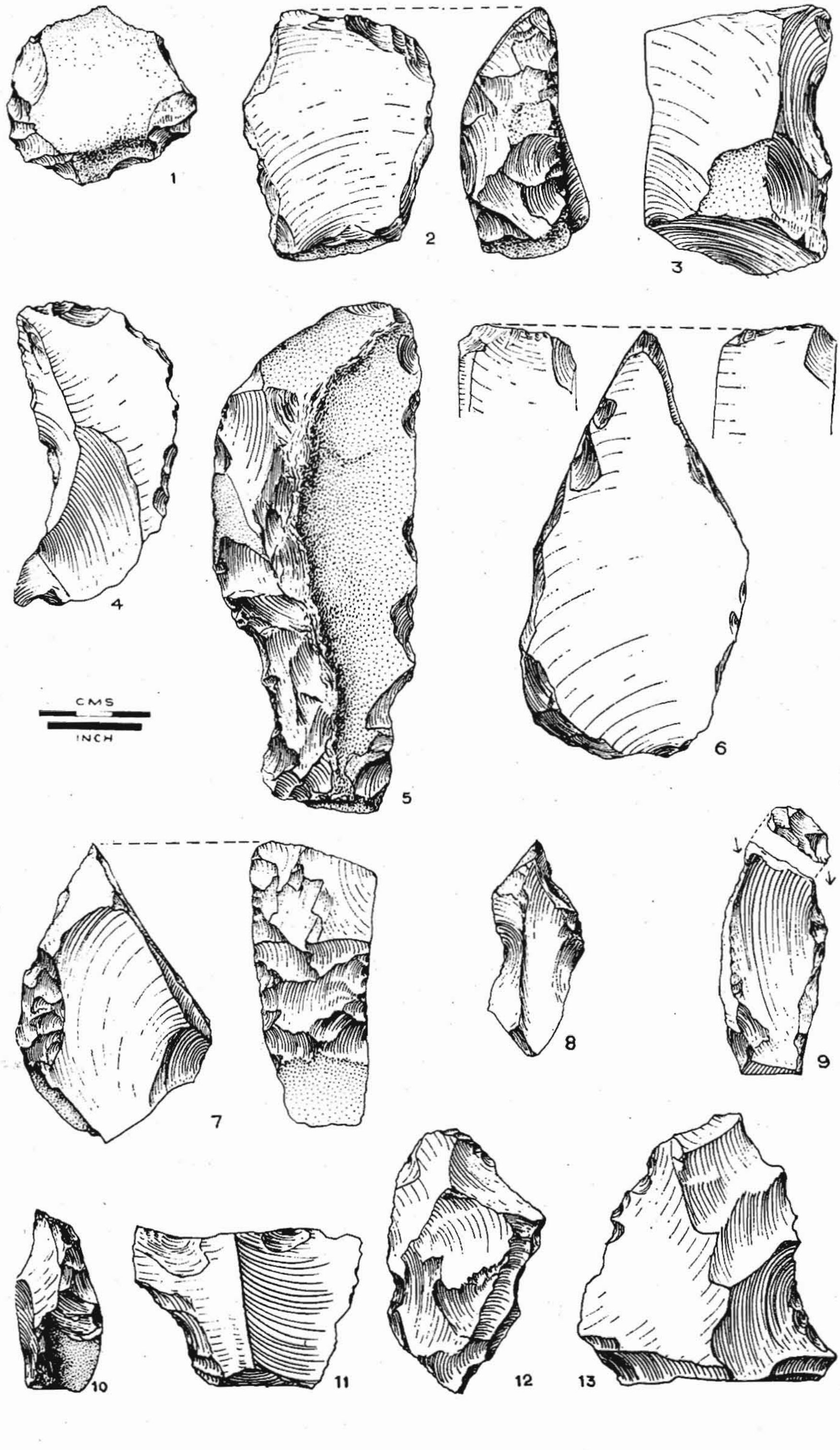
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TABLE 2. MICROLITHIC ASSEMBLAGE

