CHAPTER - VI
NEOLITHIC CULTURE

Packed and ground stone industry

The Neolithic culture which succeeds the Mesolithic culture has only a limited occurrence in the Eluru river valley. The Neolithic evidences are available in the form of ground stone tools and pottery. There are also chipped stone microlithic tools associated with these. The ground stone artifacts are 26 in number and they were collected at seven sites. They include edge tools such as axes, adzes, small celts and non-edge tools such as perforated stones and a rubber stone. The ground stone edge tool types give the impression of Eastern Indian Neolithic affiliation.

Of the total number of seven sites five were located on the river Eluru, and one each on the Donigedda and the Madieru, the artifacts were collected on top of the red silt of the older alluvium of the Eluru river. The largest collection was made at Uppalapadu, which is the type site of the Neolithic culture in the area. The type-wise and site-wise distribution of these tools are as follows.
The chief raw materials employed in the manufacture of the ground tools are charnockite, Khondalites and sandstones which are locally available. The occurrences of these rocks have already been dealt in the Chapter II. The edge tools were preferably made on Charnockites and Khondalites, whereas the non-edge tools were made on sandstones and Khondalites.

All the tools are fresh looking with margins not wornout. Hence the tools belong to the same localities in which they are found now and have not been transported from elsewhere. Most of the tools bear slight reddish stain on the body suggesting their association with the top red sandy silt with which they were in contact.
The techniques employed in the preparation of ground stone tools are very similar to those described by Foote (1916: 85), Subba Rao (1949: 142-3), Allchin (1957: 323, 1960: 85-86) and Sankalia (1964: 80-2). The three techniques outlined by them such as pecking, edge grinding and full form grinding, at three stages were employed by the Neolithic man in the manufacture of these tools. The present collection has few pecked examples and nearly all the specimens are edge ground or fully ground ones.

**Typology**

The tools are classified on the basis of Sharma's (1966) classification for Eastern Indian Neolithic ground stone industry. The edge tools are broadly divisible into three categories as

<table>
<thead>
<tr>
<th>Type</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Axes</td>
<td>1</td>
</tr>
<tr>
<td>Adzes</td>
<td>8</td>
</tr>
<tr>
<td>Small celts</td>
<td>6</td>
</tr>
<tr>
<td>Total</td>
<td>15</td>
</tr>
</tbody>
</table>

They represent 57.69 percent of the total collection of pecked and ground stone tools. Next in order are the perforated stones which represent 38.46 percent of the total collection. The last and least category the rubber stone represented by a single example. (3.85%)
Ground stone Edge tools

There are altogether 15 specimens of this category divided as axes, adzes and small celts as mentioned previously. Among these adzes are predominate with varying shapes and sizes. Next in order of frequency are the bifacially ground small celts with varies shapes. A single specimen of rounded butt axe is a significant type in the collection. Since the collection is meagre, all the specimens are illustrated and described below.

Rounded Butt Axe

This category is represented by a single specimen.

UPP - 2 (Fig. 29, No.7)

It is a medium sized rounded butt axe, pecked and ground. It has convex surfaces, lenticular cross section and a broad bifacially ground median cutting edge. The pecked marks are retained at the periphery of the butt end and use-marks are obvious on the cutting edge. The sides taper towards the butt end which has rounded corners. (6.0 x 4.3 x 1.5 cm)

Adzes

This type is represented by 8 specimens. An adze according to Coghlan (1943:29) is "a tool for chopping or slicing away the surface of the wood."
The cutting edge stands transversely, that is at right angles to the handle. It bevel is ground on the inner face only, while the entire outer surface is slightly rounded.

These were prepared on flakes of either rectangular or triangular form. The specimens are all edge ground and fully ground forms. All of them show plano-convex cross section both in vertical and horizontal planes. All the specimens possess median cutting edges which are straight (2) or convex (6). The largest tool measures 7.4 x 3.8 x 2.0 cm whereas the smallest one 3.4 x 3.2 x 1.2 cm. The average size of the adze measures 5.1 x 4.6 x 1.4 cm.

All the tools bear use-marks on the cutting edges. There are three broken specimens in the collection of which one shows indication of reuse.

Adzes are subdivided into 3 types based on the shape of the implement.

<table>
<thead>
<tr>
<th>Type of Adze</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rounded Adzes</td>
<td>3</td>
</tr>
<tr>
<td>Quadrangular Adzes</td>
<td>1</td>
</tr>
<tr>
<td>Rectangular adzes</td>
<td>4</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>8</strong></td>
</tr>
</tbody>
</table>

Rounded adzes

LBRT - 1. (Fig. 31, No. 24)

This is also a fully ground implement. It is
a long broad, rounded adze with unifacially ground edge from flat ventral surface. It has a broad convex and bevelled cutting edge, cross section plano-convex. (7.0 x 5.3 x 2.0 cm)

UPP - 7. (Fig. 31, No. 29)

It is a medium sized rounded adze of fully ground form. It has a broad sharp cutting edge and plano-convex cross section. Use-marks on the cutting edge and pecked marks on the ventral surface are visible on this tool as on the above. (6.0 x 4.5 x 1.7 cm)

UPP - 1 (Fig. 33, No. 47)

This is a packed and ground type. It is a long-rounded adze with a slightly convex cutting edge. It has a flat ventral surface and convex dorsal surface. The cross-section is plano-convex. Cutting edge alone was ground on the dorsal surface whereas the ventral surface retains pecked marks. (7.4 x 3.8 x 2.0 cm)

Quadrangular Adze.

Only one specimen is available of this type.

UPP - 10 (Fig. 29, No. 1)

This is a fully ground specimen of long quadrangular adze with rectangular cross section. Cutting edge is broad convex unifacially worked and shows use-marks. It is flat on both dorsal and ventral surfaces and even at the butt end. Sides have symmetrical outline, tapering towards the butt end with angular corners. (6.3 x 3.8 x 1.6 cm)
Rectangular Adzes

There are altogether 4 specimens of this type, and all have ground edges.

