SUMMARY AND CONCLUSIONS

Cuddapah belongs geologically to Cuddapah System which is mainly a succession of quartzitic sandstones or quartzites and shales or slates. A detailed investigation into the prehistoric archaeology of the district has brought to light a succession of three stone age cultures termed as the Early Stone Age, Middle Stone Age and the Late Stone Age. These cultures are associated with three successive gravel beds each overlain by a sand or silt.

The stratigraphical sequence on the Sagileru is as follows:

1. Weathered rock (Sudde);
2. Basal gravel (I); E.S.A.;
3. White calcareous coarse sand;
4. Middle gravel (II); M.S.A.;
5. White calcareous coarse sand;
6. Upper gravel (III); L.S.A.;
7. Black silty sand.

On the basis of correlation of archaeological evidence with the Narmada and Godavari industries which are associated with the Middle Pliocene fauna, the gravel I yielding the Early Stone Age industry with overlying sand is assigned to the Middle Pliocene; gravel II, yielding the Middle Stone Age artifacts, with a overlying coarse sand, to the late Middle Pliocene - Upper Pliocene and gravel III which is associated with the Late Stone Age industry and a top silty sand to early part of Holocene.

The Early Stone Age

These tools come from the basal gravel, modern river bed, surface or terrace and foothills. The concentration of this cultures appears to be more in the Sagileru basin than the rest of the region which is attested by a number of sites discovered and occurrence of abundant
number of stone artifacts throughout the valley.

The artifacts are made on, mostly, quartzitic pebbles; quartzitic sandstone is occasionally used.

The methods employed in the manufacture of the tools are block-on-block, stone hammer and cylinder hammer techniques.

The tool types are i) pebble tools comprising flat based tools, unifacial and bifacial oblates and points; ii) bifaces of various shapes such as sub-oval, oval, elliptical, rectangular, triangular, pear shaped, cordiform, fieron and sub-rectangular etc; iii) unifaces of different shapes as in the case of bifaces; iv) cleavers; v) discoids; vi) retouched flakes. Majority of the tools are made on water worn pebbles.

The ratio of pebble tools to handaxes is 30.6% in general and 41.3% at Mandipalle and 44% at Vaddanamu both being type sites in the Sagileru basin. Thus the occurrence of pebble tools in the Sagileru basin is more than from the rest of the region. But at Tabballapalle (Kammeru) which falls in the Sagileru basin, the occurrence of pebble tools and bifaces is less. Instead flake tools (flake choppers) are in majority and the ratio between flake tools and bifaces is 4:1.

The pebble tools, in general, are typical Sohanian and are similar to those found at Kurnool, Chittoor, Nellore, Rajasthan and in the Narmada Valley, Beas and Banganga Valley, and Singhrauli basin. The flake tools from Tabballapalle bear striking similarities with the flake choppers of the Narmada which are similar to pre-Sohan implements.

The pebble tools from outside India, in general, and from Anythian of Burma, Chou-Koutienian of China, Tempanian of Java and from Olduvai Bed I of Africa in particular, find similarities in their counterparts from Cuddapah.
The bifaces and unifaces are also made on mostly water worn pebbles and occasionally on nodules and chunks wherever the pebbles are not accessible such as at Kamagiri. Several forms of bifaces are present of which the noteworthy shape is sub-rectangular type (bottle shaped) which are not reported from any site in India, so far. The purpose to which they were put is not known. Many of the bifaces and unifaces are pointed or nearly pointed which is also testified by the metrical analysis. The tools from outside the Sagarla basin are more refined and advanced in technique. All the cleavers are made on flakes. A few of them retain cortex on the dorsal.

Flake tools made on massive or big size to small size flakes are worked either along the sides or ends or around the periphery and may have served for chopping and scraping purposes. The average length, breadth and thickness of these flake tools are 9.7 cm, 7.2 cm and 3.2 cm respectively.

The bifacial industries obtained from the basal gravel in the trial excavations at Nandipalle and Vadamalay are not different from those of other sites except in workmanship. They are crude.

Thus the biface group of tools have crude and neatly finished types and closely compare, typo-technologically, with the Peninsular biface complex and the Abbevillian-Acheulian facies of Africa and Europe.

The important evidence that has emerged from the above study is that the Early Stone Age industry from Cuddapah is a biface tradition and the availability of raw material in shape of pebbles or pebble boulders has a considerable role in producing the number of pebble tools than anything else such as group migrations.
Fig. 4
FREQUENCY OF DISTRIBUTION

Thickness

Breadth

Length

E.S.A.
M.S.A.
VEMULA
L.S.A.
The Middle Stone Age

The industry comes from the gravel II horizon of Cuddepaah, and surface. This succeeds, directly, the E.S.A. as evinced by stratigraphy and some of the tool types such as miniature bifaces, discoids, and edged tools etc.

