The Prehistory of Nepal
(A summary of the results of 10 years research)

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Abstract

Under the "Geo-Archaeological Nepal Project" the German Research Council (DFG) has financed in the past 10 years prehistorical investigations in Nepal. Apart from prehistorical research the project included a detailed survey of the geology, palaeontology and biostratigraphy of the Siwaliks in Dang District, the results of which have been published elsewhere. The prehistorical research, with which this paper deals, yielded an unexpected number of prehistoric site of the palaeolithic, Mesolithic and Neolithic period in the foothills of the Himalayas and filled the lacuna in our knowledge about the earliest prehistoric, prebuddhistic occupants in Nepal.

The discovered sites include two in situ sites of handaxes of the Indian tradition, a levallois-like occupation site of blades, scrapers and points in a stratified context, numerous localities number of microlithic sites and a few localities with neolithic remains.

One of the largest and most interesting sites is an occupation site of a mesolithic, but not microlithic, industry with well made adzes, unifaces and corescrapers in the foothills of the Siwaliks in eastern Nepal, called the Patu industry. This assemblage seems to have affinities with South East Asia rather than with the Indian sub-contient and is a Hobinhian-like industry.

Since there was a very badly felt lack of scientific data about the geology, stratigraphy, paleoenvironment etc. of the quaternary period the research included apart from a search for prehistoric sites investigations into the geological background of the selected research areas, especially of the intermontane Dun basins of Dang and Deokhuri. This was felt to be of primary importance of the understanding of any prehistorical findings. These studies have revealed a succession of fluvial, lacustrine and swamp sediments, which, under the influence of tectonic movements, have formed and reformed the alluvial sedimentation and geological history of the Dun basins. Most of the discovered preshistoric localities could be related to the newly established stratigraphical units so that a chronological order of the sites in their stratigraphical framework could be established.

I. Introduction

Until recently no definite prehistoric settlement sites had been recorded in Nepal, neither of the palaeolithic, mesolithic nor neolithic period.

A number of polished stone axes, however, were recorded previously, (Bannerjee & Sharma, 1969; Sharma, 1983) but without any knowledge of their stratigraphical context, origin and age. And of any earlier occupations and stone age cultures nothing was known in Nepal.

This void prompted the author to carry out prehistorical investigations through a geoarchaeological project since 1984 which was approved by the then acting Director General of the Department of Archaeology, Mr. J.L. Sharma and the former Director General, Mr. Ramesh Jung Thapa. The work has yielded for the first time in Nepal stratified evidences of settlements of prehistoric occupation, and resulted, in fact, in the discovery of an unexpected wealth of occupation sites from the palaeolithic to the neolithic in the two areas which have been investigated (Corvinus, 1985, 1987, 1989, 1990, 1991, 1994 in press).

Two areas were chosen for this survey: they were the Dun valleys of Dang- Deokhuri District in the Siwalik foothills in western Nepal and an area along the Rato River in Mahottari District in East Nepal (Fig. 1 and 2).

Apart from a search for prehistoric in situ localities in these areas, a thorough study was carried out at the same time on the geology and stratigraphy of the intermontane Dun valleys and the riverine terraces.

II. Geological background

The investigated area of Dang-Deokhuri lies within the siwalik foothills of the Himalayas in Nepal. The siwalik range (or Churia Hill, as they are called in Nepal) are a continuation of the Siwalik foothills from India. They were formed, prior to their uplift and folding, by the deposition of thick sediments of molasses deposits during the last 13 million years into a large foredeep along the entire foot of the Himalayas from Pakistan to Assam. During the last phase of the Himalayan mountain building these 5000-7000 m thick deposits were folded and fractured to form the youngest mountain range of the Himalayas.

The tectonic activities within the Siwaliks led in this area to the formation of two intermontane tectonically initiated valleys, so-called Dun valleys, the Dang and the Deokhuri basins. They were formed during the Early to Middle Pleistocene when the Siwalik foothills were uplifted and fractured. The tectonic activities are characterized by the movements of a sequence of north-dipping thrust sheets which have been emplaced successively from north to south.

The formation of the Dun valleys belong to this period, but their alluvial fillings have started afterwards in the later Pleistocene. Dates and stratigraphical data about the alluvial sedimentation were not available previously, but the present investigation have established a first geochronological and stratigraphical framework for the Dun valleys.

The Dun valleys, including Dang, Tui and Deokhuri, were once filled to different degrees and under differing tectonic influences, with thick alluvial deposits of Pleistocene to Holocene age. Young tectonic movements along the older established fault and thrust zones, have influenced this sedimemtation to varying degrees. This has been described in a paper, for "Quartaer" and will not be discussed here further.