UPP - 5 (Fig. 33, No. 42)

A long parallel sided adze with flat ventral surface and convex upper surface. Cutting edge was unifacially ground from ventral surface. It has a sharp convex cutting edge with plano-convex section and shows use-marks. (7.1 x 3.4 x 1.5 cm)

Two other specimens of the type UPP-4 (Fig. 29, No. 6) and 8 (Fig. 32, No. 39) recovered are in half-broken condition.

UPP - 6 (Fig. 30, No. 12)

Broken artifact reused by pecking at the periphery of the broken end to shape it as butt. It has a sharp convex cutting edge with plano-convex section and use-marks on the working end.

Small Celts

These are represented by 6 specimens, which are small and bifacially ground. The largest specimen measures 5.1 x 4.6 x 1.4 cm and the smallest 3.4 x 3.2 x 1.2 cm. They are sub-divided basing on the shape as :
Quadrangular Celts •• 2
Triangular Celts •• 3
Trapezoidal Celt • * 1
Total  :  6

Quadrangular Celt

This category is represented by two specimens.

WTP - 1 (Fig. 31, No. 28)

A quadrangular celt of medium size with broad convex sharp cutting edge and rectangular cross section. The cutting edge is bifacially ground. The butt end is also broad with angular corners. It is a fully ground specimen (5.1 x 4.6 x 1.4 cm)

Similar but a half-broken celt (Fig. 30, No. 21) was found at Marrividu. Working edge is missing and only butt end is found. Butt end is square and shows quadrangular cross section.

Triangular Celts

This type is represented by 3 specimens.

UPP - 3. (Fig. 30, No. 16)

It is a small roughly triangular celt with flat sides. The cutting edge was bifacially ground resulting in prominent convex sharp cutting edge with rectangular cross section, working edge shows use-marks. The butt end is thick and slightly tapers to a point. It belongs to pecked and ground variety. (4.3 x 3.6 x 1.4 cm)
SPKL - 1 (Fig. 30, No. 17)

This is the smallest celt among the finds and closely resembles the specimen UPP-9. The cutting edge is convex and the section lenticular (3.4 x 3.2 x 1.2 cm)

UPP - 9. (Fig. 32, No. 41)

This is another small triangular celt with rounded butt end and bifacially ground sharp cutting edge. The section is roughly rectangular. (4.9 x 3.5 x 1.2 cm)

Trapezoidal Celt

A single specimen is represented in this category.

MRV - 1. (Fig. 33, No. 49)

It resembles the specimen UPP-3 but the shape is trapeze like, with broad cutting edge and square butt end. It has a rectangular cross section and belongs to pecked and ground variety. (3.5 x 3.8 x 1.2 cm)

Ring stones or perforated stones

This category is represented by 10 specimens in the total collection. These are thick massive rectangular, squarish or oval stones with a well drilled central hole. The central hole with hour glass section indicates that it may have been attained
by pecking or drilling alternately from both the surfaces to the centre. Except two, all the specimens are half broken. Out of the two complete specimens one is small and oval in shape and under preparation. The other one is the largest of all and is roughly quadrangular in shape. Most of them are flat on either surfaces and exhibit 0° or half circle cross section.

YLW - 1 (Fig. 32, No. 32)

Is a small and oval in shape, and under preparation, Khondalite, Fresh.

YLW - 2 (Fig. 35, No. 57)

Is a half broken rectangular ring stone with hour glass perforation - Khondalite, Fresh.

LKV (Fig. 35, No. 58)

Is a broken ring stone of a rectangular shape with hour glass perforation at the centre, Khondalite, Fresh.

LBRT. (Fig. 36 No. 59)

Is a large quadrangular ring stone with hour glass perforation at the centre. Use-marks on the periphery, Khondalite, fresh.

Rubber Stones (Fig. 34, No. 52)

This category is represented by a single broken specimen of quadrangular shape. Both ventral and dorsal surfaces are flat and smooth and show use-marks. Khondalite, Fresh.
Blade Industry

The Neolithic culture is associated with blade industry besides the pecked and ground stone industry. This blade industry is one of the integral traits of almost all the Neolithic and Neolithic-Chalcolithic cultures of the Indian Sub-continent.

The blade tools vary in number from site to site in the area under study. Eight Neolithic sites have been discovered in the valley. Out of them five have been located on the main course of Eluru and the rest, one on each of the three tributaries. All are open air primary sites, situated on the flanks or foot of hills and near to water courses. Among them Uppalapadu on the Eluru is the type site represented by a good number of artifacts and the other sites on the river are all situated within a distance of 25 Kms from it.

The lithic blades are fashioned out of crypto crystalline materials such as chart, agate, carnelian etc., as in the case of the Mesolithic blades. The following table gives the raw material analysis of the Neolithic blade industry.
The raw materials are available in the form of small water worn pebbles. Quartz and Quartzite are available however, in the form of veins and bands in the local outcrops. These are dealt in detail in the chapter II.

The type-technological study of the Neolithic blade tool assemblages reveals that they bear close similarity to and are identical with the Mesolithic assemblages of the region, but differ from the Neolithic-chalcolithic blades of South India in respect to technology. In the latter, crested guide ridge technique was commonly used for the detachment of blades whereas it is completely absent in the Eluru Valley. Here the blades were detached by fluted core technique as observed in the Mesolithic assemblage of the area.

<table>
<thead>
<tr>
<th>Raw material</th>
<th>No.</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chert</td>
<td>174</td>
<td>37.64</td>
</tr>
<tr>
<td>Agate</td>
<td>94</td>
<td>20.34</td>
</tr>
<tr>
<td>Camelian</td>
<td>89</td>
<td>19.27</td>
</tr>
<tr>
<td>Chalcedony</td>
<td>45</td>
<td>9.74</td>
</tr>
<tr>
<td>Rock crystal</td>
<td>20</td>
<td>4.33</td>
</tr>
<tr>
<td>Quartz</td>
<td>28</td>
<td>6.07</td>
</tr>
<tr>
<td>Quartzite</td>
<td>12</td>
<td>2.60</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>462</td>
<td>99.99</td>
</tr>
</tbody>
</table>
Table showing site-wise and type-wise distribution of artifacts of blade industry.

