CHAPTER IV

ANALYSIS OF ARCHAEOLOGICAL DATA

In this chapter is given an analysis of the archaelo-
gical data including discussions on the raw material used
and the lithic technology employed for manufacturing the
stone tools, as well as a systematic classification of the
stone tools of Tripura.

I. RAW MATERIAL

It is remarkable that the stone industry of Tripura is
wholly based on silicified fossil wood which occurs in the
Tipam Sand Rock Formation and exposed in the Baramura hill
flanks. In rare cases, a few pieces of quartzite pebbles
and vein quartz are found in association with the tools.
In Sonal Bazar (Quarry) site, a bulk of siltstone pieces
occur along with the tools. However, no stone tool made on
rock other than fossil wood has so far been found in Tripura.
It has to be mentioned here that no true hard rock is avail-
able in Tripura. The siltstone and sandstone extensively
found locally, are soft and friable and for this reason
are unsuitable for making tools. Therefore, the prehistoric
man of Tripura solely depended on the fossil wood material
of suitable types.

The fossil wood of Tripura is of a fine quality, because
of their high rate of silicification, some specimens of fossil
wood have assumed the character of flint or chert and for this reason it was possible to use them for detaching fine flakes and blades.

In general, the artifacts do not show much patination. Most of the tools are in fresh condition. They do not show any evidence of rolling, which reveals that the tools do not come from secondary river deposits. The wood structure is clear in majority of the implements. Most of the implements are flaked along the grain of the material, except in case of the fine grained variety. Controlled flaking is very difficult except along the plane transverse to the growth-rings of the tree. This basic nature of the raw material is of vital importance as it has controlled the typology of the fossil wood implements, most of which are made on tabular fragments from logs of silicified wood embedded in the Tipam Formation.

It may be pertinent to mention here that fossil wood in addition to silicified tuff, have been extensively employed by the Palaeolithic (Anyathian) man in Burma. Mr. William C. Darrah of the Laboratory of Palaeobotany, Harvard Botanic Museum, who has studied the fossil woods from Burma point out that these woods mainly belonged to *Dipterocarpoxylon*
burmese and Palmoxyron. He also states that there is a consistent relationship between degree of petrification and the suitability for flaking; the more complete the degree of mineralisation the more likely the specimen would be selected for use by man. This holds good for Tripura also. The palm (monocots) woods are much better and more easily worked than are the dycotyledon woods (cited from Movius 1943:350).

Mr. William C. Darrah has made two important observations that 1) "the fossil palm wood, owing to the peculiarities of its mode of growth, can be worked in any manner, 2) the dycotyledonous wood on the other hand can only be worked satisfactorily across the grain, if the conditions of preservation are all good".

The above observations are tenable for our Tripura also as this area lies in the western periphery of the same fold mountain ranges (Indo-Burman Ranges) extending from Burma to Tripura and having the same geographic and climatic setting and supporting the growth of Dipterocarpaceae and other fossil woods referable to Mesua, Gluta, Cynometron and Callophyllum (Prasad 1973, cited from Jaswal 1976: 58).

Mrs. M.E. Goodman of Radcliffe College, tested the raw materials namely, flint, silicified tuff and fossil wood for
density, hardness, resiliency and toughness using a piece of East Anglian (Brandon) flint as the "Standard", in order to throw some light on the workability and its possible influence on the typology. She found that fossil wood is intermediate between flint and silicified tuff in regard to density, hardness and toughness, but possesses maximum resiliency.

The origin of fossil wood is due to colloidal material associated with waters laying down the deposits in which it is preserved. The lithology of the Tipams in Tripura supports such an origin. Both mechanical and chemical weathering must have favoured the formation of the colloids, some of which seem to have been changed into crystalloidal forms later on. This evidence seems to point to the climate being a dry one in Tripura, which is also Dr. de Terra's opinion as far as the contiguous Burma is concerned (de Terra 1943: 285).

