PART III  COMPARATIVE STUDY

CHAPTER VI  COMPARISONS IN INDIA
COMPARISON WITH IN INDIA

The whole of the Indian sub-continent is better known today in the prehistoric archaeology than about 40 years back. After the pioneer work of Robert Bruce Foote, who is rightly called "father of the Indian Prehistory" in South, the Deccan and Central India, many scholars followed the path and several hundreds of Stone Age sites, from most of the States in India, have been brought to light. These researches have proved that India, as a whole, forms one culture area having the similar Stone Age culture complex with some regional variations, mostly depending on the local geology and geographical features.

The scope of the present chapter is to compare the Stone Age cultures of Cuddapah against the background provided by the above researches and bring out significant similarities or dis-similarities. This would help to know how far Cuddapah fits into the picture of the Indian Stone Age cultures.

Before proceeding with comparison, it is necessary to brief out salient features of the Stone Age cultures of Cuddapah.

The Early Stone Age industry is associated with the basal cemented gravel and include the following tool types: pebble tools, bifaces and uni-faces of various types, cleavers, discoids and retouched and unretouched flakes of various sizes. The pebble tools from about 30% in relation to bifaces and unifaces. But it is a pebble-core-flake complex representing Acheulian character. The artifacts are made of, mostly, water worn quartzite pebbles.

The Middle Stone Age industry comes from the second gravel horizon as well as from surface. The artifacts include i) bifacial tools,
ii) edged tools consisting a variety of scrapers, burins, and iii) pointed tools comprising borers and points of different types, iv) cores and v) flakes. The industry is mainly a flake culture and about 21% of the flakes are detached by prepared core technique with or without facet. Fine to medium grained quartzite is employed as raw material.

The Late Stone Age industry is associated with the third gravel in a direct succession of the previous two gravels each separated by a silt. The artifacts are also collected from surface. They include blades, edged tools, pointed tools, cores, flakes and chips. They are made of chiefly, quartz while chert, quartzite and crystal are occasionally used. The industry is nongeometric in nature.

Keeping in view of all the above features, it is endowed in the succeeding pages to bring out parallels or variations of Stone Age cultures of Cuddapah in relation to the other known cultures in India.

KURNOOL

Kurnool district has attracted the attention of many prehistorians after the pioneer work of Robert Bruce Fouts. Among them are ummitt, Camplade, Zeuner, Peterson, Krishnaswamy and Soundararajan. A systematic study of the region by M. Isaac has brought to light much evidence of the Stone Age cultures in the area. The comparison of the Cuddapah industries with those of Kurnool is based on the evidence obtained by Isaac.

The reconstructed picture of stratigraphy in Kurnool district (Isaac; 1960: 135) is as follows:

1) The implementiferous cemented gravel with a red silt overlying it;

2) The implementiferous, cemented gravel with associated brown-to-grey silt;
iii) Implementiferous very loose gravels with the associated sandy and clayey silts.

The lithic industries associated with the above gravels are series I, series II and series III respectively while series IV tools are found on the surface. Series II tools are also found in red silt overlying the Lower gravel (Isaac, ibid., 140) while basal gravel has yielded Series I and Series II tools. "The appearance of Series II in association with Series I in a geological and climatic context that would correspond to the detrital bed and violent rain phase" is observed and further heavily rolled Series I tools along with Series II tools in the Middle gravel and Series III tools in association of Series II tools in the Middle gravel itself (that is Series I, II and III tools are found in the Middle gravel) have been found. Series III tools, devoid of earlier tools, are found exclusively in the Upper gravel (Isaac op. cit., page 324).

The above reconstructed stratigraphy broadly tallies with that of Cuddapah. The difference is in the associated cultures and the Gulekaryai which lies under the basal gravel in Kurnool.

The Gulekaryai (Calcareous nodules and chunks of karner) rests over the bed rock in the Nallamalai region and nowhere in Cuddapah, the basal gravel rests on the Gulekaryai. This karner bed which contains pebbles at GNP has yielded Early Stone Age tools. Therefore, this is equated with the boulder gravel. In Kurnool this bed is devoid of tools and is equated with the laterite. The three gravels each sealed by a silt are not continuous as in Cuddapah. Further the archaeological evidence in association with the geological context, in Kurnool, gives a confusing picture. It raises doubts whether the tool bearing deposits
yielding Series I and Series II on one hand and Series II and Series III on the other are primary in nature or secondary in origin. In Cuddapah the Early, Middle and Late Stone Age industries are associated with the Lower, Middle and Upper gravels without any mixture of either with the preceding or succeeding industries.

However, there are close typo-technological similarities between the two regions. The Series I tools include choppers, chopping tools, handaxes, cleavers, scrapers, picks and borers. The ratio between the pebble tools and handaxes is $2:3$. All the above types excepting the picks and borers, are represented in the E.S.A. of Cuddapah. The pebble tools, in Cuddapah, from 30.6% in relation to the handaxes in the whole of the region while they are 41.3% at Nandipalle and 44% at Vaddemenu which are type sites. But the pebble element in Cuddapah is a part and parcel of the bifacial industry as that of Kumool.

The raw material employed in both the regions is quartzite while sporadic use of quartz is also seen in Kumool.

The Middle Stone Age tools of Cuddapah include edged tools and pointed tools. These bear close resemblance with Series II tools of Kumool. As in Kumool the industry in Cuddapah is mainly a flake culture. The tools are made on, in both the regions, simple flakes along with blade flakes and blades.

The difference lies in the raw material. Fine graned quartzite is the chief raw material in Cuddapah while fine grained silicious rocks like chert, chaledony etc., are employed in Kumool.