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Types</th>
<th>Sites on Claru</th>
<th>MADDIGODA</th>
<th>MADIERU</th>
<th>DONIGODA</th>
<th>TOTAL</th>
<th>PERCENTAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>MTP</td>
<td>UPP</td>
<td>YLR</td>
<td>MRR</td>
<td>SPKL</td>
<td>NMP</td>
</tr>
<tr>
<td>1</td>
<td>Backed pieces</td>
<td>7</td>
<td>34</td>
<td>12</td>
<td>1</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>2</td>
<td>Scrapers</td>
<td>1</td>
<td>8</td>
<td>4</td>
<td>-</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>3</td>
<td>Points</td>
<td>3</td>
<td>24</td>
<td>3</td>
<td>-</td>
<td>5</td>
<td>-</td>
</tr>
<tr>
<td>4</td>
<td>Borers</td>
<td>-</td>
<td>1</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>5</td>
<td>Aula</td>
<td>-</td>
<td>4</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>6</td>
<td>Burins</td>
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<td>1</td>
<td>-</td>
<td>1</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>7</td>
<td>Lunates</td>
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<td>1</td>
<td>-</td>
<td>2</td>
<td>-</td>
</tr>
<tr>
<td>8</td>
<td>Triangles</td>
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<td>4</td>
<td>1</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
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<td>9</td>
<td>Trapezes</td>
<td>-</td>
<td>2</td>
<td>-</td>
<td>1</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>10</td>
<td>Blades</td>
<td>7</td>
<td>63</td>
<td>16</td>
<td>3</td>
<td>7</td>
<td>5</td>
</tr>
<tr>
<td>11</td>
<td>Flakes</td>
<td>6</td>
<td>10</td>
<td>6</td>
<td>2</td>
<td>6</td>
<td>2</td>
</tr>
<tr>
<td>12</td>
<td>Cores</td>
<td>13</td>
<td>50</td>
<td>21</td>
<td>2</td>
<td>8</td>
<td>-</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td>38</td>
<td>221</td>
<td>66</td>
<td>8</td>
<td>31</td>
<td>2</td>
</tr>
</tbody>
</table>
Tool Types

There is a total of 462 artifacts in the collection. The finished tools represent 194 (42%) specimens and the other categories such as flakes, blades and cores excluding the byproduct debitage constitute 268 (58%) specimens. The distribution of finished tool types is as follows:

<table>
<thead>
<tr>
<th>Types</th>
<th>Nos.</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Backed pieces</td>
<td>63</td>
<td>32.47</td>
</tr>
<tr>
<td>2. Scrapers</td>
<td>22</td>
<td>11.34</td>
</tr>
<tr>
<td>3. Points</td>
<td>39</td>
<td>20.10</td>
</tr>
<tr>
<td>4. Borers</td>
<td>3</td>
<td>1.55</td>
</tr>
<tr>
<td>5. Awls</td>
<td>4</td>
<td>2.06</td>
</tr>
<tr>
<td>6. Burins</td>
<td>2</td>
<td>1.03</td>
</tr>
<tr>
<td>7. Lunates</td>
<td>25</td>
<td>12.88</td>
</tr>
<tr>
<td>8. Triangles</td>
<td>5</td>
<td>2.58</td>
</tr>
<tr>
<td>9. Trapezes</td>
<td>3</td>
<td>1.55</td>
</tr>
<tr>
<td>10. Retouched blades</td>
<td>12</td>
<td>6.19</td>
</tr>
<tr>
<td>11. Retouched flakes</td>
<td>16</td>
<td>8.25</td>
</tr>
<tr>
<td><strong>Total:</strong></td>
<td><strong>194</strong></td>
<td><strong>100.00</strong></td>
</tr>
</tbody>
</table>

The artifacts which possess secondary trimming or deliberate retouch on any of the margins are grouped under the category of finished tools. The other categories, which are devoid of secondary working, are dealt separately.
Among the finished tool-types, backed pieces constitute a substantial number. They are invariably made on blades or blade sections and show triangular, trapezoidal or sector like cross section. Backed pieces prepared on blades are 37 in number whereas those on blade sections are 26. These can be mainly divided into two categories based on the nature of backing as:

1. Natural back or plain back — 44
2. Blunted back or worked back — 19

Total — 63

In the former type cortex is taken advantage of as providing natural back and retained; but sometimes its removal by a longitudinal flake down the entire margin also provided a useful back. The worked back specimens show steep blunting on the thicker margins by bold retouch. All of them show in general one thick side backed by retouch and the opposite margin sharp.

The distribution of backed pieces based on the side profiles is given in the next page.
The backed blades possess flat ventral surfaces and partly or fully worked dorsal surfaces. Basing on the ridges on the dorsal surface they can be divided in the following manner:

### Ridge Pattern

<table>
<thead>
<tr>
<th>Pattern</th>
<th>Nos.</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Single</td>
<td>35</td>
<td>55.56</td>
</tr>
<tr>
<td>Double</td>
<td>5</td>
<td>7.93</td>
</tr>
<tr>
<td>Cortical</td>
<td>8</td>
<td>12.70</td>
</tr>
<tr>
<td>Irregular</td>
<td>3</td>
<td>4.76</td>
</tr>
<tr>
<td>Non-ridged</td>
<td>12</td>
<td>19.05</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>63</strong></td>
<td><strong>100.00</strong></td>
</tr>
</tbody>
</table>

The above two analyses indicate that the majority of the backed pieces have a straight and straight sided profile and single ridge. The sharper edges of the backed pieces show either
retouch or use-marks as following:

Opposite margin retouched  10
Opposite margin used        53
                                —
Total :              63

The description of illustrated specimens

YLM - 81 (Fig. 29, No. 2)