II. LITHIC TECHNOLOGY

A study of the entire artifactual material collected from Tripura, reveals that the following tool producing techniques existed in Prehistoric Tripura.
a) Heavy tool techniques

The heavy tools category in Tripura includes chopping-tools, handaxes, cleavers and handadzes. These have been produced by using a combination of heavy hammerstone technique and light hammerstone technique. This is evident from the big and deep flake scars as well as shallow and neat flake scars and secondary retouches (Fig.III, no.1). The primary flakings are seen as deep and elongated flake scars generally along the grain of the wood parallel to the longer axis of the tool (Pl.IV no.1, Fig.V no. 1 & 2) or centrally directed flakes (Pl.I no.2, Fig.I no.1) oblique to the grain of the raw material. Some of the tools (Pl. XIII no.2, Fig.V no.2) are fully and neatly flaked by deep and shallow flakes irrespective of the grain of the raw material.

b) Flake-tool techniques

In the flake-tool techniques, following types are observed:

(i) Free flaking techniques supported by free flake cores (Pl.IX) (Pl.V nos.1-8, Fig.VI nos.1-5)

(ii) Levalloisian technique, which is well developed as illustrated by Levalloisian core and flakes (Pl.V nos.1-8, Fig.VI nos.1-5)

(iii) Retouching of flake tools is evident to produce different varieties of scrapers, points and knives etc. (Pl.VII nos. 2 & 4, Fig.VIII nos.2 & 4, Pl. XII no.3 Fig.XI no.7 & 8)

c) Blade tool technique

Fluted core technique as supported by fluted or blade cores (Pl.XII no.5).
d) Microlithic techniques

i) The main characteristic of this technique is that it is dominated by micro-flakes and non-geometric forms (Pl.XII nos.6-13).

ii) Microlithic cores are rectangular or cubic in shape and show clear facets due to removal of blades (Pl.XII nos. 1 & 2).

e) Neolithic techniques

This technique is well illustrated by the following:

i) fully flaked or chipped (Pl.XV nos. 1 & 2)

ii) edge ground (Pl.XVIII nos. 2)

iii) pecked and edge ground (Pl.XVIII nos. 1,3,4)

iv) fully ground (Pl.XVIII no.7)

In association with implements of this group occur some grinding stones and potsherds, the former showing grinding facets (Pl.XVII nos. 1 & 2, Fig.XVII).

III POTTERY

The pottery has been found in two different contexts as under:

i) potsherds in small quantity occur along with ground and polished tools on T$_1$ terrace. These sherds consist of black and brown wares with coarse textures. The raw material used is impure coarse clay with mainly quartz grits as tempering material. The black ware shows cord impressed designs where-
as, the brown ware appear to be of plain type. They are crude and not well fired and appear to be hand-made. The size of the sherds is too small to give any idea about the size and type of vessels.

ii) A bulk of potsherds not associated with stone tools occur in stratified context along with the $T_3$ terrace deposit. The pottery found in these sites show dull white, brown and black colours and fine texture. It is thin and well fired suggesting an advanced technology. The material used is pure clay with quartz grains as tempering material. The pottery exhibits impressed (basket pattern) designs. The radiocarbon dating available for one site gave an age of $1,430 \pm 80$ yrs. B.P. for the peat occurring below the potsherd layer and therefore, the pottery has historical value. The bulk of the pottery material include potter's dabber, parts of mutka, lids, bowls, lamps and rims of fairly big pots.

IV TYPOLOGICAL CLASSIFICATION OF THE STONE TOOLS OF TRIPURA

A typological classification of the stone tools of Tripura is given below. Morphological characters and techniques of manufacture are taken as the main criteria for classification of the stone tool assemblages of Tripura into different types or standard forms.
A. HEAVY TOOL TYPES

The relative frequency of the heavy tool types is given below:

TABLE 23

<table>
<thead>
<tr>
<th>Types of tools</th>
<th>Frequency (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Handaxes</td>
<td>4 (16)</td>
</tr>
<tr>
<td>Handadzes</td>
<td>10 (40)</td>
</tr>
<tr>
<td>Chopping-tools</td>
<td>7 (28)</td>
</tr>
<tr>
<td>Cleavers</td>
<td>4 (16)</td>
</tr>
</tbody>
</table>

Total 25

1. Handaxes: (Pl.I nos. 1-3): These are roughly triangular to oval in shape and are made on chunks of fossil wood. The specimens are smaller in size compared to handaxes from other parts of India. The axes are of pointed type ranging in length from 8.3-11 cms, width 5-5.6cms and thickness 2-2.7cms. The axes show big and small flake scars on both the surfaces, the longitudinal flakes being longer (Pl.I no.2). The wood structure is clearly visible although the silicified material is very fine grained. Occasionally, cortex is preserved (Pl.I no.3). Evidence of patination or rolling is absent.