| ARTIFACT TYPES | FINDSPOT IIA | FINDSPOT IIB | FINDSPOT IV | RAW MATERIAL* | TOTAL |
|---|---|---|---|---|---|
| Scrapers (Fig. 4, nos. 26–28) | 7 | 7 | 3 | Cl: 8; Ch: 2; Ag: 1; Js: 4; Ls: 2 | 17 (11.50%) |
| Flakes (Fig. 4, nos. 29–30) | 12 | 20 | 7 | Cl: 8; Ch: 10; Ag: 2; Js: 17; Ls: 2 | 39 (26.35%) |
| Blades (Fig. 4, nos. 31–34) | — | 3 | 4 | Cl: 1; Ch: 4; Qt: 1; Ls: 1 | 7 (4.73%) |
| Cores (Fig. 4, nos. 35–36) | 22 | 13 | 7 | Cl: 9; Ch: 15; Ag: 1; Js: 12; Qt: 2; Ls: 2; Qz: 1 | 42 (28.37%) |
| Chips | 25 | 18 | — | Cl: 10; Ch: 15; Js: 18 | 43 (29.05%) |
| Total | 66 | 61 | 21 | | 148 |

* Cl: chalcedony; Ch: chert; Js: jasper; Ag: agate; Ls: limestone; Qt: quartzite; Qz: quartz.

IIA, IIB, and IV, respectively) and irregular (10 specimens from findspot IIA) varieties. Chips are thin irregular splinters indicative of core dressing. The raw materials for the microlithic assemblage are jasper (34.50%), chert (31.0%), chalcedony (24.30%), limestone (4.80%), agate (2.70%), quartzite (2.00%), and milky quartz (0.70%).

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Fig. 2 Flake-and-nodule tool and blade assemblage.

*1* Convex scraper on chocolate brown chert flake with cortex on the thick side and retouch on the functional side; 45 × 51 × 17 mm; triangular cross-section. (Findspot I.)

*2* Side scraper on creamy-gray limestone nodule with retouch on the functional side and dorso-ventrally flat parallel surfaces; 73 × 50 × 29 mm; rectangular cross-section. (Findspot I.)

*3* Side scraper on cream colored fine-grained quartzite with straight functional edge; 44 × 24 × 9 mm; parallelogrammatic cross-section. (Findspot I.)

*4* Convex scraper on green limestone flake; 82 × 37 × 20 mm; triangular cross-section. (Findspot III.)

*5* Side scraper on an elongated flake having a thick worked steep side opposed to a straight functional side and one end retouched; 140 × 55 × 36 mm; triangular cross-section. (Findspot III.)

*6* Chisel on a creamy-gray limestone nodule with flat surfaces; business end produced by the intersection of two lateral steep sides (one being concave); chipped butt-end; 118 × 59 × 32 mm; rectangular cross-section. (Findspot I.)

*7* Chisel on creamy-gray limestone nodule with one chipped lateral side intersecting with the other flat and steep side producing the business end; 77 × 54 × 35 mm; sectorlike cross-section. (Findspot I.)

*8* Perforator on a creamy-gray limestone nodule; 58 × 24 × 14 mm; plano-convex cross-section. (Findspot I.)