Long narrow slender blade with plain back at the right margin by removing a long narrow flake, the cutting edge is straight with use-marks, two ridges following the longer axis, fine grained-Quartzite, Fresh. (3.8 x 0.9 x 0.4 cm)

UPP - 36 (Fig. 29, No. 3)

Backed piece on a narrow thick blade. Left lateral margin convex, is blunted by bold retouch. Opposite margin shows secondary working from dorsal side near the proximal end, Chalcedony, Fresh. (3.4 x 1.2 x 0.7 cm)

UPP - 56 (Fig. 29, No. 4)

Broad and thin specimen of back-blunted blade. The cutting edge shows retouched marks, proximal and is broken, prominent central ridge-Chert, Fresh. (3.1 x 1.3 x 0.6 cm)

UPP - 85 (Fig. 29, No. 5)

Backed piece on a broken, thin, slender blade, right lateral margin blunted by minute retouch.
Opposite margin shows use marks. Broken on either end-chart, Fresh. (2.0 x 1.5 x 0.8 cm)

UPP - 86 (Fig. 29, No. 8)

Backed piece on a small thin narrow blade, left lateral margin with continuous bold retouch. Opposite margin with use-marks-Chart, Fresh... (2.4 x 1.1 x 0.3 cm)

MTP - 44 (Fig. 29, No. 9)

Backed piece on a small blade. Right lateral margin blunted by bold retouch, followed by minute retouch. Retouch is done from both the surfaces. Opposite margin shows use-marks-Carnelian, Fresh. (3.0 x 1.2 x 0.6 cm)

LKU - 83 (Fig. 29, No. 10)

Backed piece on a broad broken blade, straight and straight, irregular ridged, left lateral margin thick and blunted by bold retouch. Opposite margin shows minute retouch. Ventral surface has a prominent bulb-Chart, Fresh. (2.2 x 1.7 x 0.9 cm)

UPP - 37 (Fig. 29, No. 11)

Excellent back blunted blade on thin narrow slender blade. Retouch is continuous on cutting edge, dorsal surface ridged while ventral retains the remnants of blunting on the left lateral margin-chalcedony, Fresh. (2.8 x 1.2 x 0.3 cm)
Scrapers

This type is represented by 22 specimens and comes third in the categories of the finished tools. These are made on cores (11), blades (6) and flakes (5) respectively. The scraping edge is obtained by finer retouch than noticed on the Upper Palaeolithic specimens of the type. It was done either from dorsal or ventral sides and rarely from both sides. Based on the working affected to the margins they are divided into the following sub-types as:

1. Side scrapers 2
2. End scrapers 2
3. Double edged side scrapers 2
4. Side-cum-end scrapers 3
5. Double ended 1
6. Core scrapers 11
7. Scraper-cum-borer 1

Total: 22

Side Scrapers

There are altogether 2 specimens of this category. One is made on flake and the other on a blade. The scraping edge is created on one of the lateral margins by bold retouch from dorsal surface. (Not illustrated)
End Scrapers

This category is represented by two specimens of which one is made on a blade and the other on a flake. The scraping edge is created on the distal end opposite to bulb end. (Not illustrated)

Double edged side scrapers

There are two specimens of this category which are made on a thick blade and a flake. Both the lateral margins of the specimens are retouched by bold steep secondary working from dorsal side on one of the margins and from ventral side on the opposite margin.

LBRT - 43 (Fig. 30, No. 14)

Double edged side scraper on a thick leaf shape flake, both the lateral margins show bold steep working from the ventral side—Chert, Fresh. (3.00 x 2.00 x 0.7 cm)

Side-cum-end scrapers

There are altogether 3 specimens of this category. They are made on thick blade sections and have one side margins and the distal end deliberately worked by steep bold retouch.
LORT - 45 (Fig. 30, No. 18)

Side-cum-end scraper on a broad blade, left lateral margin and the distal end show scraping edge obtained by steep bold working. Carnelian, Fresh. (2.6 x 1.6 x 0.4 cm)

LKV - 82 (Fig. 30, No. 13)

Double edged-cum-end scraper on a broken thick and broad blade. Scarping edges are obtained on right lateral margin and at the distal end by steep bold retouch from the dorsal side, while on the left lateral margin from the ventral side. It is double ridged on dorsal surface and plain on ventral surface - Chert, Fresh. (1.9 x 2.4 x 1.1 cm)

Double ended scraper

This category is represented by a single specimen, made on a thick broken core flake. It retains cortex on dorsal surface and fully flaked ventral surface. Both the distal and proximal ends are retouched from ventral side only. (Not illustrated)

Core scrapers

This category has a majority in the scraper group. Scraping edge is restricted to a part of the periphery only. Except two specimens, all retain patches of pebble cortex. Working edge is obtained by steep bold retouch from one of the surfaces.
UPP - 9 (Fig. 30, No. 20)

Core scraper of roughly circular plan, scraping edge is obtained on a part of the periphery by steep working from dorsal side. Partly worked dorsal and ventral surfaces. Chart, Fresh.

Scrapers-cum-borer

One specimen made on a thick blade is present in this category. On one of the margins scraping edge is created by bold retouch and the borer tip is there at the distal end. (Not illustrated)

Points

This category represented by 39 specimens is the second largest group. The tools can be broadly divided into two, as simple points and tanged points basing on the absence of presence of a tange at the proximal end.

Simple points 39
Tanged points 1
Total 39

Points were made on blades and the pointed end always lies at the distal end.

Simple points are sub-divided into three categories basing on the shape (outline) in relation to the central axis.
1. Symmetric points 4
2. Asymmetric points 10
3. Crescentic points 24
Total: 38

Symmetric points

This category is represented by 4 specimens. They are all made on blades and show symmetric outline and are leaf shaped or triangular. Secondary working is observed all along the periphery except at the bulbar end, and the lateral margins converge to a point at the distal end. The secondary working is always minute.

The description of illustrated specimens.