Series III tools are not encountered in Cuddapah. A look at the Series III tools shown from Kumool reveals that some of them show a typical Late Stone Age element.
There is no much difference between the Late Stone Age industry of Cuddapah and Series IV tools of Kurnool except that the geometric forms are very few in Cuddapah, while that of Kurnool is very advanced which is shown by a large number of geometric forms. Besides quartz and other fine grained materials are used in Kurnool while quartz is the chief raw material in Cuddapah.

Thus the Cuddapah and Kurnool industries stand very close in typology and technique.

HELLORE

A large number of stone implements have been discovered from various parts in Nellore district. The collection is mostly from surface and river beds. The section at site 1 (Aiyappan; 1942: 3) shows the following sequence from the bottom upwards: 1) Bed rock of quartz and felspar, the latter disintegrating into clay; 2) Mixed clay regular fragments of quartz, laterite nodules, and scattered chips of quartzite and 3) Sandy clay with laterite nodules. There is a ridge of laterite, at this site, roughly parallel to the sea coast which ends abruptly at Nettukuru Tippa (Tippa = hillock) three kilometres south-west of Nellore. In a gravel pit dug into laterite at locality 3 implements are found insitu as well as on the floor of the pit.

The question of comparing the laterite gravels of Nellore with the basal gravel of Cuddapah arises only when it is secondary in origin and correspond to the boulder conglomerate of Madras. Lateritic formation in Nellore did not take place at all the places. There are also pebbly gravel beds in the rivers like podavagai. If it can be accepted that these two kinds of deposits took place simultaneously then the above laterite gravels yielding implements may well correspond with the basal gravel of Cuddapah.
However, there are close similarities in the lithic industries of both the regions. The pebble tools from Nellore though represent a lesser proportion to handaxes may well be compared with the pebble tools of Cuddapah. The cruder Coup-de-poings of the Abbevillian faces, at Nellore are made on pebbles and the flaking is more from the sides than from the ends. The cruder bifaces of group I from Cuddapah are made on water or worn pebbles and the flaking is from the sides as well as from the ends. Some of the thinner handaxes and cleavers, in Nellore, are made on split pebbles and flakes while their counterparts in Cuddapah are made on flakes. The blade and burin industry of Nellore which is included in the Early Stone Age are very crude and such types do not occur in the E.S.A. of Cuddapah. On the whole the pebble tools and the biface industry of Early Stone Age of Nellore bear similarities with those of Cuddapah.

The raw material employed in both the regions is quartzite.

SOUTHWESTERN ANDHRA PRADESH

Recent explorations by V. Nani Reddy in S.W. Andhra Pradesh covering the whole of Ananta ur district and the western part of Kurnool district, have brought to light several Late Stone Age sites. The industry is mainly non-geometric as that of Cuddapah and comes from the surface collections. It includes cores, flakes, retouched and unretouched blades, blunted back blades, lunates, points, borers and various kinds of scrapers. All these types, except lunates, are represented in Cuddapah.

The raw material in the above region is chiefly chert, while chalcedony, quartzite, quartz, jasper etc., also find their place. Quartz is the chief material in Cuddapah.
NAGARJUNA KONDA

Different tool assemblages, beginning with the Early Stone Age and ending with the Neolithic phase, have been discovered in as many as six localities at Nagarjunakonda.

The cliff section (Soundararajan; 1958 : 57) at locality C shows the following deposits.

1. Highly cemented basal gravel is overlain by a pale whitish kaolinitic mixed silt (I).

2. A second gravel overlain by a silt (II) rests on the silt I

3. A thin layer of a third gravel overlies the silt II. Finally this gravel (III) is covered by a thick mantle of silt as well as banded earth. The total height of the section is 13'.

The gravel beds I, II, and III of Nagarjunakonda can fairly be correlated with the three gravels from Cuddapah respectively. The archaeological evidence from Nagarjunakonda is not brought out from the above gravels except a few specimens from the basal gravel. Thus there is a wide difference, in the archaeological evidence associated with the gravels, between the two regions.

But the tool types found at different localities of Nagarjunakonda have close parallels with those of Cuddapah. The pebble tools, Abbevillian handaxes and large cleatonsian flake axes from Nagarjunakonda correspond well in technique and from to those of Cuddapah. The bifaces with a thinner section, straighter and sharper edges with regular pyriform and triangular shapes along with cleavers are present in both the regions. The pebble element in the above industry is very less than that of Cuddapah.

MALGONDA

The general stratigraphy (S.N. Rao; 1966 : 39) in Nagonda district is as follows:
i) cemented gravel (I); ii) brown sandy silt; iii) gravel (II) and iv) yellow silt.

The above sequence broadly tallies with that of Cuddapah. However, a variation by the absence of a third gravel capped by a silt exists.

The lithic industries associated with the above two gravels in Nalgonda, are of Early and Middle Stone Ages while the Late Stone Age artifacts are collected from surface.

The Early Stone Age industry of Nalgonda consists of i) pebble tools ii) biface; iii) unifaces; iv) cleavers; v) irregularly flaked biface; vi) simple flakes and vii) cores. All these types bear close typological similarities to their counterparts in Cuddapah. But the occurrence of pebble tools, in Nalgonda is less than compared to those from Cuddapah.

The Middle Stone Age culture of Nalgonda comprises single tools and multiple tools which include scrapers of various kinds and points. There is no much difference between the above industry and that of Cuddapah. A few bifacial group of tools found in Cuddapah are not reported from the former area.

The Late Stone Age artifacts from Nalgonda, include single and multiple tool varieties, burins, lunates, blunted back blades and parallel sided flakes. These tool types, leaving lunates, find their parallels in Cuddapah. Not the regions are represented by non-geometric industries.

The raw material employed for Early and Middle Stone Age industries of both the regions is quartzite. The L.S.A. artifacts of Nalgonda, are made of fine grained quartzite, with occasional use of jasper, quartz, crystal, silica and lydianite. Whereas in Cuddapah quartz is
the chief raw material for I.S.A. industry.