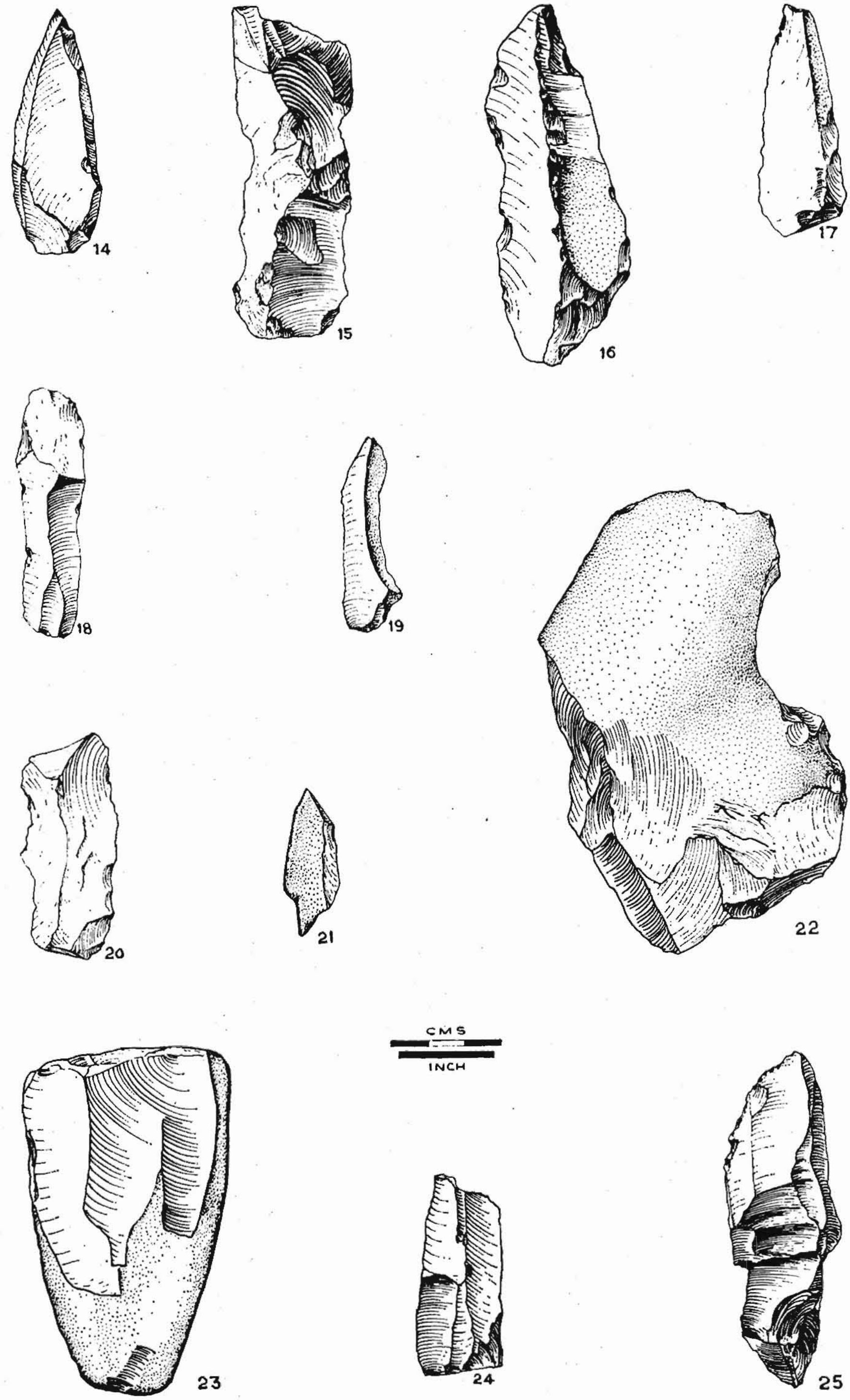
*9* Burin on a parallel sided and thick creamy-gray limestone nodule; burin edge produced by vertical spalls opposed to the (slightly) oblique retouched facet on the horizontal axis; 64 × 29 × 15 mm; rectangular cross-section. (Findspot I.)

*10* Burin on a creamy-gray limestone nodule with vertical spalls on one surface intersecting with the other surface producing the burin edge; 48 × 19 × 23 mm; triangular cross-section. (Findspot I.)

*11* Flake on green limestone with broad negative scars and a ridge on the dorsal surface; 42 × 62 × 20 mm; triangular cross-section. (Findspot I.)

*12* Flake on green limestone with irregularly flaked dorsal surface; 72 × 42 × 20 mm; concavo-convex cross-section. (Findspot III.)