The Anyathian of Burma is reported to be significantly
devoid of handaxe and bifacial tools as also flakes and cores (Movius 1943:360,367). Movius argues that the fossil wood does not lend itself to the manufacture of handaxe (op.cit:370). However, the occurrence of well prepared handaxe on silicified wood in Tripura and in the Mainamati Range in Bangladesh, reported by Dani (Dani 1966: 71), is very significant. Movius further observes that the people responsible for Palaeolithic of Burma and China were not users of handaxes (op.cit:367-371).

2. Handadzes: (Pl.II nos.1-4, Fig.II nos. 1 & 2, Fig.III nos. 1 & 2): These are specialised tools of the Early Anyathian of Burma. These have also been found in Tripura and are found to be most numerous (40%) among the heavy tool assemblage of this area. They are essentially core tools, prepared on pebbles of fossil wood. They are divided into the following sub-types:

   a) Double steep-edged handadze (Pl. II no.1, Fig.III no.1). This is made on a longish pebble of fossil wood. The angle of the cutting edges are steep i.e. more than 45°. The specimen shows cortex except in the cutting edges and right lateral side. Wood structure is conspicuous.

   b) Single steep-edged handadze (Pl.II no.3). The specimen is made on a heavy pebble of fossil wood. The flaking is done in steps to produce a steep working edge which is at right angle to the long axis of the rectangular specimen. A major part of the specimen shows cortex.
c) Single-edge handadze (Pl.II no.2, Fig.II no.1). It is roughly oval in shape and shows flaking on the dorsal surface. The cutting edge is broad, V-shaped and sinuous due to alternate flaking. Wood structure is prominent.

d) Pointed handadze (Pl.II no.4, Fig.II no.3). The specimen is tabular in shape, worked only to produce a cutting edge which ends with a pointed projection in the middle. The raw material is coarse grained. Large portion of cortex is preserved.

e) Pick-like handadze (Pl.XIII no.2, Fig.1 no.1). This specimen is longish and heavy with tapering ends. It is plano-convex in shape having highly worked convex dorsal surface with steep side flaking and plain ventral surface, with some marginal retouches. It shows yellowish brown patination and use-marks.

3. Chopping-Tools: (Pl.III Fig.IV). This is a very significant type of the Early Palaeolithic of Tripura and are made on bigger pebbles of fossil wood.

a) Chopping-tool with alternately flaked edge (Pl.III no.1). The specimen is shaped on a very fine grained fossil wood pebble. It has sharp zigzag cutting edge, produced by removing flakes alternately on upper and lower surfaces. The cutting edge is convex.

Movius (op.cit:356) states that it is possible to reproduce these implements by using hammerstone and a direct percussion technique on a piece of fine-grained, homogeneous fossil wood.
b) Chopping-tool with alternate double edge (Pl.III no.2, Fig.IV no.2). The specimen is disc-shaped, almost fully worked except some cortex in the middle of dorsal. Big and steep flakes are removed radially irrespective of the grain of the wood, in such a way as to produce an alternate double-edged tool.

c) Chopping-tool with rounded edge (Pl.III no.3). This tool is shaped on a heavy blank of fossil wood, roughly rectangular in shape. The working edge is at right angle to the longer axis. The flaking is confined mainly to working edge and lateral sides, leaving a thicker middle part with cortex and thinner peripheral portion with flake marks. The working end shows heavy battering marks, the result of use.

d) Chopping-tool with double edge (Pl.III no.4, Fig. IV no.1). It is prepared on a cylindrical shaped fossil wood pebble showing steep flakings only at the two ends to produce double working edges, leaving big cortex. The working edge has a sinuous outline due to alternate detaching of large flakes.