CHITTOOR

The stratigraphical sequence of the river deposits in association with the Stone Age cultures in Chittoor district as given by M.L.K. Murthy (1966 : 265) is as follows:

i) The basal gravel (I) overlies by a red silt (I) rests on the weathered bed rock;

ii) A loose gravel (II) dis-continuous in nature over-lies the red silt (I);

iii) Next follows an yellow silt lid against red silt;

iv) Sands and Fossilite nodules.

The former two groups are found almost along Sallekhalva while the last is found in a thin layer only in a single locality. The lithic industries associated with these gravels are of Early and Middle Stone Ages while the blade and burin industry is found in the last gravel which also occurs on the surface in the neighbourhood.

The basal and middle gravels of Cuddapah yielding Early and Middle Stone Age industries correspond to the first and second gravels of Chittoor. The third gravel of Cuddapah has no comparable horizon in Chittoor.

The tool types from Cuddapah are very similar to those of Chittoor. Pebble tools, handaxes of various types, cleavers and edged tools are present in both the regions. But the pebble element in Chittoor is very less (10%) while in Cuddapah it is about 30% when compared to the handaxes. On the whole both the regions fall under biface tradition.

The Middle Stone Age industry characterised by a flake culture is
similar in both the regions.

The blade and burin industry of Chittoor is absent in Cuddapah. The Late Stone Age industry made of quartz is sporadically represented in Chittoor district.

The raw material employed during early, Middle Stone Ages of both the region is quartzite. Thus there is no much difference in typology and technique of Early and Middle Stone Age industries in both the regions.

MADRAS

The localities around Madras have yielded handaxes typical of the facies of Abbevillian-Acheulian stages. They are fairly typical of the rest of India and deserve the name "Madras Industry". The two important localities viz., Vadamadurai and Atturambakam in the Kartalayar Valley are dealt here.

The sequence of deposits in the Kartalayar Valley or Old Palar river (Krishnaswamy; 1947: 33) is as follows:-

Overlying the Pre-Territorial formations is boulder conglomerate which is covered by a detrital laterite. After the deposition of the detrital laterite the river in its erosional and aggradational phases has made three terraces 1, 2 and 3 at 60', 20' and 0' respectively.

No terrace system is established in Cuddapah. But the boulder conglomerate in Kartalayar Valley can be correlated with the basal gravel of Cuddapah.

VADAMADURAI

The most important archaeological evidence comes from Vadamadurai. The tools recovered from the boulder conglomerate, at this site, have been divided into three distinct groups based on patination and typology.
The earliest group containing non-laterised and rolled implements with heavy cream coloured patination is again further divided into two series - (1) Early Series; (2) Late Series. The Early series comprising Abbevillian type of handaxes with pebble butt, crude and irregular shape, and irregular large cores can well correspond to the bifaces of group I and cores from Kanumara and Dokkinoru of Cuddapah. The Late series consisting Early Acheulian Type handaxes with regular forms and step flaking, discoidal cores with alternate flaking and flakes with a patch of cortex on the dorsal surface find their counterparts in Cuddapah excepting the discoidal cores.

The tools of group 2 and 3 at Vadamadurai come from the detrital laterite scaling the boulder conglomerate. The second group consists of Mid-Acheul type handaxes, flatter and neater with more step flaking; pear and tablet forms, discoidal cores and unifaceted flakes. All these types in technique and form are represented in Cuddapah. The third group comprises ovates with flat step flaking, elongated pebble buttied handaxes with pointed tip; flakes showing faceted platforms, a few cleavers correspond to bifaces of group II and III in Cuddapah leaving the faceted plat form flakes.

The new material employed in both the regions is quartzite.

ATTIRAMBAKKAM

Next comes the famous terrace site at Attiramabakkam in the Kartalayar Valley where tools are obtained from the laterised basal gravels to the loam on the top in the exposed section. The assemblage includes a few rolled specimens typologically similar to the first two groups of Vadamadurai while a majority of the tools are fresh and contemporary with the basal laterite gravel. The tool types are handaxes made on flakes, thin, flat and elongated resembling very late Acheul* and
Nicoquin forms; cleavers in abundance and flakes exhibiting Sohan technique. The handaxes and cleavers show vael technique of manufacture. Some of these tool types bear close resemblance to the bifaces and unifaces (handaxes) of Cuddapah. The flakes recovered from the loam are Levallois like and show faceted platform. Probably these might go with the repaired core flakes belonging to the Middle Stone Age of Cuddapah.

Quartzite is the raw material employed, in both the regions.

HYSORE STAGE

Chitaldurg and Chikkamagalur Districts.

The Stone Age implements are discovered (Sehadri; 1956) from a few places mostly from surface. The stratigraphical sequence is not yet well established.

The Early Stone Age implements are found in the laterite debris in the districts of Chikkamagalur and Chitaldurg. The nature of this debris is not known. The industry includes bifacially worked pebble tools, handaxes forming the largest group, cleavers, scrapers, beaked implements etc. The pebble tools, and Abbevillian handaxes correspond, type-technologically, to the biface industry of Early Stone Age of Cuddapah. The more refined group of handaxes and ovates of Mid-Late Acheulian type, cleavers, scrapers etc., find their parallels in Cuddapah industry.

Series II (H.S.A.) tools from Salvadgi, Hathmandevenhalli and Kuchval can be compared with the Middle Stone Age tools from Cuddapah.

* Senorjee reports (I.A.R. 1964-65; 37-38) that the lateritic gravel is not the horizon of Acheulian industry nd the silt not the horizon of post Acheulian.
The Microlithic industry, made on quartz, from Jalalhalli and Kibbanshalli stands closely to the Late Stone Age industry of Cuddapah. The tool types in both the regions include scrapers, points, burins and blades.