Only a short outline will be given here which is summarized in Table 2. The oldest deposits in Dang and Tui are basal gravels, overlying Siwalik bedrock. They have yielded at one place in Dang, at Gadari, where these gravels had been exposed by strong recent erosion, a handaxe assemblage in situ (Corvinus 1990, 1991), indicating a probable later Middle Pleistocene age for the alluvial base.

Uncomformably overlying this basal gravel in Dang and Tui are stratified banded, clays and silts of lacustrine origin, intercalated with occasional lateral flash-flood deposits of colluvial gravel of Siwalik sandstones. This succession of sediments, called the Babai Formation, has filled the valleys in Tui and in Southern Dang and forms the 20-30 m terrace above river level (Fig. 3, b in the profiles).

At the margin of the valleys, they are accompanied by unstratified, homogeneous silts of fan-like appearance, which blanket the foot of the hills (Fig. 3, a in the profiles).

The deposits of the Babai formation are quite unconsolidated and therefore easily erodable. The strong

erosional phase of the last 50 years, induced by the heavy deforestation of the area, has dissected the alluvium to such an extent that a badland topography has developed.

Cultural remains of numerous prehistoric sites have been discovered in both valleys as well as in Deokhuri. They are always connected, in one way or another, apart from the handaxe assemblage, with the sediments of the Babai Formation (Corvinus 1985, a, b, 1990, 1994 and in press).

The younger alluvial terrace level is the wide, flat expanse of the lowland valley in Dang and Tui, which has only an elevation of 10-15 m above river level and which, so far, has not yielded any prehistoric sites. The deposits of this terrace are composed of fluvial sands and gravel and black clays, including many lignite horizone, containing abundant mollusc shells (Fig. 3, c in the profiles). These deposits, called the Sitalpur Formation, reach far below the recent river level, as drillings of the oli and gas exploration has shown. The deposits point to an environment of still-water pools and swamps in the valley, during the terminal Pleistocene.

We obtained several C-14 dates from the lignites at Sitalpur cliff in Dang: 13 270 ± 190 B.P. from lignite 1.80 m below surface, and 15 320 ± 280 from a lignite 3.30m below surface.

Table 2 summarizes the stratigraphical history of the Dang-Deokhuri Dun Valleys

III. The prehistorical record

Before recording the prehistorical findings in Dang-Deokhuri area, a very interesting site, found on the higher river terrace of a stream cutting through the Siwalinks in Mahottari District in eastern Nepal will be mentioned, the Patu industry near the Rato Khola. This industry has already been described in more detail (Corvinus 1987, 1989).

1. The Patu industry of the Rato Khola area

A very rich mesolithic-macrolithic culture with well-made adzes, choppers and corescrappers was discovered on the older terraces of the Rato River in Mahottari District in eastern Nepal in 1985. The Rato River has developed a number of well-preserved terraces along its course, at the place where it emerges from the Siwalik foothills of the Himalayas into the Terai plains (Fig. 4).

Two sets of terraces could be distinguished: an older set, including the 60 to 80m terrace levels and a younger one with levels of 40, 25 and 10m levels (Fig. 5)

The older terrace levels are composed of fluvial gravels and red silts and have developed a red soil on their surface and are of Pleistocene age. They are exposing (through erosion) a number of occupation sites on their surface which had been embedded within the upper part of the red silt. The younger set of terraces have no red soils developed but bear a thin grey-brown, humic soil, and they are sterile of prehistoric artifacts.

In a radious of several square km Mesolithic man lived in this area along the Rato river and have left their stone tools on a number of localities, of which patu 2 is the largest and consists of a factory site, while the other localities are smaller occupation places of activity spots.

The occupation sites all belong to one cultural complex of a macrolithic, mesolithic industry which is distinct assemblage and has been described as the Patu industry after the village Patu nearby. The main occupation site of Patu 2 is covered by thousands of artifacts eroded out on the surface from the red soil (Fig. 6). Several plottings of the artifact concentration on the surface have been carried out, where every artifact was collected and where all other stones were counted and analysed before they were discarded.

The Patu industry is characterized by unifacial choppers and by sumatraliths, knives and scrapers and by unifacial corescrapers, the latter being a very typical tool type not only at Patu but everywhere in Nepal in sites of the later Pleistocene and the earlier Holocene.

The most characteristic and dominant tool type at Patu, however, are adzes and adze-like tools with distal adze edges, which show a great variety of form and probably of function. The predominant forms (Fig. 7) have broad distal edges and oval or rectangular shapes. Oval forms

(Fig 8) with round distal edges and an edge all-round are also present but rare.