4. Cleavers: (Pl.IV nos. 1 & 2, Fig.V nos. 1&2). These constitute one of the very important Early Palaeolithic tool types of Tripura. They are roughly quadrangular to oval in shape, prepared on fine grained variety of fossil wood, parallel to wood structure. They are heavy tools made on chunks. The sharp single working edge is produced by removing large oblique flakes on dorsal side resulting in thicker and a blunt butt-end. The convex cutting edge is sinuous (Pl.IV no.1) or oblique (Pl.IV no.2) and the distal end is uneven.
B. FLAKE TOOL-TYPES

Table 24 shows the relative frequency of the flake tool assemblage of Tripura.

TABLE 24

<table>
<thead>
<tr>
<th>Types of Tools</th>
<th>Frequency (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Awls</td>
<td>4 (2.6)</td>
</tr>
<tr>
<td>Borers</td>
<td>10 (6.4)</td>
</tr>
<tr>
<td>Scrapers</td>
<td>98 (62.4)</td>
</tr>
<tr>
<td>Notched scrapers</td>
<td>2 (1.3)</td>
</tr>
<tr>
<td>Knives</td>
<td>15 (9.5)</td>
</tr>
<tr>
<td>Burins</td>
<td>2 (1.3)</td>
</tr>
<tr>
<td>Points</td>
<td>26 (16.5)</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>157</strong></td>
</tr>
</tbody>
</table>

Levalloisian Flakes (Pl.V nos. 1-9, Fig.VI nos. 1-5). This series is well represented in the Late Palaeolithic of Tripura. These are not only abundant but also varied. Majority of the Levalloisian flakes is removed across the grain of the raw material. Only fine grained fossil wood is employed for this purpose. The different types are as follows:

a) Triangular flakes (Pl.V nos. 1, 4, 6). Triangular flakes are removed across the wood fibre. Prominent bulb of percussion and faceted striking platform are present. The flakes are marginally retouched.

b) Tabular flakes (Pl.V nos. 2, 3, 6, Fig. VI no. 4). The
flakes are detached transverse to the grain of wood and show convex flake surface and faceted striking platform. The conchoidal impressions on the flake surface and cortex on the lower surface are very conspicuous (Pl.V no.2). Retouches are present (Pl.V nos. 3,5, Fig. VI nos.4).

c) Oval flake (Pl.V nos.7, Fig.VI no.3). This is rather big in size having a beak like projection. Faceted striking platform and convex flake surface are prominent. Some retouches are evident near the beak.

d) Discoidal flakes (Pl.V no.8, Fig.VI nos. 1 & 2). These are roughly circular or discoidal. Centrally directed flakes are removed along the periphery, alternately on either surface, leaving major part unworked (Pl.V no.8, Fig.VI No.1). Secondary touches are present along the periphery. Prominent bulb of percussion and faceted striking platform are seen (Fig.VI no.2).

Awls: (Pl.VI nos. 7-10, Fig.VII no. 1 & 2).

These are generally made on flake, along or oblique to wood structure. The different types of awls present are shown below:

TABLE 25

<table>
<thead>
<tr>
<th>Types of Awls</th>
<th>Frequency (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Awl with oval shape</td>
<td>1 (25)</td>
</tr>
<tr>
<td>Awl with parallel side</td>
<td>1 (25)</td>
</tr>
<tr>
<td>Awl with triangular shape</td>
<td>1 (25)</td>
</tr>
<tr>
<td>Awl with rectangular outline</td>
<td>1 (25)</td>
</tr>
<tr>
<td>Total</td>
<td>4</td>
</tr>
</tbody>
</table>
a) Awl with roughly oval shape and short working end (Pl.VI no.7, Fig.VII no.2) working end is parallel to long axis of the tool.

b) Awl with parallel sides and needle like working end (Pl.VI no.8). The working end is formed at oblique to the long axis of the tool and prepared carefully by executing secondary flaking and retouches.

c) Awl with triangular outline (Pl.VI no.9). The working point is 'V' shaped, produced by detaching a long oblique flake, occasional working apparent at the tip.

d) Awl with rectangular outline (Pl.VI no.10, Fig.VII no.1). This is made on a long flake. The pointed working end is carefully prepared by oblique flakings only near the proximal end.