The raw materials used for S.S.A. industry of Mysore are quartzite and quartz while quartzite is the only material employed in Cuddapah.

MALAPRABHA BASIN

The stratigraphical sequence (Joshi; 195 45) in the Malaprabha Basin, from the bottom upwards, is as follows:

1) Mottled clay; 2) Cemented old gravel (implacatoferous); 3) Brown sands; 4) Black clays and (5) Red clays.

The above sequence differs from that of Cuddapah. But the basal gravel in the Malaprabha corresponds to the basal gravel of Cuddapah.

As regards the lithic industries, they are recovered from the basal gravel. Most of the tools are made on flakes and the proportion of pebble or core tools is very small. The tools from Malaprabha show Abbevillian, chellean and Levallois techniques of manufacture. The tool types, from Malaprabha, such as hafted with biconical, almond, triangular and other shapes find their parallels in the S.S.A. of Cuddapah. But unlike Malaprabha, the S.S.A. tools of Cuddapah are made on pebbles and cores, while a few are also made on flakes.

The raw materials employed in the Malaprabha S.S.A. industry is fine grained quartzite while sandstone, clay-schist, hematite-schist, hornblend-schist, pitegolite, quartz are also favoured. In Cuddapah, though schist is available from the Cuddapah syst., particularly in the Hella-salades it is nowhere used as the raw material. Quartzitic sandstone is rarely found in Cuddapah.
KRISHNA - GHATAPRABHA

Recent survey by E.S. Pappa (1957) in Krishna and Ghataprabha basin brought to light the evidence of E.S.A. and M.S.A. cultures. The Early Stone Age is mainly an Acheulian industry and some of the tool types exhibit signs of hafting. Handaxes, pebble butted and chisel ended types, beaked tools, cleavers are the main tool types. These types leaving beaked tools bear close resemblance to those of Cuddapah.

The Middle Stone Age industry in the above basin includes scrapers, borers, points, burins, beaked tools and miniature pebble tools. All these types are represented in the Middle Stone Age industry of Cuddapah.

The raw materials used during E.S.A. and M.S.A. in the above region are quartzite and chert while quartzite is the chief raw material during the E.S.A. and M.S.A. in Cuddapah.

MAHARASTRA

KHANDIVLI

The cliff section at Khandivli (Todd; 1939; 259) near Bombay, shows the following stratigraphy - 1) Rock; 2) Lower clay; 3) Lower gravel; 4) Middle clay; 5) Middle gravel and 6) Upper clay. The lower clay has yielded tools.

The difference between the above sequence and that of Cuddapah is that the sequence of cultures begins, at Khandivli, with the implementiferous bluish-brown clay capped by a gravel which is not found in Cuddapah. Secondly a third gravel is absent at Khandivli. Therefore it is difficult to draw any comparison between the two regions.

Later examination of the above section by Lal (57-58; 20) and Sankalia (1963; 47 and 110) differs from Todd's observations. According to Lal some of the deposits owe their origin to re-deposition. The general stratigraphical sequence ascertained by Sankalia shows -
(1) Lower cemented gravel; (2) silt; (3) Rubble gravel; (4) Silt and (5) sluich soil (humus). Thus two cycles of deposition and erosion are recognised. The implements collected from the basal gravel; overlying silt and sand; rubble gravel and its junction with the top humus. The assemblage comprises (a) large and small cores with deep flake scars, (b) corresponding flakes with large prominent under surface and a diffused bulb, (c) cores with occasional parallel flake scars, (d) prepared core flakes with facetted platforms (e) scrapers, (f) points and borers (g) burin like pieces.

This industry by its nature and form characterises the N.S.A. industry discovered in other regions and this may correspond with the N.S.A. industry of Cuddapah.

The Microlithic industry which probably succeeded the N.S.A. is geometric in nature and very advanced in technique. Therefore no parallels exist between the Microlithic industry of Bombay and that of Cuddapah.

PRAVARA

A cliff section (Sankalia; 1956 : 33) on the Pravara shows the following sequence - (1) Gravel I yielding Series I tools; (2) Yellowish brown fissured clay; (3) Gravel II yielding Series II tools; (4) Yellowish brown silt; (5) Gravel III yielding Upper Palaeolithic implements.

The above sequence of layers correspond to those of Cuddapah excepting the top silt sealing the third gravel which is absent at Kovana, the type site. The archaeological evidence obtained from gravels I and II correspond to Early and Middle Stone Age industries recovered from gravel I and II respectively in Cuddapah. The fossil evidence along with the archaeological data at the above site is absent in Cuddapah.
As regards the typo-technological similarities, most of the Series I tools at Nevasa display close resemblance to those of E.S.A. in Cuddapah. Some of the pyriform or fish-like handaxes, cleaver-like handaxes at Nevasa are also represented from Cuddapah. A few choppers from Nevasa show such flaking extending all over the surface giving more a scraper look, while the pebble tools from Cuddapah exhibit a primitive technique; besides a few specimens with stop flaking also occur. The occurrence of pebble tools in Cuddapah is more than at Nevasa which might be due to favourable ecological factors.

The Series II tools at Nevasa called by Banerjee as "Nevasian", typologically and stratigraphically correspond to the Middle Stone Age artifacts of Cuddapah. The flakes detached by prepared core technique are seen at both the places.

The raw material used for Series I industry at Nevasa is fine-grained basalt and for Series II in ustryl, chert, jasper, agate and chalcedony while quartzite has served as raw material for Early and Middle Stone Age industries in Cuddapah.

GANGAVADI (GODAVARI)

The cliff section exposed (Sankalia; 1952: Fig.6) at locality I at Gangawadi revealed the following sequence of layers from bottom upwards - (1) Micaeous clay; (2) Gravel with occasional pebbles; (3) Cemented gravel; (4) Kankary gravel; (5) Gravel with pebbles; (6) Silty earth and (7) Fine gravel.