*13* Flake on olive green limestone with irregularly flaked dorsal surface; 72 × 71 × 14 mm; triangular cross-section. (Findspot III.)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## DISCUSSION AND CONCLUSIONS

The meager availability of artifacts at these findspots suggests that they are only transit sites. In point of fact, most of the sites scattered in the hilly and forested areas of the Nallamalai and Erramalai ranges (in this geographical area) might belong to the same category. The earlier discoveries of Isaac (1960: 176–304) resulted in the location of twenty-six sites in the Nallamalai area and eight sites in the Erramalai area yielding Series III industries (Upper Palaeolithic), and ten sites in the Nallamalai and eight sites in the Erramalai areas yielding microlithic industries (Late Stone Age or Mesolithic). Even so, the total number of artifacts is surprisingly low: 782 specimens of Series III (from thirty-four sites) and 736 specimens of microlithic (from eighteen sites) orders. Also, the microlithic collection of Rami Reddy (1968: 70–98) from eight sites in the western part of Kurnool district and six sites in the adjoining Anantapur district comprises a total of 1112 artifacts. As against this, extensive chipping floors are known farther north at Yerragondapalem in the Kurnool district and northeast at Renigunta in the Chittoor district, both places lying in the open country broken by hills and offshoots of the Eastern Hill ranges. These chipping floors are littered with finished forms, flake-and-blade blanks, cores, and chips running into several thousands. For instance, the collection made from restricted areas at Renigunta (Murty 1970: 106–128) comprises 5993 specimens of the blade-and-burin industry and 1834 specimens of the microlithic industry.

The artifacts and tool types of the flake-and-nodule tool and blade assemblage under discussion, made on different raw materials and occurring in different findspots, are in the same state of preservation, indicating that the total ensemble belongs to a single chronological period. This assemblage is technologically intermediate between the Middle and Late Stone Ages. It includes a few well-defined burins, which is technologically significant, and the blade element is comparable to the types of Renigunta and Yerragondapalem industries. Medium-heavy tools such as scrapers on flakes and nodules also form a component of the Renigunta and

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Fig. 3 Flake-and-nodule tool and blade assemblage.

*14* Blade on olive green limestone with slight working on the ventral surface; 65 × 24 × 11 mm; rectangular cross-section. (Findspot I.)

*15* Blade on olive green limestone with crisscross flaking and wavy mid-ridge on the dorsal surface; 96 × 32 × 24 mm; triangular cross-section. (Findspot I.)

*16* Blade on olive green limestone; 95 × 36 × 21 mm; triangular cross-section. (Findspot I.)

*17* Blade on olive green limestone with a steep side opposed to a sharp side; 61 × 23 × 13 mm; sectorlike cross-section. (Findspot I.)

*18* Blade on sky-blue limestone; 64 × 17 × 10 mm; triangular cross-section. (Findspot III.)

*19* Blade on sky-blue limestone; 53 × 11 × 4 mm; triangular cross-section. (Findspot III.)

*20* Blade on olive green limestone; 58 × 25 × 10 mm; triangular cross-section. (Findspot III.)