Borers: (Pl.VI nos.1,2,4,6, Fig.XI no.8, Fig.XII no.4).
These are made on both cores and flakes. The different types of borers present are tabulated and described below:

<table>
<thead>
<tr>
<th>Types of Borers</th>
<th>Frequency (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Borers on cores</td>
<td>2 (20)</td>
</tr>
<tr>
<td>Borers on Levalloisian flakes</td>
<td>3 (30)</td>
</tr>
<tr>
<td>Borers on non-Levalloisian flakes</td>
<td>5 (50)</td>
</tr>
<tr>
<td>Total</td>
<td>10</td>
</tr>
</tbody>
</table>

a) Borer on core (Pl.VI nos. 1,4,6). These are roughly
triangular (no.1) or lunate (no.6) types. The borer point is slightly curved and at an oblique, and shows beak-like projection due to oblique flaking.

b) Borer on Levalloisian Flake (Pl.VI no.5, Fig.XI no.8). The borer is made on a roughly rectangular Levalloisian and flake which shows faceted striking platform. It is prepared by removing oblique flake to produce an oblique borer point.

c) Borer on free flake (Pl.VI no.2). It is made on a triangular side flake. The working point is V-shaped.

Scrapers: (Pl.VII nos.1-9, Fig.VIII nos.1-5 & Fig.IX nos.1-5). Scrapers constitute the most dominant class of Flake-tools of Tripura, both in variety and abundance. These are comparatively large and are made on both cores and flakes, the former being larger. The different varieties of scrapers found are tabulated and described below:

<table>
<thead>
<tr>
<th>Types of Scrapers</th>
<th>Frequency (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Side-scrapers</td>
<td>26 (26)</td>
</tr>
<tr>
<td>End-scrapers</td>
<td>42 (42)</td>
</tr>
<tr>
<td>Double-side-scrapers</td>
<td>6 (6)</td>
</tr>
<tr>
<td>End-cum-side-scrapers</td>
<td>5 (5)</td>
</tr>
<tr>
<td>Concave (Hallow) scrapers</td>
<td>6 (6)</td>
</tr>
<tr>
<td>Notched scrapers</td>
<td>2 (2)</td>
</tr>
<tr>
<td>Thumb-nail scraper</td>
<td>1 (1)</td>
</tr>
<tr>
<td>Core scrapers</td>
<td>12 (12)</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>100</strong></td>
</tr>
</tbody>
</table>
a) Side-scraper on core (Pl.VII nos. 1 & 3, Fig. VIII no.1, Fig.IX nos. 1 & 4). i) Quadrangular scraper on core, comparatively big showing secondary flaking and fine retouches and ii) oval shaped scraper.

b) Side-scrapers on side flake (Pl.VII nos. 2 & 5). Oval in shape, occasional secondary working at the working edge.

c) Concave side-scraper on flake (Fig.IX no.4) It is roughly triangular in shape and has a broad concave working edge.

d) Concave (Hollow) scraper on flake (Pl.VII nos. 4, Fig.VIII no.4). It is roughly circular in outline with a pointed projection, flaked on both the surfaces.

e) Thumb-nail scraper (Pl.VII no.6, Fig.VIII no.5). It is roughly circular in outline with a prominent bulb of percussion.

f) End-scraper on flake (Pl.VII no.8). It is small, roughly triangular in shape and prepared parallel to the grain of the wood. Working edge is straight, fine retouches are present.

g) End-scraper on core (Pl.VII no.9, Fig.VIII no.3). It is prepared by removing one long flake on the lower surface and two oblique flakes on the upper surface, parallel to the grain of the wood. Cross-section is triangular. The working edge is produced by removing secondary flakes. Edge wear is evident.

h) Concave end-scraper on core (Fig.IX no.2). Roughly triangular in outline having a broad and slightly concave working edge. Fully worked by secondary flakings and fine edge retouching.
1. End-cum-side-scraper on core (Pl.VII no. 7, Fig.IX no. 4). Triangular in shape and cross-section. Working edges are present in the proximal and right lateral sides, centrally directed flakes are removed leaving maximum thickness in the middle, which is mainly cortex.

j) Notched scrapers: (Fig.XIII nos. 1 & 2). These are some special tools in Tripura stone industry, prepared on tabular flakes. The notch is produced by carefully removing one deep flake from left lateral side (no. 1) or small flakings and retouches in the broader end of the tool (no. 2).

Knives: (Pl.VIII nos. 1-8, Fig.X nos. 1-5).