It is not advisable to draw any comparison between this section of several layers with those of Cuddapah. Most of the tools at the above site are recovered from the lowermost gravel.

The tools are made mostly on the flakes and a few on cores. Many
of the cleavers do not possess the parallelogramatic cross-section. Cankalia puts the industry, on the typological ground into an advanced or late Abbevillian-Acheullian age. One of the bifacial tools of Cuddapah bear close resemblance to those of Gangawadi. The cleavers from Cuddapah have parallelogramatic cross-section while those from Gangawadi do not possess this character indicating that the cleavers from Cuddapah are cruder than those from Gangawadi.

MADHYA PRADESH

NARMADA

De Terra studied Narmada between Nashangabad and Narasingpur. The stratigraphical sequence (De Terra; 1939: 313-316) portrayed on the Narmada sediments is as follows:

(1) Lower group consisting basal conglomerate and a overlying red concretionary clay; (2) Upper group comprising cemented sandy gravel overlain by a pinkish concretionary clay and resting disconformably over the lower group and (3) Black cotton soil group composed of sandy gravel and black cotton soil.

Khatri's observations (1961: 526) show that the basal most deposit is the red concretionary clay but not the boulder conglomerate as said by De Terra. Excavations at Mahadeo Riparia by S.C. Sujekar have confirmed De Terra's observations on the Narmada sediments. Recent investigations by Cankalia, Kakomi and others have revealed a complex stratigraphical sequence and any comparison of Cuddapah sequence of gravel deposits with the Narmada sediments may not be of much use. Therefore the comparison is confined to the lithic industries only.

The boulder gravel has yielded flakes with prominent bulbs, Abbevillian handaxes and Acheullian tools. The red clay has yielded
several unrolled flakes and fresh Acheulian bifaces.

The basal gravel at Machiyo Piparia has yielded choppers on pebbles and flakes, handaxes, cleavers, flakes and cores. It is more or less a flake dominated industry. This industry bears close similarities with the Cuddapah biface industry in general and Tamballapalle (Kammuru) in particular which include massive flakes having been removed from big cores.

These flakes are worked along the sides. As at the above locality the industry from Tamballapalle is also mainly a flake predominant culture.

The Middle Stone Age industry from the Narada comprises scrapers, points, burins, diminutive choppers, and handaxes. They are associated with vertebrate fossils and are recovered from sandy pebbly gravel.

All the above types are also included in the Middle Stone Age industry of Cuddapah.

The raw materials employed during B.S.A. in both the regions is quartzite. The Middle Stone Age industry in the Narada is made of chert, jasper and chalcedony while that of Cuddapah is made of quartzite.

MACHESWAR

A more clear picture of the Narada stratigraphy is found at Macheswar by Sankalia and Subba Rao. The sequence of layers (Sankalia, 1963 : 53) is as follows:

1. Bed rock; 2. Cemented pebbly gravel; (3) Pinkish silt; (4) Pebbly gravel (II) (not well cemented); (5) Pinkish silt; (6) Small trap gravel (III); (7) Brownish silt; (8) Kankary silt and (9) Black soil. Two distinct terraces at the height of 27 and 10 metres from the water level have been recognised.

The above sequence of deposits except no layers 6 and 9 may correspond to that of Cuddapah.
The cemented pebbly gravel at Kheowar has yielded large number of cores, big high angled flakes some of which are turned into scrapers and choppers and Sankalia opines that these high be pre-sohan tools mentioned by vis no. Associated with these flakes are a few Abbevillian handaxes, ovates, and other finer handaxes of Acheulean type and also cleavers. On the whole of the assemblage is dominated by flakes, cores and cleavers. These tool types bear close resemblance to the flat base (primary under surface) tools in pebbo tool group, cleavers and bifaces of Cuddapah N.S.A. industry.

The gravel of the second terrace at Kheowar as in Cuddapah has yielded the Middle stone age in untralade on quartzite. Thus both the regions bear close similarities in typology, technique and raw material during early and Middle stone ages.

MALWA

The river Shwma, a tributary of the Chambal has shown the following stratigraphy (Khatri; 1950; 98) - (1) Basal trap rock; (2) Cemented pebbly gravel; (3) Yellowish silt and (4) Fine well cemented gravel. The above two gravels can be compared with the lower and middle gravels of Cuddapah. A silt, covering the second gravel and a third gravel covered by a silt are absent in Malwa.

The cemented pebbly gravel of the Shwma river has yielded very large flakes of trap and handaxes, cleavers and scrapers of Abbevillian and Acheulean character. This in untry fairly corresponds to the Early stone age in untry of Cuddapah in typology and technique with a difference in the occurrence of pebble tools which are very less in Malwa. Scrapers, points and borers are the main tool types in the Middle Stone Age of both the regions. These tool types are recovered from the second gravel horizon. The Late Stone Age in both the regions is non geometric. But the L.S.A. industry in Malwa has no stratigraphical position as found in Cuddapah.
The raw materials employed in Malwa durin Early, Middle and Late Stone Ages are haematite quartzite, fine grained silicic material and chalcedony respectively, while the picture is different in Cuddapah.

**BANAH AREA**

The explorations carried out by Joshi (1961: 10) in Banah and Senhor districts have brought to light a number of Early, Middle and Late Stone Age sites.

Two cycles of aggradation and erosion have been established by Joshi. The Early Stone Age industry, recovered from lower gravel horizon, comprises handaxes on cores and flakes, cleavers, pointed tools and scrapers and are characterised by Acheulian and Abbevillian techniques. The M.S.A. industry of Cuddapah bears many similarities in technique and type. No flake tools appear to be absent in Banah region.