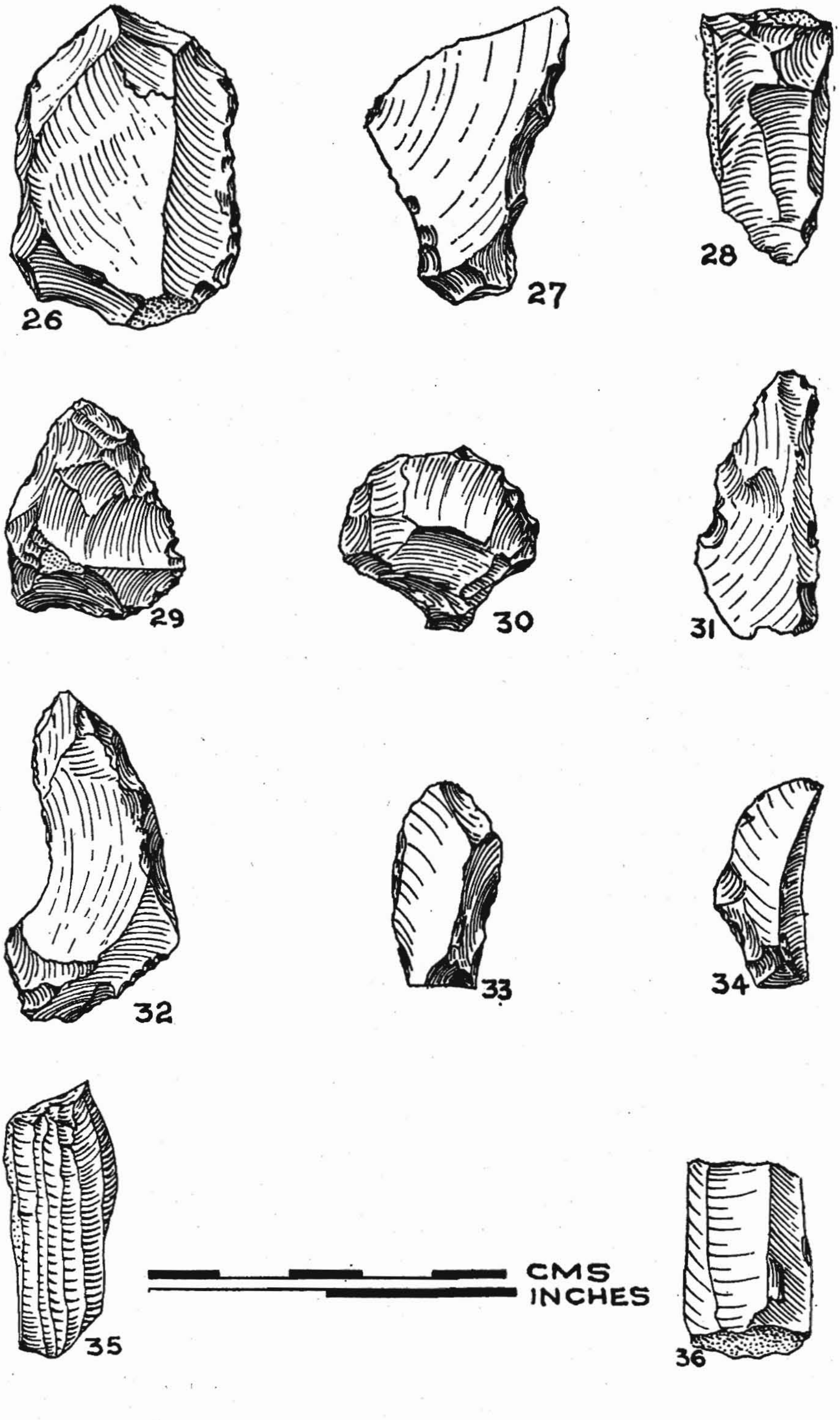
*21* Blade on olive green limestone; 46 × 14 × 10 mm; triangular cross-section. (Findspot III.)

*22* Worked nodule on creamy-gray limestone nodule with partial flaking and a notch on one side; 123 × 72 × 49 mm; sectorlike cross-section. (Findspot I.)

*23* Blade-core on olive green limestone with parallel negative scars along partial perimeter; 94 × 57 × 36 mm; biconvex cross-section. (Findspot I.)

*24* Cylindrical core on green limestone; 53 × 22 × 18 mm; polygonal cross-section. (Findspot V.)

*25* Irregular core on chocolate-brown chert; 92 × 31 × 26 mm; polygonal cross-section. (Findspot V.)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Yerragondapalem industries, as is the case here, but the workmanship in the former is superior to the types of this assemblage. In view of its technical inferiority in comparison with the Renigunta and Yerragondapalem industries, the flake-and-nodule tool and blade assemblage can be regarded as an incipient facies of the phase heralding the inception of blade-tool technology.