The raw material is fine grained to medium grained quartzite of different shades like pale brown, pinkish, rose etc. But the industry from Vemula which falls in between the Middle and Late Stone Age industries (Fig-4) is made of chert and chalcedony.

The artifacts are made on cores and flakes. The methods employed in their manufacture are mainly cylinder hammer or pointed hammer, prepared core and rarely punch techniques. The prepared core flakes with or without facet form 21% of the total flake tools and flakes.

The artifacts include A) Core tools; B) Flake tools; C) Cores and D) Flakes.

A) Core tools comprise miniature bifaces, discoids, pebble tools, edged tools, points and borers.

B) Flake tools consist of tools made on simple, irregular flakes, blade flakes and blades. The tool types are edged tools comprising lateral, terminal, hollow, rounded and chisel edged (burin) tools and points simple and tanged, and borers.

C) Cores are of flake cores, blade cores, prismatic cores etc.

D) Flakes are not tool types but include those slightly retouched, used and unused types.

The tools in general and flake tools in particular are smaller in dimensions than the retouched flake tools of the Early Stone Age.
and larger than those of Late Stone Age. The average length, breadth and thickness of retouched flakes are 5.3 cm, 3.7 cm and 1.6 cm respectively while those of Vemula industry are 3.73 cm, 2.38 cm and .99 cm.

This industry from Cuddapah, is a flake culture and displays a general agreement with the Middle Stone Age pattern of the Indian sub-continent. Regional variations in the raw material, size of the flake tools and prominent retouch are noticed.

Quartzite is used as raw material in Cuddapah unlike the Godavari and the Narmada industries.

The industry has no parallels, outside India, in stricto-senso but to some extent can be compared to Karanganian of Malawi, Sidisian of Tunisia and with the Mousterian of Europe.

The Late Stone Age

This industry comes from the gravel III horizon of Cuddapah in a direct succession of the Middle Stone Age culture. The artifacts are also collected from surface.

The raw material is chiefly quartz while occasional use of chert, quartzite and crystal is noticed.

The methods employed in their manufacture are pointed hammer and punch techniques. Retouch is not prominent and irregular.

The artifacts include tools such as parallel sided flakes, blunted back P.S.F., edged tools of various types including chisel edged, points simple and tanged and borers, and waste products comprising cores which consist of prismatic cores with multifacets, flake cores, irregular cores etc., flakes and chips.

The average length, breadth and thickness of the retouched flakes including parallel sided flakes are 2.44 cm, 1.53 cm, and .66 cm respectively.
The industry is crude by nature and non-geometric. It can be well compared with the other industries, in the country, such as South Western Andhra Pradesh, Nalgonda, Rajasthan, Birbhanpur etc.

Thus the Stone Age cultures beginning with the Early Stone Age and ending with the Late Stone Age are found continuously in a stratified context, for the first time in the Peninsular India. No faunal evidence was found along with the above cultures. An extensive digging into the gravel beds of Sagileru and Bokkinuru may bring forth any such evidence. For the present the Stone Age cultures of Cuddapeh are dated with the Narmada and Godavari cultures which are associated with the Middle Pleistocene fauna. The Early and Middle Stone Ages are dated to the Middle Pleistocene and Late Middle Pleistocene - Upper Pleistocene periods respectively.

There is a diminuendo of sizes of the flake tools from the Early Stone Age to Middle Stone Age and Middle Stone Age to Late Stone Age which is also attested by the statistical comparisons. It is clear from Fig. 4, that the maximum number of retouched flakes fell in their length, breadth and thickness as given below—

<table>
<thead>
<tr>
<th></th>
<th>Length</th>
<th>Breadth</th>
<th>Thickness</th>
</tr>
</thead>
<tbody>
<tr>
<td>E.S.A.</td>
<td>8 cm to 10 cm</td>
<td>5 cm to 7 cm</td>
<td>2 cm to 3 cm</td>
</tr>
<tr>
<td>M.S.A.</td>
<td>4 cm to 6 cm</td>
<td>3 cm to 4 cm</td>
<td>1 cm to 2 cm</td>
</tr>
<tr>
<td>Vemula</td>
<td>3 cm to 4 cm</td>
<td>2 cm to 3 cm</td>
<td>1 cm to 1 cm</td>
</tr>
<tr>
<td>L.S.A.</td>
<td>2 cm to 3 cm</td>
<td>1 cm to 2 cm</td>
<td>1 cm to 1 cm</td>
</tr>
</tbody>
</table>

The above statistical comparisons justify a special treatment to Vemula industry which differs from the rest of the Middle Stone Age industries in the area.
Another important point that emerged from the present study is that the raw material has played a considerable part in the development of various Stone Age cultures which form part and parcel of the Indian Stone Age cultures.