Knives are well represented in the Tripura tool assemblage. The various types of knives are shown in Table 28 and described below:

**TABLE 28**

<table>
<thead>
<tr>
<th>Types of Knives</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Knives with concave working edge</td>
<td>2</td>
</tr>
<tr>
<td>Knives with straight working edge</td>
<td>3</td>
</tr>
<tr>
<td>Knife with sinuous working edge</td>
<td>1</td>
</tr>
<tr>
<td>Knives with convex working edge on flake</td>
<td>2</td>
</tr>
<tr>
<td>Knives with convex working edge on core</td>
<td>3</td>
</tr>
<tr>
<td>Knives with oblique working edge</td>
<td>2</td>
</tr>
<tr>
<td>Knife with a tang</td>
<td>1</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>15</strong></td>
</tr>
</tbody>
</table>
a) Knife with concave working edge (Pl.VIII nos. 1 & 4, Fig.X no.3). Prepared on lunate type of flake in such a way as to give a sharp concave cutting edge. Cortex is present on the butt end. Beak-like projection is seen (Pl. VIII no.1).

b) Knife with straight working edges (Pl.VIII no.2, Fig.X no.1). The knife is prepared on a small side flake. The working edge is very sharp produced by detaching an oblique flake on the upper surface. One end is U-shaped and the other is pointed.

c) Knife with denticulate edge on flake (Pl.VIII no.7, Fig.X no.2). It is prepared on a large leaf-shaped end-flake.

d) Knife with convex working edge on flake (Pl.VIII no.5, Fig.X no.5) It is produced on a longitudinal end flake by detaching a narrow oblique flake on upper surface to prepare the working edge, leaving a large cortex on the butt end.

e) Knife with convex working edge on core (Pl.VIII no.6). It is prepared on a core with a convex working edge. Butt is thicker. The raw material is fine grained.

f) Knife with oblique working edge on flake (Pl.VIII no.3). It is on a leaf-shaped flake. The working edge is straight, but is oblique to longer axis.

g) Tanged knife (Pl.VIII no.8, Fig.X no.4). This is prepared on a long flake. The working edge is slightly convex and sinuous. The tang is produced by removing a step flake at the distal end, apparently for hafting purpose.

Non-Levalloisian Core (Pl.IX). It is a large blank of coarse grained fossil wood detached from a log of silicified wood,
having convex upper surface with deep flake scars, probably produced by stone hammer technique.

**Burins (Pl.XII no.3, Fig.XI no.6).** It is prepared on a tabular shaped Levalloisian side-flake having faceted striking platform and prominent bulb of percussion. The burin point is prepared by knocking off two sub-vertical flakes on either side.

**Points (Pl.XI nos.1-7, Fig. XII nos. 1-6).** The relative frequency of various types of points are as under:

<table>
<thead>
<tr>
<th>Types of Points</th>
<th>Frequency</th>
<th>(%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Points on flakes</td>
<td>19</td>
<td>(73.07)</td>
</tr>
<tr>
<td>Points on cores</td>
<td>4</td>
<td>(15.38)</td>
</tr>
<tr>
<td>Tanged point</td>
<td>1</td>
<td>(3.84)</td>
</tr>
<tr>
<td>Rhombhoidal points</td>
<td>2</td>
<td>(7.69)</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>26</strong></td>
<td></td>
</tr>
</tbody>
</table>

a) Point on flake (Pl.XI nos. 1,2,4,6,7, Fig.XII nos. 4,5,6). These are prepared on flakes and show a few flake scars on the upper surface.

b) Point on core (Pl.XI no.3, Fig.XII no.1). This is comparatively large and prepared on core of roughly triangular shape with a flat flake surface. The specimen is worked only to produce the working end by deep, medium size flakes, leaving large cortex. The distal end is rectangular. Cross-section is roughly triangular.
c) Tanged point (Fig.XII no.2). The tanged point is prepared on a Levalloisian side-flake. Secondary working and retouching are found on the upper surface. The tang is produced on the upper surface by removing a step flake at the distal side.

d) Rhomboidal point (Pl.XI no.5, Fig.XII no.3). The point is made on a small flake. The working end is produced by detaching two oblique flakes on the upper surface.