UPP - 54 (Fig. 31, No. 25)

Symmetric point on a blade with retouched left lateral margin. Right margin shows use-marks. Well developed central ridge on dorsal surface. Fully flaked ventral surface, agate, fresh. (3.0 x 1.3 x 0.5 cm)

Asymmetric points

There are 10 specimens in this group all made on blades. They are asymmetric in outline, and the secondary working is confined to the upper parts of
the lateral margins of the specimens, invariably at the distal end. A few of them bear retouch all along the periphery by minute working. The description of illustrated specimen is as follows:

**YLM - 106 (Fig. 31, No. 30)**

Asymmetric point on a thin blade with retouched right lateral margin. Distal end pointed. Fine grained-Quartzite, Fresh. (2.0 x 1.4 x 0.3)

**Crescentic points**

This is the largest represented category among the points and the tools are made on blades only. The side of the arc is blunted by steep bold retouch from dorsal side followed by minute retouch.

Whereas chord side generally shows use-marks. There are two specimens bearing a small tang, which is obtained by the removal of a single flake or a few minute flakes at the proximal end.

Description of the illustrated specimens:

**LKV - 91 (Fig. 32, No. 33)**

Excellent crescentic point with well blunted arc, and straight chord with use-marks, carnelian, Fresh. (3.1 x 0.9 x 0.6 cm)
UPP - 97 (Fig. 32, No. 34)
Crescentic point with well blunted arc,  
Chord shows use-marks - Agate, Fresh. (2.7 x 1.0 x 0.9 cm)

VLA - 105 (Fig. 32, No. 35)
Crescentic point on a broad blade, arc blunted,  
chord straight the latter showing minute retouch all along - Chert, Fresh (2.9 x 1.2 x 0.5 cm)

UPP - 90 (Fig. 32, No. 36)
Excellent crescentic point on a long slender blade. Both arc and chord are neatly worked. The distal end shows sharp point. Proximal end is elongated by deliberate working so as to appear as a tang - Carnelian, Fresh. (3.0 x 1.2 x 0.8 cm)

UPP - 81 (Fig. 32, No. 37)
Beautiful crescentic point on a long slender blade with convex back which is blunted on the extremities. The chord is straight and has use-marks. The distal end is pointed, and the proximal end is elongated and retouched so as to appear as a tang - Chalcedony, Fresh. (2.8 x 1.0 x 0.3 cm)

Tanged points

This category is represented by a single specimen in which a tang is obtained at the proximal end on the
left lateral margin. So it is categorised as single shoulder point. It has a leaf shaped outline with both the margins fully worked by minute retouch converging to a point at the distal end.

YLM - 108 (Fig. 31, No. 26)

A good single shouldered point on a leaf shaped flake with deliberate retouch on both the margins. Shoulder is created by removing a flake along left lateral margin at the proximal end. Single prominent ridge on the fully flaked dorsal surface. Traces of bulb on ventral surface. Crystal, Fresh. (2.2 x 1.4 x 0.6 cm)

Borers

This category is represented by 3 specimens, all made on blade sections. The borer tip is prepared at the distal end by deliberate secondary working from the dorsal side. Both the lateral margins show excellent retouch to obtain a pointed tip.

UPP - 99 (Fig. 31, No. 31)

Borer on a blade, half broken. Both the lateral margins show bold working, converge to a point at the distal end. Flat ventral surface. Chert, Fresh. (2.1 x 1.4 x 0.8 cm)
Auls:

This category is represented by 4 specimens all made on blades only. The aul point always lies at the distal end. It is obtained by minute working on both the lateral margins at the distal end so as to make an aul point. The retouch is confined to the distal portion only.

UPP - 100 (Fig. 31, No. 27)

Aul on a thin slender blade with converging lateral margins. Left lateral margin made thin by removing a flake, while the right lateral margin shows retouch, so as to obtain aul point—Chert, Fresh. (2.6 x 1.0 x 0.7 cm)

Burins

There are altogether two specimens in this category and both are of the single blow type. They are all made on blades and the functional end is always at the distal end. A single vertical spall is removed on one of the margins to obtain the burin end.

UPP - 56 (Fig. 30, No. 15)

Single blow burin on a small thick blade. Burin spall is removed from right lateral margin at the distal end—Carnelian, Fresh. (2.00 x 0.9 x 0.3 cm)
Lunates

This category is represented by 25 specimens. All of them are prepared on blades only. Many are very thin and slender but a few are thicker and broader. The arc is well blunted by minute working and the chord shows signs of use-marks. The chord is invariably straight and rarely concave. Based on their outline in relation to central axis, they are subdivided into:

Asymmetric lunates 10
Symmetric lunates 15
Total 25

The following is the description of the illustrated specimens.

LKV - 94 (Fig. 33, No. 46)

An excellent lunate on a thin narrow slender blade. Arc is well blunted. Dorsal surface shows mid-ridge with ends running into the arc. Chord is straight and shows use-marks, agate, Fresh. (3.2 x 0.6 x 0.3 cm)

UPP - 76 (Fig. 33, No. 46)

A symmetric lunate on a thin slender blade, with arc well blunted by steep working. The chord is straight with use-marks-Carnelian, Fresh. (2.9 x 1.1 x 0.5 cm)
UPP - 90 (Fig. 33, No. 50)

Asymmetric lunate on a thick blade, thick blunted arc, mid ridge runs parallel to the chord.
Chord shows use-marks-Chalcedony, Fresh.
(2.6 x 1.3 x 0.6 cm)

Triangles

There are altogether 5 specimens in this category, all are made on broad and short blades.
Two of the sides are blunted by minute retouch and the other shows use-marks. They are subdivided
into scalene and isosceles. The specimens usually show poorly developed mid ridges on dorsal surface.
The following is the description of the illustrated specimens.