There are no microliths nor is there any distinct flake industry from prepared cores. The flakes, which are present, are almost all manufacturing flakes and debris from the manufacture of the large tools, especially of the choppers and corescrapers. The scrapers at Patu (Fig. 9) are usually made on cobble slices or split cobbles, with the lower face left entirely untrimmed.

A special technique of stone fracture has been employed which characterizes the Patu industry: that of splitting large quartzite cobbles along their natural cleavage planes. The split quartzite slices then were flaked and shaped into flat adze by shallow stepflaking. Often on side was left completely untouched, resulting in flat, unifacial adzes, scrapers and unifaces.

On many adzes a gloss (Fig. 7) is observed on their working edges, and it is assumed that they had been used for wood- and grass and specially for bamboo work.

The investigations have revealed that an occupation horizon existed some 0.50 to 0.80 m below the red soil surface of the forested 80m terrace level.

On the slopes, where erosion has set in due to the heavy deforestation, the artifact horizon has been exposed and cut away, and the artifacts have remained as residue on the slopes, which are now covered by a concentration of the washed out artifacts.

A few c-14 dates of some charcoal remnants have been obtained and have given minimum dates around 7000 BP. (6695 ± 155, 6865 ± 110 and 7045 ± 110 B.P.). The charcoal is not from hearths but from burnt wood which may have been brought to the horizon by burrowing animals and may be younger than the occupation horizon. The dates are therefore regarded as minimum ages.

The Patu industry is a very special cultural assemblage and is unique in its kind, not only in Nepal. It has no direct affinities with Indian Mesolithic cultures, where the Mesolithic is characterized rather by microlithic features than by a macrolithic expression. The Patu industry has more affinities to South East Asia, in fact, to the Hoabinhian cultural complex of Vietnam and Thailand. During a recent conference "The Hoabinhian 60 years after Madelaine Collani" in Hanoi in Vietnam in December 1993 we redefined the Hoabinhian of South East Asia, narrowing its geographical and cultural extent. We also discussed similar industries in neighbouring areas, in which the Patu industry was included. The Patu industry is considered to be not Hoabinhian, but a Hoabinhian-like industry from Nepal and is a distinct cultural in Nepal with a distinct technique of its own.

2. Prehistoric sites of Dang-Deokhuri area.

The other area of investigation is in Dang-Deokhuri District in west Nepal and here we have definite affinities with the Indian cultural traditions. The studied area consists of the two intermontane Dun valleys (Fig. 2), described in chapter II.

In most recent times heavy erosion, induced by man's destruction of the forests, has destroyed much of the alluvium and formed a heavily dissected badland topography, which exposed not only the geological strata but also the prehistoric sites embedded in them.

An unexpected number of prehistoric sites were discovered and recorded in the Dun valleys (Fig. 10) and almost all are in stratigraphical association with the Dun valley alluvium.

The oldest sediment filling of the Dang and Tui Dun valleys are fluvial gravels, which were buried by later deposits and are seen only at places where the erosion has cut deep enough for their exposure (Fig. 11).

In these basal gravels a handaxe industry at Gadari in Dang was found, overlying Siwalik bedrock. The handaxes eroded out from the gravel. Only a remnant of the basal gravel is left at this place and one large core was still in situ in the gravel.

The handaxes from Dang are made in the Indian tradition (Fig. 12) and there seems to be no doubt that the people who were responsible for the Dang handaxes must have come from India.

The handaxes and other tools are made of quartizite and have jagged or sinuous bifacial edges all-round and are made by shallow primary flaking and smaller step flakes. A large cleaver was found as well and number of large cores, hammerstones and flakes.

The assemblage is small but quite distinct and is, above all, in stratigraphic position.

It is significant to note that in spite of the systematic prehistoric survey during the last 10 years which have brought to light an abundance of younger prehistoric sites in Dang-Deokhukri, this is only the second site of the early palaeolithic period, the other site being the Satpati site in southern central Nepal, the description of which is in preparation (Corvinus, in press). That means that such sites are rare and handaxe man was not a frequent occupant of the valleys.

The basal gravel is overlain by the succession of mainly lacustrine sediments of stratified clays and silts of the Babai Formation, forming the 20-30m high terrace along the southern flanks of the valley, while at the valley flanks they are accompanied by unstratified fan-like silts which cover the foot of the hills.