The Middle Stone Age assemblage which Joshi termed as "Flake-blade-scraper assemblage" has been recovered mainly from the surface and a few from the upper gravel as in the case of Cuddapah. The flakes and blade flakes are found in large number where the blades are products of prepared core technique. The tool types include scrapers, points, borers, flakes, blades and cores. The above industry displays close type-technological similarities with the Middle Stone Age industry of Cuddapah. As in Benah industry, the prepared core flakes form a good percentage (21%) in Cuddapah. The variation is that burins, a few choppers and diminutive bifaces are absent in Benah industry.

**ORISSA**

The general stratigraphy of the river valley pleistocene deposits of Orissa (No apatre; 1962 : 56) is as follows:
(1) Bed rock; (2) Bottled clay; (3) Cemented coarse gravel; 
(4) Thick layer of red silt; (5) Fine gravel and (6) Red silt. This 
sequence broadly agrees with that of Cuddapah excepting the third gravel 
and silt which are absent in Orissa.

The E.S.A. industry of Orissa is divided into three stages based 
on their technique of manufacture. The tool types include handaxes of 
various shapes, cleavers, flakes, cores, points and discoids. These 
tool types closely resemble those from Cuddapah. But the occurrence 
of pebble tools in Orissa is very less when compared to those from 
Cuddapah.

The Middle Stone Age industry of Orissa which comes from open 
air sites and stratified deposits, comprises scrapers of various kinds, 
points, borers, burins, flakes, cores, blade flakes and nodules. The 
stratigraphic position, technique and typology of the above industry 
correspond to that of Cuddapah.

The Late Stone Age industry also bears close similarities with 
that of Cuddapah with a variation in the raw material.

Quartzite is the chief raw material employed for E.S.A. industries 
in both the regions. Opal, chert, jasper, quartzite and quartz have 
served in Orissa, during Middle and Late Stone Ages while quartzite 
and quartz were the raw materials used for Middle and Late Stone Age 
industries of Cuddapah.

WEST BENGAL

Recent explorations by Sen, Ghosh and Chatterji on the rivers 
Kasai, Kumar, and Manjura nallah in Bankura district have brought 
to light Stone Age industries. The general stratigraphy (Sen, Ghosh and 
Chatterji; 1963: 106) is as follows:

(1) Bed rock; (2) Whitish gravel; (3) Detrital laterite with
gravel; (4) Reddish gravel in ferruginous matrix and sandy alluvial.

Tools come mainly from third layer and are stained red due to contact with laterite. They comprise choppers, scrapers, handaxes and a small percentage of cleavers with an inferior workmanship. Some of the above tool types can be compared with some of the Early Stone Age tools of Cuddapah.

Quartz and quartzite are employed in the above region while quartzite alone served as raw material in Cuddapah.

BIRBHANPUR

Lal (1958: 143) excavated a Microlithic site near Birbhupur on the bank of the Damodar river. Lal assigns the Birbhupur microlithic industry, on the basis of contemporary cultures in the subcontinent and geological context in Birbhupur itself, to early part of Holocene.

The tool types include (1) Irregular cores; (2) Fluted cores; (3) Blades; (4) Lunates; (5) Points; (6) Borers; (7) Scrapers and (8) Barins. The above industry is mainly non-geometric. The Late Stone Age industry of Cuddapah includes all the above types except the lunates which are also non-geometric industry.

The raw material is mostly milky quartz while crystal, chert, chalcedony, quartzite and fossil wood are occasionally used at the above site. Quartz, mainly dull, is the chief raw material while occasional appearance of chert, Jasper and quartzite are seen in Cuddapah.

BENAR

SINGHBHUM

The river Roro in the Singhbhum District has been surveyed by Sen and Ghosh. They observed three terraces (1960: 131) at the heights of 20, 13 and seven metres on the river Roro at Chibasa near Chakradharpur
These terraces are associated with gravel beds. The gravel from the top most terrace has yielded Early Stone Age tools. They comprise pebble butted handaxes, Abbevillian and Acheulian handaxes, cleavers and bifacial choppers.

The lithic tool types from the above locality stand very close to those from Cuddapah which include all the above tool types. The pebble element at the former site is less than that of Cuddapah.

Various rocks such as quartz, quartzite, jasper, chert and basalt are employed in the Early Stone Age industry of Singareni while quartzite alone is used in Cuddapah.

UTTAR PRADESH

SINGARENI BASIN

Krishnaswamy and Soundararajan (1961) have surveyed the Singareni basin in Mirzapur district of Uttar Pradesh. The stratigraphy noticed on the Rihand river (1951: 45) is as follows:

1. Bed rock; 2. Gravel bed; 3. Red silt; 4. Gravel bed and 5. Red silt. This sequence correlates with the Lower and Middle gravels each sealed by a silt, in Cuddapah while the third gravel and silt are absent in the Singareni basin.

As regards the archeological evidence, the Early Stone Age implements have been recovered from the lower gravel at the above basin. The tool types comprise pebble and core (chopper-chopping) tools forming 15% of the total type, Abbevillian-Acheulian handaxes and cleavers forming 43%, numerous flakes of which 10% are proto-Levalloisian type and 7% Levalloisian type. The occurrence of a substantial percentage of pebble tools has made Krishnaswamy (1951: 61) to suggest that this region is meeting ground of the sohan and Andra cultures. But later explorations in different parts of the country have shown that the pebble tools are
a part and parcel of the bifacial tradition and as suggested by Sankalia (1963: 277) these tool types predominate where pebbles are in abundance in the river bed (upstream of any river). Sankalia’s observations are also corroborated by the presence of typical Sohan pebble tools, in Cuddapah region, which are however, part of a bifacial complex.