UPP - 75 (Fig. 33, No. 44)

A scalene triangle on a thin blade. Arc is thick and well blunted by step working, ill developed
ridge on dorsal side-Chalcedony, Fresh.
(2.6 x 1.1 x 0.5 cm)

UPP - 91 (Fig. 33, No. 43)

An equilateral triangle on a blade, minute secondary working on two sides, mid ridge runs almost parallel
to the working edge which is straight and shows use-marks-Chart, Fresh. (2.6 x 1.6 x 0.4 cm)
Trapezes

This category is represented by 3 specimens which are fashioned out of blades. The shape of the specimen is trapezium, and shows midridge on dorsal surface. Three of the sides show blunting and the other shows signs of usage. The description of the illustrated specimens is as follows.

UPP - 85 (Fig.33, No.51)

Equilateral trapeze on a blade. Three of the sides are thick and well blunted by minute steep working. The fourth one also shows retouch. Dorsal surface has single mid ridge-Chert, Fresh. (2.6 x 1.2 x 0.4 cm)

Other categories

These consist of mainly flakes and blades including retouched ones and cores. They are described below one after another.

Blades

They are altogether 116 in number. Under this category are grouped all those flakes whose length, breadth ratio is more or less 2:1 and the edges parallel. They are broadly divided into three categories based on signs of retouch, use-marks and no marks (fresh). as
Retouched blades  12  10.34
Used blades  76  65.51
Simple blades  28  24.13
Total  116  99.99

The blade category includes full length blades (40) as well as broken ones (76). All of them show sharp lateral margins though they are thick in the middle (ridge portion). The side profiles of the blades are as follows:

<table>
<thead>
<tr>
<th>Side Profile</th>
<th>No.</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Straight &amp; Straight</td>
<td>74</td>
<td>63.78</td>
</tr>
<tr>
<td>Straight &amp; Tapering</td>
<td>8</td>
<td>6.90</td>
</tr>
<tr>
<td>Straight &amp; Irregular</td>
<td>4</td>
<td>3.45</td>
</tr>
<tr>
<td>Convex &amp; Straight</td>
<td>12</td>
<td>10.35</td>
</tr>
<tr>
<td>Convex &amp; Tapering</td>
<td>6</td>
<td>5.17</td>
</tr>
<tr>
<td>Convex &amp; Concave</td>
<td>4</td>
<td>3.45</td>
</tr>
<tr>
<td>Tapering &amp; Tapering</td>
<td>8</td>
<td>6.90</td>
</tr>
<tr>
<td>Total</td>
<td>116</td>
<td>100.00</td>
</tr>
</tbody>
</table>

The blades possess plain ventral surface and fully or rarely partly flaked dorsal surface. The ridge pattern of the dorsal surface is as follows:

<table>
<thead>
<tr>
<th>Ridge Pattern</th>
<th>No.</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Single</td>
<td>60</td>
<td>51.72</td>
</tr>
<tr>
<td>Double</td>
<td>16</td>
<td>13.79</td>
</tr>
<tr>
<td>Triple</td>
<td>5</td>
<td>4.31</td>
</tr>
</tbody>
</table>
The above two analyses indicate that the majority of the blades consist of straight and straight sided profiles with single ridge on dorsal surface. The edges of the blades are generally sharp with or without retouch or use-marks.

The maximum size of the blade measures 3.7 x 1.6 x 1.0 cm, while the minimum measures 1.3 x 0.9 x 0.4 cm.

The following table shows the length frequency of full length blades.

<table>
<thead>
<tr>
<th>Length class (Cm.)</th>
<th>Nos.</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.1 - 1.5</td>
<td>1</td>
<td>2.50</td>
</tr>
<tr>
<td>1.6 - 2.0</td>
<td>13</td>
<td>32.49</td>
</tr>
<tr>
<td>2.1 - 2.5</td>
<td>4</td>
<td>10.00</td>
</tr>
<tr>
<td>2.6 - 3.0</td>
<td>13</td>
<td>32.49</td>
</tr>
<tr>
<td>3.1 - 3.5</td>
<td>7</td>
<td>17.50</td>
</tr>
<tr>
<td>3.6 - 4.0</td>
<td>2</td>
<td>5.00</td>
</tr>
<tr>
<td>Total</td>
<td>40</td>
<td>99.98</td>
</tr>
</tbody>
</table>
Table showing width frequency

<table>
<thead>
<tr>
<th>Width class (Cm.)</th>
<th>Nos.</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.5 - 0.7</td>
<td>1</td>
<td>2.50</td>
</tr>
<tr>
<td>0.8 - 1.0</td>
<td>9</td>
<td>22.50</td>
</tr>
<tr>
<td>1.1 - 1.3</td>
<td>11</td>
<td>27.50</td>
</tr>
<tr>
<td>1.4 - 1.6</td>
<td>8</td>
<td>20.00</td>
</tr>
<tr>
<td>1.7 - 1.9</td>
<td>9</td>
<td>22.50</td>
</tr>
<tr>
<td>2.0 - 2.2</td>
<td>1</td>
<td>2.50</td>
</tr>
<tr>
<td>2.3 - 2.5</td>
<td>1</td>
<td>2.50</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>40</strong></td>
<td><strong>100.00</strong></td>
</tr>
</tbody>
</table>

Table showing thickness frequency

<table>
<thead>
<tr>
<th>Thickness (Cm.)</th>
<th>Nos.</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.1 - 0.2</td>
<td>5</td>
<td>12.50</td>
</tr>
<tr>
<td>0.3 - 0.4</td>
<td>12</td>
<td>30.00</td>
</tr>
<tr>
<td>0.5 - 0.6</td>
<td>7</td>
<td>17.50</td>
</tr>
<tr>
<td>0.7 - 0.9</td>
<td>11</td>
<td>27.50</td>
</tr>
<tr>
<td>0.9 - 1.0</td>
<td>5</td>
<td>12.50</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>40</strong></td>
<td><strong>100.00</strong></td>
</tr>
</tbody>
</table>

The table shows that 82% of the length values are confined to 3 successive class intervals, 1.6-2.0 cm., 2.6-3.0 cm., and 3.1-3.5 cm.