Prehistoric man has lived at the margin of the Dun valleys at the foot of the Siwalik slopes, their artifacts being embedded in the colluvial and alluvial deposits. Climatic changes have played an important role in the distribution of man's occupation in the hills. Prehistoric man seems to have lived here during a considerably drier period in the late Pleistocene while towards the end of the Pleistocene the climate had ameliorated again and formed swamps with lignites, pointing to a much improved climate. In modern times the valleys had been very forested until recently when the destruction of the forests has changed the vegetation almost into a desert landscape.

The chronology and stratigraphic provenances of the various cultural occupations in Dang- Deokhuri and at Patu is seen in Table 1 and described as follows, from older to younger:

1. A handaxe industry (Gadari/opp,. Jhaijri) is contained in the oldest deposits in Dang Dun, in basal gravels overlying Siwalik bedrock (Fig. 12), and this may well go down into the Middle Pleistocene.

2. A very large flake/core industry (Brakuti w), made of quartzite is found in basal fluvial cobble gravel below the banded silts in the alluvial valley fill of Tui (tributary of Dang Dun), (Fig. 3, A, below b). The gravel is overlying bedrock, like at the handaxe site, and contains very large flakes and cores and uniface.

3. A middle palaeolithic flake-blade industry with prepared, levallois-like cores and flakes (Fig. 13) at Arjun 3 could be recorded in a horizon at the base of an 8m silt above fluvial gravels of the 30m terrace of the Arjun river in the Deokhuri Dun valley. The site was exposed by the heavy erosion and is a remnant of the formerly extent 30m terrace of the Arjun River. The occupation site is at the base of the terrace block. It has similarities to middle palaeolithic industries in India. We have no dates yet, but the site is stratigraphically above the basal gravels and below the following later industries (from the top of silt), which are of the terminal Pleistocene. Some TL (thermo luminescence) dates of the exmined soil profile at Arjun 3 (Bonget zoeller, pers comm.) give approximate ages of 10000 BP to 29500 BP at respective depth. of 0.20 to 2.50 of the soil profile below the red soil.

4. A rather coarse flake industry in association with choppers and corescrapers and some well-made scrapers (Fig. 14) is abundantly found in the top part of the marginal colluvial fan deposits and in the top horizon of the banded clay/silt succession of the Babai formation of the higher 30m terrace level of Dang and Tui Deokhuri. These are of the terminal Pleistocene.

5. An early Holocene "Mesolithic" industry with well-made adze and corescrapers and choppers (the Patu industry) (Fig. 7-8) which I described earlier, is recorded from the top of the 80 m terrace at Rato Khola in East Nepal. This industry has no comparisons with any Indian assemblage and seems to have affinities rather with South East Asia with some elements (like the "hache courte" and sumatraliths) of the Hoabinhian in Vietnam.

6. A microlithic chert industry with small thumbnail scrapers and lunates (Fig. 15), similar to microlithic inventories in the Indian microlithic, is found at Lamahi and Batar-kund in Deokhuri Dun in the uppermost horizon of the 30m terrace,.

7. Small polished stone axes (Fig. 15) in association with cord marked pottery as it is also found in the Indian neolithic, comes from a grey soil on the surface of the 20 m terrace in Tui at Brakuti and at Basantapur in Dang.

It is still difficult to date the sites, as no fauna and only little charcoal was found in association with the artifacts. Thermoluminescense dating of some the sediments of several sites has given minimum ages for the top of the 30 m alluvium with dates between 12000 to 32000 BP (Zoeller, pers.comm..)

The prehistoric sites in the Dang-Deokhuri Dun valleys together with Tui valley are of great antiquity and of a wide cultural range. Since so many sites have been found only in this area it is to be expected that prehistoric settlements can be found also in other areas in the foothills of the Himalayas in Nepal, and I believe it is only a question of further survey. This, I hope, will be done in the future by other researchers so that comparisons can be carried out and the prehistoric map of Nepal be filled.

The prehistoric research in Dang-Deokhuri and Tui is continued by the author, and excavations are envisaged at the most important sites after her basic scientific research has established the palaeoenvironment and stratigraphy of the Quaternary alluvium, in which the sites have been found, but also the chronological order and cultural affinities of the discovered sites. This is her aim for the continued research. A comprehensive monograph about all prehistoric data from the Dang-Tui-Deokhuri and Rato khola area is in preparation and will be published soon.

Conclusions

Human occupation in Nepal can be dated back at least the later Middle Pleistocene with the discovery of a handaxe culture in Nepal. By the evidences of handaxes in the Himalayan foothills in Nepal the prehistoric occupation in Nepal has a greater antiquity than hitherto expected. They point to connections with the Indian handaxe cultures and are the northeastern-most handaxe populations of the Indian subcontinent. They also indicate that the Himalayas formed the northern boundary of the extention of the classical handaxe cultures of the African and Indian tradition.