Another rather significant aspect that should be emphasized is the occurrence of regular blades in the consolidated cave sediment at Billa Surgam (Findspot III). As mentioned earlier, Foote reported the absence of lithic artifacts in these caves, while he recovered several bone implements along with Late Pleistocene fauna. The bone implements recognized by Foote are (a) awls, (b) barbed and unbarbed arrowheads, (c) spear or harpoon heads, (d) daggers, (e) scraper knives, (f) chisels, (g) gouge, (h) wedges, (i) axeheads, and (j) sockets. Typical blades now extracted from the cave sediment at Billa Surgam provide the complementary evidence, proving beyond doubt that these cave areas were inhabited in Late Pleistocene times by communities with a blade-and-bone technology.

At this juncture, a brief review of other evidence would be useful in understanding the contextual occurrence of these lithic assemblages in this geographical area in general and in the Indian subcontinent in particular.

The taxonomical nomenclature of the pre-Neolithic industries of the Pleistocene and early Holocene (following the decision made at the International Conference on Asian Archaeology held at New Delhi in 1961) recognizes three industries known as Early Stone Age (Middle Pleistocene to early Upper Pleistocene), Middle Stone Age (Upper Pleistocene), and Late Stone Age (early Holocene). These three industries, in terms of European nomenclature, are synonymous with the Lower Palaeolithic, Middle Palaeolithic, and Mesolithic, respectively. No provision has previously been made for the Upper Palaeolithic, owing to the paucity of evidence. As was noted earlier, investigations conducted in recent years have brought to light flake-blade, blade-tool, and blade-and-burin industries from different parts of the country. Such a distribution implies regional elaboration of lithic-blade technology in post-Middle Stone Age times.

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Fig. 4 Microlithic assemblage.

*26* Straight-sided scraper on black chert with delicate unifacial retouch; 43 × 31 × 11 mm; plano-convex cross-section. (Findspot IV.)

*27* Concave scraper on green limestone; 36 × 24 × 8 mm; triangular cross-section. (Findspot IV.)

*28* End scraper on steep sided blade of black chert with unifacial retouch; 34 × 18 × 9 mm; rectangular cross-section. (Findspot IV.)

*29* Triangular flake on red jasper; 31 × 22 × 10 mm; triangular cross-section. (Findspot IV.)

*30* Worked flake on brown chert having a convex retouched end; 26 × 28 × 9 mm; plano-convex cross-section. (Findspot IV.)

*31* Blade on white fine-grained quartzite; 37 × 16 × 7 mm; triangular cross-section. (Findspot IV.)

*32* Blade on brown chert; 44 × 16 × 11 mm; triangular cross-section. (Findspot IV.)

*33* Blade on green limestone with partial retouch on the ventral surface; 28 × 14 × 7 mm;. triangular cross-section. (Findspot IV.)

*34* Blade on green chalcedony; 28 × 12 × 8 mm; triangular cross-section. (Findspot IV.)

*35* Fluted core on red jasper with a chisel edge; 37 × 16 × 17 mm; polygonal cross-section. (Findspot IV.)

*36* Fluted core on green chalcedony with a flat base; 26 × 19 × 15 mm; polygonal cross-section. (Findspot IV.)

Industries having a predominant flake-blade element are known from (1) Dhekulia, Palmau district, Bihar, occurring in a stratigraphical layer succeeding the Middle Stone Age (Ghosh et al. 1965–66: 163); (2) Janekpur and Jhansighat, near Hoshangabad on the Narmada river in Madhya Pradesh (De Terra and Paterson 1939: 320); and (3) Maheswar, also in Madhya Pradesh (Sankalia et al. 1958: 37–41). In these industries, blades occur in varying proportions, finished forms on blades and burins are rare, and scrapers and point tool types have the greatest representation.