Whereas 92% of the breadth values are confined to 0.8-1.0 cm., 1.1-1.3 and 1.7-1.9 cm., and 50% of the thickness values confine to 0.3-0.4 cm. and 0.7-0.8 cm.
The description of illustrated specimens follows:

UPP - 47 (Fig. 30, No. 19)

Roughly parallel sided thin broad blade. A small cortical patch at the distal end. A prominent ridge flanked by shallow and deep flake scars on the dorsal surface. Prominent bulb and ripple marks on the ventral surface. Use-marks are observed on both the margins—Chalcedony, Fresh. (2.8 x 1.3 x 0.6 cm)

UPP - 82 (Fig. 30, No. 22)

Parallel sided thick broken blade. Prominent forked ridge on the dorsal surface. Ripple marks and bulbar scar on the ventral surface. A part of the right margin is trimmed and the opposite margin shows use-marks—Agate, Fresh (3.5 x 1.4 x 0.7 cm)

LKV - 65 (Fig. 30, No. 23)

Parallel sided blade, with double ridged, fully flaked dorsal surface except a small cortical patch at the distal end. Ventral surface is with a prominent bulb. Use-marks are present on either margin—Carnelian, Fresh. (3.0 x 1.2 x 0.6 cm)

LKV - 24 (Fig. 33, No. 45)

A small thin blade with triple ridged dorsal surface. Main flake surface and a bulbar scar on ventral surface. Use-marks on either margin—Agate, Fresh. (2.6 x 0.9 x 0.4 cm)

LKV - 54.

A narrow thick serrated broken blade. Excellent
retouch on the both margins from both the sides. Prominent mid ridge, a few deep and shallow flake scars on the dorsal surface—Carmelian, Fresh. (not illustrated) (2.0 x 0.8 x 0.4 cm)

Flakes

There are altogether 46 specimens of this category. Under this category are grouped those specimens whose lengths are less than twice their widths and the lateral margins may or may not be essentially parallel. The thickness and the ridge pattern vary much among the flakes. The usual shapes found are triangular, roughly triangular, quadrangular, rectangular, oval, pointed and irregular. They possess plain ventral surface and fully or partly flaked dorsal surface. Platforms are usually faceted. They can be divided into three groups based on the signs of retouch, use-marks or without either the one as

<table>
<thead>
<tr>
<th>Type</th>
<th>Quantity</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Retouched</td>
<td>16</td>
<td>34.78</td>
</tr>
<tr>
<td>Used</td>
<td>20</td>
<td>43.47</td>
</tr>
<tr>
<td>Simple</td>
<td>10</td>
<td>21.73</td>
</tr>
<tr>
<td>Total</td>
<td>46</td>
<td>100.00</td>
</tr>
</tbody>
</table>

Cores

This category is represented by 134 specimens and can be broadly classified into two categories as
Fluted Cores

This category is represented by the maximum number of specimens among the cores. They are cylindrical, tabular, and prismatic in shape. Generally blades are removed from these cores, in two directions from both the ends and sometimes in one direction only from one of the ends. Most of the cores reveal that they were partially worked (used) and occasionally completely worked until the core is exhausted. Distinctive prepared striking platforms are seen on most of the cores. Sometimes the flat surface of the body is used as striking platform. These cores show excellent parallel sided flutations on the surface of their bodies.

LKV - 20 (Fig. 32, No. 38)

Cylindrical core with parallel sided flutations on a part the body and rest retaining cortex, prepared striking platform, Chert, Fresh (3.1 x 2.6 x 2.3 cm)

YLM-35 (Fig. 32, No. 40)

Cylindrical core having excellent parallel sided flutations, a patch of cortex on part of the body, prepared striking platform, Chert, Fresh. (3.4 x 2.8 x 1.8 cm).
SPKL - 19 (Fig.34, No.53)

Cylindrical core with parallel sided notations, prepared striking platform-Fine grained Quartzite, Fresh. (2.3 x 1.9 x 1.3 cm)

UPP - 83 (Fig.34, No.54)

Conical fluted core with excellent blades-scars, two prepared striking platforms-Chart, Fresh. (2.8 x 2.0 x 1.3 cm)

UPP - 124 (Fig.34, No.55 & 56)

Pyramidal core, parallel sided notations around the body, prepared striking platform-Chart, Fresh. (3.4 x 2.8 x 2.0 cm)

Amorphous cores

This category is represented by 47 specimens. They are non-descriptive in shape and exhibit long and short bodies. Flakes were removed on these in all possible directions. They show prepared striking platforms and occasionally the flat surfaces of the core used as platforms. These cores seem to have been utilised for the removal of flakes as well as blades since both irregular and parallel sided flake scars are observed on the same cores.
Ceramic Industry

This study is based on surface collection of 120 sherds (88 sherds + 32 rims) from 6 sites. The site wise distribution of the pottery is given in the below table.

<table>
<thead>
<tr>
<th>Sites</th>
<th>No. of sherds</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Uppalapadu</td>
<td>37</td>
<td>30.83</td>
</tr>
<tr>
<td>Lakkavaram</td>
<td>1</td>
<td>0.83</td>
</tr>
<tr>
<td>Yellavaram</td>
<td>34</td>
<td>28.33</td>
</tr>
<tr>
<td>Matlapadu</td>
<td>20</td>
<td>16.67</td>
</tr>
<tr>
<td>Nimmalapalem</td>
<td>18</td>
<td>15.00</td>
</tr>
<tr>
<td>Senapathi Pakala</td>
<td>10</td>
<td>0.33</td>
</tr>
<tr>
<td>Total</td>
<td>120</td>
<td>100.00</td>
</tr>
</tbody>
</table>

These sites have yielded both chipped stone and ground stone tools alongside pottery. Except at Nimmalapalem the other sites are associated with either ground stone tools or perforated stones. The sites Uppalapadu and Yellavaram which yielded the highest proportion of potsherds are also rich in artifacts of ground stone, and chipped stone tools.

On the basis of surface colour and texture the pottery has been classified into two main wares—coarse gritty red ware and grey ware. The former comprises
of 113 (94.17%) sherds and occurs commonly at all sites and the latter are of 7 sherds (5.83%) represented in two sites as a stray find.