C. BLADE TOOL-TYPES

Blades: (Pl.X nos.1-6, Figs XI nos.1-5). Table 30 shows the relative frequency of the blade-tool assemblage of Tripura:

<table>
<thead>
<tr>
<th>Types of Blades</th>
<th>Frequency</th>
<th>(%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Blades with concave working edge</td>
<td>5</td>
<td>38.5</td>
</tr>
<tr>
<td>Blades with convex working edge</td>
<td>3</td>
<td>23.0</td>
</tr>
<tr>
<td>Blades with straight cutting edge</td>
<td>5</td>
<td>38.5</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>13</strong></td>
<td></td>
</tr>
</tbody>
</table>

a) Blade with concave working edge (Pl.X nos.1, 2, 6, Fig.XI no.5). The blades are made on long flakes and have slight or deep concave working edges (Pl.X no.6, Fig.XI no.5).

b) Blade with convex working edge (Pl.X nos.3 & 5, Fig.XI no.2). These are made on a tabular flakes across the wood fibre (Pl.X no.3) or along on long flakes (Pl.X no.5, Fig.XI no.2). It shows fine retouches. The cutting edge is convex.
c) Blade with straight cutting edge (Pl.X no.4, Fig.X nos.1,2,3). These have been prepared on long flakes. The cutting edge is straight with dentations and is slightly oblique to the long axis or parallel to the long axis (Fig.XI nos.3).

Fluted Blade Core (Pl.XII nos.9, Fig.XI no.6). It is cylindrical with faceted platforms. The core is fluted all around by removing several narrow blade flakes from both the ends.

The relative frequency of various types of Palaeolithic tools of Tripura is given below and in Figs. 25-31.

<table>
<thead>
<tr>
<th>Types of Tools</th>
<th>Frequency</th>
<th>(%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chopping-tools</td>
<td>7</td>
<td>3.59</td>
</tr>
<tr>
<td>Handaxes</td>
<td>4</td>
<td>2.05</td>
</tr>
<tr>
<td>Handadzes</td>
<td>10</td>
<td>5.10</td>
</tr>
<tr>
<td>Cleavers</td>
<td>4</td>
<td>2.05</td>
</tr>
<tr>
<td>Scrapers</td>
<td>98</td>
<td>50.26</td>
</tr>
<tr>
<td>Notched scrapers</td>
<td>2</td>
<td>1.02</td>
</tr>
<tr>
<td>Awls</td>
<td>4</td>
<td>2.05</td>
</tr>
<tr>
<td>Borers</td>
<td>10</td>
<td>5.13</td>
</tr>
<tr>
<td>Knives</td>
<td>15</td>
<td>7.69</td>
</tr>
<tr>
<td>Points</td>
<td>26</td>
<td>13.33</td>
</tr>
<tr>
<td>Burins</td>
<td>2</td>
<td>1.02</td>
</tr>
<tr>
<td>Blades</td>
<td>13</td>
<td>6.67</td>
</tr>
</tbody>
</table>

Total 195
FREQUENCY HISTOGRAMS OF TOOL TYPES & SUB-TYPES

Fig. 25. HEAVY TOOLS

Fig. 26. FLAKE TOOLS

Fig. 27. SCRAPERS

Fig. 28. KNIVES

Fig. 29. POINTS

Fig. 30. BLADE TOOLS

Fig. 31. PALAEOLOTHIC TOOLS

Vert. Scale : 1 cm = 10 %
Index to Tool Sub-types given in Page 154
A comparison with Movius' study (Movius 1943, Table 3 & 4: 360 & 370) of the relative frequency of the Early Anyathian tools of Burma shows that handadzes are the most dominant tool types in the fossil wood series, whereas chopping tools are the most abundant tool types in the silicified tuff series. However, our study in Tripura (Table 31) shows that scrapers and handadzes constitute the largest class (50.26%) amongst the flake-tools and heavy tools (5.10%), respectively; followed by points (13.33%), Knives (7.69%), blades (6.67%), borers (5.13%), chopping-tools (3.59%), handaxes (2.05%), cleavers (2.05%), awls (3.05%), burins (1.02%) and notched scrapers (1.02%).