In the group constituting the blade-tool industries, typical blades, finished blade-tools, and a few burins form an important component along with scraper-point types on flake and flake-blade. Such industries are reported from (1) Bariyari, Banda district (Sharma 1955–56: 4) and on the river Belan in Allahabad district (Sharma 1967), both in Uttar Pradesh; (2) Singhbhum in Bihar (Ghosh 1965: 49); (3) a few sites on the river Banjer in Madhya Pradesh; (4) Nevasa (Sankalia 1960: 5) and Dhevalpuri in Maharashtra; (5) Budh Pushkar near Ajmer, central Rajasthan (Allchin et al. 1972: 541–564); (6) Shorapur Doab in Mysore State (Paddayya 1970: 165–190); (7) a cave site at Bhim Betka in the Raisen district of Madhya Pradesh (V. N. Misra, personal communication); and (8) a cave site in the Kurnool area. In addition to typical lithic blades, the Kurnool cave site has yielded a variety of bone tools: (1) scrapers; (2) perforators; (3) chisels; (4) scoops; (5) shouldered points; (6) barbs; and (7) spatulas, in association with Late Pleistocene fauna (M. L. K. Murty 1974). The flake-and-nodule tool and blade assemblage under discussion also falls into this group.

Then there is the group from Renigunta and Yerragondapalem, mentioned earlier, in which blade, backed-blade, and burin elements displaying typical Upper Palaeolithic traits are predominant. To this may be added the recently discovered industry at Patne in Jalagaon district, Maharashtra (S. A. Sali, personal communication). Excavation of this site revealed a succession beginning with Middle Palaeolithic, followed by Upper Palaeolithic, and ending with Mesolithic. On the basis of stratigraphy, four phases have been distinguished in the Upper Palaeolithic ensemble (phases A to D). Phase A has thick blades, end scrapers on blade, backed knives, and burins. In Phase B there is a general increase in the blade element, and the tool types constitute backed blade variants, retouched blades, burins, and awls on blades. Jasper is the chief raw material in phases A and B. There is a diminution in the size of artifacts from Phase C. The special feature of this phase is the occurrence of a wide range of burin types and backed blade-tools; the outstanding features are the occurrence of a disc bead on a fragment of ostrich eggshell, and an engraving in a crisscross pattern also on a fragment of ostrich eggshell, both types known for the first time in India. Phase D marks the end of the Upper Palaeolithic and the beginning of microlithic.

There is, finally, another group of Upper Palaeolithic-like industries displaying a tendency toward microlithization. Such industries are known from (1) in and around the painted rock shelters at Basauli and Lekhania, both in the Mirzapur district of Uttar Pradesh (Sharma 1956–57: 11, 14–15, and Pl. VIII); (2) in the vicinity of several rock shelters at Mori, Mandosar district, Madhya Pradesh (Dikshit 1957–58: 26–27); (3) Nagarjunakonda, Guntur district, Andhra Pradesh (Soundara Rajan 1958: 49–113); and (4) sand dunes at Visadi, Gujarat (Allchin and Gowdie 1971: 248–65).

The foregoing evidence related to the dispersal of flake-and-nodule tool and blade assemblages in the Kurnool cave area and the cooccurrence of blade-and-bone artifacts in the cave sediments; and industries variously referred to as Series III/flake-blade/blade-tool/blade-and-burin/Upper Palaeolithic or Upper Palaeolithic-like, having distribution in different parts of the country, warrants a taxonomical position for this phase in the Indian sequence. Since these industries are (wherever the evidence is available) typologically/stratigraphically intermediate between the Indian equivalents to the Middle Palaeolithic and Mesolithic of Europe, and they bear resemblances to the Upper Palaeolithic of the same region, the Indian industries could also be ascribed to the Upper Palaeolithic; notwithstanding the fact that there are not as many Upper Palaeolithic subdivisions in the Indian subcontinent as in Europe. We are still a long way from understanding the extratechnological and suprasomatic preoccupations of the authors of these industries, as is true in other parts of the Old World. It is hoped that the investigations being conducted in the Kurnool caves and in the painted caves and rock shelters in central India will unravel this problem.

The microlithic assemblage from the cave areas under discussion is homogeneous with the nongeometric facies of the Indian Late Stone Age and requires no special comment.

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