Regarding the technique of manufacture of gritty red ware, it is difficult to make out whether the sherds were hand modelled, made on wheel or turn table. But some of the sherds with relatively thin sections and even surfaces suggest the usage of slow wheel or turn table. As regards the grey ware it is very clear that they were hand made exhibiting finger impression on the body with uneven surfaces.

Coarse gritty red ware

This ware is distinguished by its coarseness which is the result of poor clay intermixed with sand and silt particles. The internal surface is fairly even, though sand particles are seen in the core. It is ordinary well fired but some sherds show pale grey coloured core. The thickness of the sherds range from 1.4 to 0.8 cm. Regarding the surface treatment of this ware since the sherds are deeply corroded, it is difficult to say anything definite. However thick reddish brown slip occurs as patches on the rims of the sherds.

In the total collection rims are 29 in Number (25.66%) and sherds 84 (74.33%). Since the sherds are very fragmentary except a few it is difficult to visualise full forms. The frequently represented form however,
appears to be a globular vessel with angular neck and sharply flared rim. The other form is represented by a wide mouthed deep bowl with featureless rim. This form occurs only at Uppalapadu and Yellavaram where more number of pot sherds were collected than at others. Decoration is not noticed on any of the sherds.

Fig. 37 No. T₁-T VI

Type I. Fragment of a medium sized vase with short neck and flared rim.

Type II. Fragment of a slightly convex sided wide mouthed bowl with thick featureless rim.

Type III. Fragment of a bowl with slightly tapering profile and nail headed rim.

Grey Ware

This ware is not so coarse as red ware. Moderately sorted clay was used for the preparation of this ware. Sections are compact and of medium thickness. It is hand modelled and well fired. On the basis of surface treatment it is divided into two varieties.

1. Slipped and unburnished variety. 2. Burnished variety.

In the total collection one is of burnished variety and the rest six are of slipped and unburnished
variety. No decoration is observed on this ware. The main pot forms represented in the slipped and unburnished variety are straight sided wide mouthed bowl with bevelled rim (type V) and a narrow tubular necked vessel (type IV).

The only form marked in the burned variety is a lipped bowl.

Type IV. Fragment of a narrow tubular necked vessel.
Type V. Fragment of a medium sized straight sided wide mouthed bowl with bevelled rim.
Type VI. Fragment of a lipped bowl with featureless rim.

The more quantity of pottery occurs from coarse gritty red ware from all the sites except Lakkesavaram. As already mentioned above the slip and burnishing could not be noticed apparently since the sherds are highly corroded. The grey ware also shows unburnished variety, on the other hand no decoration is observed on the wares. So it can be inferred that the tendency and interest of Neolithic man towards the usage of pottery is simply utilitarian.

Here the globular body vases occur only in the coarse red ware besides wide mouthed bowls, unlike grey ware where only bowls are represented. So bowls
occur in both the wares but no globular body vase is reported in grey ware. But the grey ware makes its significance by the presence of tubular necked vessel and a lipped bowl. Hence the red ware may have been utilized as earthen wares and storage purposes whereas the bowls could have served for drinking and eating in day to day life.

Summary

In Eleru valley eight Neolithic sites have been located with varied artifactual content. The important type site is Uppalapadu on the right bank of the Eleru and the other sites are located not far away. All are open air Primary sites without a considerable habitation deposit at any of them. In general these Neolithic sites are situated at the foot of hills and on granitoid tops but always near to the water courses. These sites are identified by means of a few pecked and ground stone tools, sizeable quantity of blades and a few potsherds. The absence of regular habitation deposit suggests that these might be camping places.

The pecked and ground stone tools are fashioned out of charnockites, khondalites and sandstones which readily occur as out crops, while for stone blade industry crypto-crystalline silica such as chert, chalcedony, agate etc., are available in the form of water-worn pebbles.
The pecked and ground stone industry consists of adzes, small celts and a single rounded butt axe. In general the artifacts exhibit two stages of preparation. 1. Pecked and ground and 2. fully ground. Irrespective of tool types the dimensions of the tools range between 3.4 x 3.2 x 1.2 cm. to 7.4 x 3.8 x 2.0 cm. There are a total of 15 ground-stone specimens. Out of these adzes are 9, celts 5 and rounded butt axe one. Adze is the more common tool type in this assemblage. Besides these, there are a few perforated stones in circular and rectangular shapes, probably used as net sinkers or weights for digging sticks. The perforations are of the hour-glass type indicating that they were bored from both sides.

The next part of the neolithic culture is the blade industry which is abundantly represented. The blade industry is based on crypto-crystalline silica. Various tool types are present in the industry. The chaif tool type of the industry is backed blade. The next tool type is point which shows a variety such as asymmetric, symmetric and crescentic points, among them the last one is dominating. The other tool types are scrapers, borers, awls and burins, the last one being feably represented. Geometric tool types such as Lunates, Trapezes and triangles are also present. Unlike in the Neolithic blade industries of South
India, in the present industry the crested-guide ridge technique is absent. Typo-technologically this industry bears close affinity to that of the Mesolithic assemblage in the area but for a few differences. The sizes of the blades and fluted cores are larger here than their counterparts in the Mesolithic assemblage. This development may be however, explained away by attributing it to such factors as the procurement of raw material in the form of large pebbles, the general increase of the standard of craftsmanship and the arrival of new needs like crop-harvesting.

The third element of Neolithic culture is ceramic industry. This assemblage is mainly Neolithic in character though there is a small quantity of late pottery such as Megalithic and Early Historic. The late pottery is however, excluded from the present study. The Neolithic pottery represented here is hand made and occasionally made on wheel. It is main and without any sort of decoration. The ceramic industry consists of red and grey wares. A detailed study of forms and types indicates that the red ware was used to make vessels for cooking and storage purposes. There are bulbous or globular bodied vases in this ware whereas the grey ware is represented by bowls, which could have served for drinking and eating.
FIG 36