D. MICROLITHIC INDUSTRY

a) Microlithic flakes (Pl.XII nos.2,4,6-13). The microliths are found in small percentage in Tripura, but their presence is no doubt very significant. The microlithic flakes consist of mainly non-geometric forms such as, micro-points (Pl.XII, nos.2,4,6-8,12) and micro-scrapers (Pl.XII nos.10 & 11) and some geometric forms viz, microblades and trapezes. The bulb of percussion is clearly seen in some of the flakes (nos.4,6 & 13).

b) Microlithic cores (Pl.XII nos.1,5&9). Microlithic cores are quadrangular or cubic in shape having faceted ends. Longitudinal scars are present due to removal of blades along the fibre. The wood structure is very conspicuous.
NEOLITHIC INDUSTRY

1) Early Neolithic Industry

Early Neolithic industry of Tripura is represented by tools such as chipped axes, chisels, hammerstones etc.

Chipped adzes/axes (Pl.XV nos.1-3 & Pl.XVIII no.9, Fig.XV nos.1-2)

a) Chipped-adze with U shaped working edge (Pl.XV no.1, Fig.XV no.2). It is longish with parallel sides, mostly chipped on the upper surface, lower is flat. All the tools are made on fossil wood.

b) Chipped-shoe last celt (Pl.XV no.2). It is prepared on fossil wood and shows plano-convex cross-section. The upper surface is worked mostly along the periphery, leaving large cortex in the centre. Working end is convex and sharp.

c) Quadrangular chipped axe (Pl.XV no.3, Fig.XV no.1). It shows fully flaked upper surface by neat flakings. Lower surface is worked mainly along the cutting edge by secondary flaking. Cutting edge is sharp, broad and straight.

d) Pecked axe with rectangular working edge(Pl.XVIII no.9) It is a small axe with rectangular cutting edge.

Pick-axes (Pl.XIII no.1). Pick-axes are prepared on fossil wood core and on pebble along the wood fibre. Working end is narrow, distal end is blunt and shows medium flake scars. Lower surface shows a long deep flake whereas upper surface is mostly cortex.
Chisel (Pl.XIV nos.1-4, Fig.XIV nos.1-3). These are prepared on cores and are triangular in outline. The working end is produced by the intersection of two oblique flakes. The chisel edges exhibit different forms as follows:

i) convex with 'V' shaped distal end (no.1), ii) narrow and straight with pointed distal end (no.2), iii) irregular with parallel sides (no.3) and iv) broad and straight with narrow and blunt butt end (no.4).

Hammerstones (Pl.XVI no.1 & 2, Fig.XVI no.1 & 2). These are rare and are prepared on cylindrical lump of fossil wood with roughly oval cross-section. The specimens show rounding on one or both the ends (no.1) with battering marks apparently due to usage. flakes are also removed along the axes of the specimens. Secondary flakings are seen at the narrow end (no.2).

ii) Late Neolithic Industry

The Late Neolithic of Tripura consists of highly advanced stone tools such as fully ground and polished tools which are described below along with illustrations. This industry is also based on fossilwood.

Grinding Stones (Pl.XVII no.1 & 2, Fig.XVII no.1) Grinding stones are rare in the Tripura Neolithic. These are prepared on heavy blanks of fossil wood of very fine grained variety. The specimens show several concave grinding surfaces parallel
to the long axis. The ends are roughly broken. The cross-
section is slightly circular.

Ground-tools (Pl. XVIII nos. 1-9, Fig. XVIII nos. 1-4). The late
Neolithic of Tripura contain many varieties of ground stone
tools. The following types have been identified from the
collection (See Table 35, p. 198).

a) Fully ground and polished tool with rectangular
cross-section.

b) Fully ground and polished short axe with flaring
dge (no. 6).

c) Ground and polished quadrangular tool with a blunt
square butt end. (no. 7). The edge is reworked by
removing steep flakes. This indicates re-use.

d) Pecked and edge-ground and polished adze (no. 1).
It is oval in shape having broad U-shaped cutting
edge.

e) Pecked and edge-ground axe with U-shaped cutting
dge (no. 2). It is longish with parallel sides.

f) Pecked and edge-ground axe with broad cutting edge
(no. 4). Edge is slightly broken.

g) Fully ground tool, rectangular in shape (no. 5).

h) Pecked and edge-ground tool with a square cutting
dge (no. 3).

i) Edge ground and polished axe with pointed butt (no. 8).

* * *