All the above tool types, excepting proto-and Levalloise flakes, find their parallels in the Early Stone Age industry of Cuddapah.

The microlit industry from the Singrauli basin is mainly non-geometric as that of Cuddapah.

The raw material used for L.S.A. industry in both the regions is quartzite, while quartz is employed for L.S.A. industry in both the regions.

Thus the Singrauli Stone Age industries, excepting the L.S.A. which is absent in the above area, bear striking similarities with those of Cuddapah.

PUNJAB

SIRSA VALLEY

Son has studied a site at Kalagarh in the Sirsa Valley of Punjab. Three terraces (1959: 178) at the heights of 23, 13 and three metres respectively from the present river bed have been observed. The tools consisting of choppers and scrapers have been collected from first two terraces. Many of the choppers of Kalagarh closely resemble the bifacial oblates of Cuddapah.

BEAS AND SANGANAGA VALLEY

Lal (1956: 59-92) has discovered Sohan type of tools in the Beas and Sangana valley in Kangra district. Five terraces (Lal: 1956: 61) at the height of 1.8, 105, 50, 30 and 10 metres from the water level
have been recognised.

No terrace system is established in Cuddapah. Therefore the comparison stands only on the lithic industries. The tool types from the above valley include unifacial and bifacial handaxes, cleavers, and proto-levelloise flakes. These tool types bear striking similarities with the flat based tools, unifacial and bifacial oblates and the pebble buttressed handaxes of group I, and II of Cuddapah. Proto-levelloise flakes are not encountered in Cuddapah.

RAJASTHAN

The survey carried out by Nigra in the valleys of the Jumna, Sambhar, Chambal and the Jumna along with their tributaries in the Western and Eastern Rajasthan have brought out several stone age sites. The cycles of aggradation and erosion have been established in the eastern part of Rajasthan while in the Jumna valley of the western portion, the first cycle of aggradation and erosion is missing; instead the second one directly rests on the bed rock (Nigra: 1961: 63).

The above sequence is very similar to many sections in Peninsula in general. The only difference between the above sequence and that of Cuddapah is that in the former a third gravel covered by a sil is absent which is observed in Cuddapah.

The Early Stone Age industries from Rajasthan are obtained from the basal cemented gravel as well as river beds and surface as in the case of Cuddapah. The tool types of the above region include pebble tools, handaxes of all types, cleaver, discoids, flakes and cores. The assemblage is a mixed industry exhibiting crude and fine workmanship. These tool types particularly handaxes of various kinds find their counterparts in Cuddapah. The difference is in the occurrence of prepared core technique in Rajasthan which is absent in Cuddapah.

The Middle Stone Age industry comes mainly from the Wagen and
Kadmalí Valleys (Misra; 1967: 73). The reason that Misra gives for the absence of this industry in other regions is the non-availability of fine grained silicious material. But in Cuddapah the locally available raw material whether it is quartzite, chert, jasper or chalcedony has been used for the R.S.A. industry.

The tool types in Rajasthan include miniature hatchets, flake knives, cleavers, scrapers, points, borers, scraper borers, flake blades, prepared flakes and tortoise cores. All these types excepting cleavers and tortoise cores are represented in Cuddapah R.S.A. industry.

The evidence of Late Stone Age industry comes from the stratified deposits (Misra; 1967: 107) as well as open air sites. A large collection of microliths has been made from a number of sites. The tool types include microliths including backed blades, obliquely retouched blades and lunates, simple and tanged points, borers, several types of scrapers and notched flakes. All the above tool types leaving lunates, bear close similarities with those of Cuddapah. The L.S.A. industry from both the regions is non-geometric.

The raw material employed for the R.S.A. industry in both the regions is quartzite. The R.S.A. industry of Rajasthan is made on chert, jasper, cherty quartzite, cherty sandstone, quartz while quartzite is the chief raw material in Cuddapah. Various fine grained rock materials such as chert, chalcedony, jasper, quartzite and quartz are employed for L.S.A. industry in Rajasthan whereas quartz is the main raw material in Cuddapah.

GUJARAT

The systematic study of the Sabarmati, the Sardara and the Karjan in northern and central Gujarat by Bankalia, the work carried out by Zeuner on the riverine and saline deposits of the rivers in Gujarat to
to understand the past environments prevailing during the pleistocene times have brought to light much archaeological and geological evidence in Gujarat.

Zeeuner (1950; 23-24) has shown the following sequence of deposits and their associated climatic conditions.

<table>
<thead>
<tr>
<th>Geology</th>
<th>Climate</th>
<th>Archaeology</th>
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<tbody>
<tr>
<td>Soil formation</td>
<td>Modern Phase</td>
<td>-</td>
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<tr>
<td>-</td>
<td>Dry</td>
<td>-</td>
</tr>
<tr>
<td>Soil Development</td>
<td>Wet</td>
<td>Pre-pottery microlithic phase</td>
</tr>
<tr>
<td>Dunes</td>
<td>Dry</td>
<td>-</td>
</tr>
<tr>
<td>Flat land surface</td>
<td>Wet</td>
<td>-</td>
</tr>
<tr>
<td>Fine silt and wind blown sand</td>
<td>Dry</td>
<td>-</td>
</tr>
<tr>
<td>Red soil</td>
<td>Wet</td>
<td>Palaeolithic man disappears</td>
</tr>
<tr>
<td>Silt</td>
<td>Dry</td>
<td>Palaeolithic man continue</td>
</tr>
<tr>
<td>Cemented gravel</td>
<td>Wet</td>
<td>Palaeolithic man</td>
</tr>
<tr>
<td>Mottled clay</td>
<td>Dry</td>
<td>-</td>
</tr>
<tr>
<td>Lateritic</td>
<td>Wet</td>
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</tbody>
</table>

Without going into the hypothetical climatic change the above sequence except G, R and S, broadly disagree with that of Cuddapah. Therefore an attempt is made here to bring out typo-technological similarities of the archaeoliths of both the regions.

Sankalia has made a large collection of the U.S.L. artifacts consisting handaxes, cleavers, discoids, pebble tools, flakes and huge cores having one or two flakes being removed alternately. All these tool types are found in the lowest gravel and on the basis of technique are divided into two groups.
1) Tools with irregular outline, deep, concave flake scars and also rough step flaking, pebble cortex at the butt end or over part of the both surfaces. These resemble closely Acheulian types. These tools closely stand in comparison with the bifaces of group I, in Gudapah, which include handaxes with deep flake scars, irregular outline and pebble butt end.

2. This group of tools are characterised by regular outline, fine wavy edge, comparatively smooth step flaking, no pebble cortex or a patch of cortex at definite places. These are comparable to the Mid-Acheulian types. This group of tools bear close similarities to the bifaces of group I of Gudapah.

The Middle Stone Age culture, for the first time, is brought to light by Soundaranjan in Naira (1961: 1968-179) and Saurashtra (1968-1964: 21) districts in Gujarat. They are recovered from fine gravel on the river Khoar.

WEST PAKISTAN

The Kotwar Region.

The Yale Cambridge expedition led by De Terra has made, for the first time, a systematic study of the pleistocene deposits and associated stone industries in the Kotwar region and Kashmir Valley.

The archaeological aspect is not duly dealt by De Terra (1939). However, recent publication by Paterson and Drummond (1962) gives a detailed account of the Stone Age cultures of the above region. The Indus and Sohan basins revealed the following prehistoric cultural sequence ranging from Middle Pleistocene to Upper Pleistocene times.

SOMA OF THE MIDDLE PLEISTOCENE

A. Pre-Cohen

This group of tools occur in the boulder conglomerate. They
include pebble tools (unilateral nucleates) and flakes which are large with a big striking platform at high angles. Retouch is absent but show battered marks. The raw material is quartzite. These tools and flakes correspond to the bifacial oblates and some of the flat based tools with primary under surface from Cuddapah. The massive flakes and medium size flakes from Trabellaepale, may well correspond to the pre-Sohan flakes.

B. The Lower Sohan

The artifacts of this group occur on the high depositional surface (Petterson; 1962: 60) of the boulder conglomerate. Sohan type tools (convex oblates and nucleates) are very common. Cores and flakes form nearly half of the total group and the flakes show used marks but not retouch. The tool types consist of (1) flake base with split surface, (2) oblates and (3) nucleates. These types bear close similarities to the flat based tools, unifacial and bifacial oblates of Cuddapah while the cores described in the former are absent in Cuddapah.

C. Middle Sohan A

Core flake element is dominant and the implements include cores and Sohan type tools. The implements are large and heavy, flakes exhibit low angled platform and simple flaking and the working edges are refined by step flaking. These tool types correspond to the flat based tools, unifacial and bifacial oblates with various kinds of edges having step flaking. from Cuddapah.

D. Middle Sohan B

The artifacts comprise Sohan type tools, cores and flakes. The Sohan element is dominant and the retouch on the flakes is poor. These types resemble to some of the pebble tools from Cuddapah.
SOHAN OF THE UPPER PLEISTOCENE

A. Upper Sohan A

The proportion of the Sohan type tools is found to decrease in this group. The majority of the tools are unworn and unpatinated. All the different Sohan types are fairly represented amongst which unilateral nucleates being very common. The majority of the flakes have simple platform.

B. Upper Sohan B

The artifacts of this group include pebble tools and flakes with unfaceted and faceted platforms. The tools are fresh and patinated.

The K.U.A. industry of Suddapah which includes a few pebble tools, flake tools, and flakes with or without faceted platform may correspond to Upper Sohan A and B industries.

SOHAN OF THE FINAL PLEISTOCENE

The tools of this group come from Dhek Puthan and Hindigheb. They are not different from the Middle and Upper Sohan groups. Some of the tools are made on trap.

THE CLACTONIAN INTRODUCTION

A. Upper clacton A

Sohanian tools are completely absent in this group. The main artifacts are cores and flakes. This is suggestive of a new industrial tradition of intrusive character. Many of the cores are like Mousterian disc cores. Flakes suggest the predominance of faceted cores and convergent preparations, half showing platform preparation. This group belongs to the Upper Pleistocene period and correspond to Upper Sohan A.
B. Upper clacton B

The artifacts consist, in this group, of developed cores and flakes. The flakes are triangular in shape or blade-like and about one third have the prepared striking platform. The Middle Stone Age industry of Cuddapah comprises flake tools made on simple flakes of various shapes exhibiting either clacton or prepared core technique with or without faceted platform; blade flakes with or without faceted platform resembles that of Upper clacton A & B industries which also include the above types. The difference is that the Mousterian element is not well established in Cuddapah.

C. Upper Acheulian clacton

Bouches (handaxes) appear in this group, besides cores and flakes.

STELLENSBOSCH INVASION

From the basal cemented gravel below the re-deposited loess at Chakeigh (Petersen, 1962: 32) is found an assemblage consisting of bouches, cleavers, cores and flakes. Sohan type tools are absent.

Middle Stellenbosch

Born bouches and cleavers have been found. The flaking is coarse and incomplete and these correspond to the earlier stages of the East African Stellenbosch.

Upper Stellenbosch (Upper Pleistocene)

This group is characterised by rough and better made tools. The outlines are asymmetrical and forms quite distinctive and line of profile almost straight. The following are the main forms of bouches: ovates, pointed ovates, foliace pyriform, triangular, lingulate etc.

The Stellenbosch industry of the above region finds its parallels in the biface industry of U.S.A. in Cuddapah which also includes all the above types.