Occupation in the Nepal foothills continued during the later Pleistocene and the earlier Holocene with a variety of flake and chopper industries, the oldest of which is a levallois-prepared blade-flake industry at Arjun 3. In the Holocene a microlithic industry in the classical Indian tradition is present in the Deokhuri valley in west Nepal, while in East Nepal a very different Mesolithic industry is found at Patu with adzes, scrapers, unifaces and sumatraliths and no microlithic element at all. The Patu industry seems to have more affinities with southeastern Asia, (with the Hoabinhian), rather than with the classical Indian prehistorical cultures.

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Figures:

Fig. 1: Map of Nepal with studied areas indicated.

Fig. 2: Map of Dang-Deokhuri Dun valleys in western Nepal.

Fig. 3: Crossprofiles through Tui valley (A. and B.) and Dang (c.) . a) and b) is the older alluvium: a) are marginal unstraified silts and b) is the thick clay/silt succession. Both contain prehistoric sites. c) is the youngest 10m terrace alluvium with black clays and sandy silts, with no cultural remains.

Fig. 4: Map of Rato Khola area with prehistoric localities.

Fig. 5: Terraces along Rato and Bawshi Kholas and artifact localities.

Fig. 6: Artefact concentration of Patu site 2a.

Fig. 7: Two round unifacial choppers from Patu (size 1:1).

Fig. 8: Oval and rectangular adzes with broad distal edges from Patu site (size 1:1).

Fig. 9: Oval, partly bifacial adze from Patu, made from a flat slice (size 1:1)

Fig. 10: Scrapers from Patu site, made on flakes and chunks (size 1:1)

Fig. 11: Map of Dang-Deokhuri valley with prehistoric localities indicated.

Fig. 12: Schematic crossection through the Gadari handaxe localities, opposite Jhaijri (Dang Valley).

Fig. 13: Two handaxes from the Gadari site, opposite Jhaijri, (Dang valley) (size 1:2, half original size).

Fig. 14: Artefacts from Arjun 3 site in Deokhuri valley, 1:1.

Fig. 15: Flakes and choppers from Basantapur (a, c, d) and Dolgaon (e) in Dang and from Bhitabang (b) and Gidhiniya (f) in Tui valley (size 1:1).

Fig. 16: Microliths from Lamahi site in Deokhuri valley (upper row) and polished stone axes from Basantapur (left), Dang and Bhitabang (right) in Tui valley (size 1:1).

Table 1: Chronological succession of cultures in Nepal.

Table 2: Quaternary stratigraphy of Dang-Deokhuri valleys and associated prehistoric sites.

Table 1. Chronological Succession Cultures in Nepal.

	West Nepal	East Nepal	stratigraphic context
HOLOCENE	Polished axes, cordmarked pottery (Brakuti, Gadari);		in terrace-top grey soil. Date at Gadari: 1600 BP;
	Microlithic industry (of chert and quartz), no pottery, (Lamahi, Batarkund);	Patu industry of adzes and choppers at patu (Rato R.);	in subsurface of 30m terrace in deokhuri Dun valley;
		Unifacial axes of chabeni;	In red soil of 60 to 80m terrace of Rato River; date: 7000 BP;
LATE PLEISTOCENE	Flake industries with or without choppers and corescrapers, made of quartzite, very common; (Gidhiniya, Brakuti, Gadari, Masuria, Lalmatia, Gairakuti etc.);		alluvial terrace at Siwalik Hill foot;
			upper 30m levels of colluvial clay/silts of Babai Formation in Dang and Tui and 60-80m river terraces of Arjun and Mashot R.;
	Chopper & heavy duty industry of quartzite, (Lape, Sampmarg);		in red soil of the 25m terrace of Babai R., Deokhuri Dun;
	Arjun 3 industry of prepared flakes, blades, points, scrapers & Levallois-like cores;		at base of 8m alluvial silt of 30m terrace of Arjun R. in Deokhuri Dun valley; older than 30000 BP.
			in basal cobble-boulder gravel below banded silt succession in Tui valley;
MID PLEISTOCENE			in basal gravel above bedrock below banded clay/silt succession in Dang Dun valley;
	Brakuti-west flake site, with large flakes, cores upto 30 cm in size and uniface;		in folder alluvial sandstones at Himalayan foot, folded by the last Himalayan tectonic events.
	Gadari handaxe industry with handaxes, cleavers, flake, made of quartzite;		
	and satpati site of handaxes;		

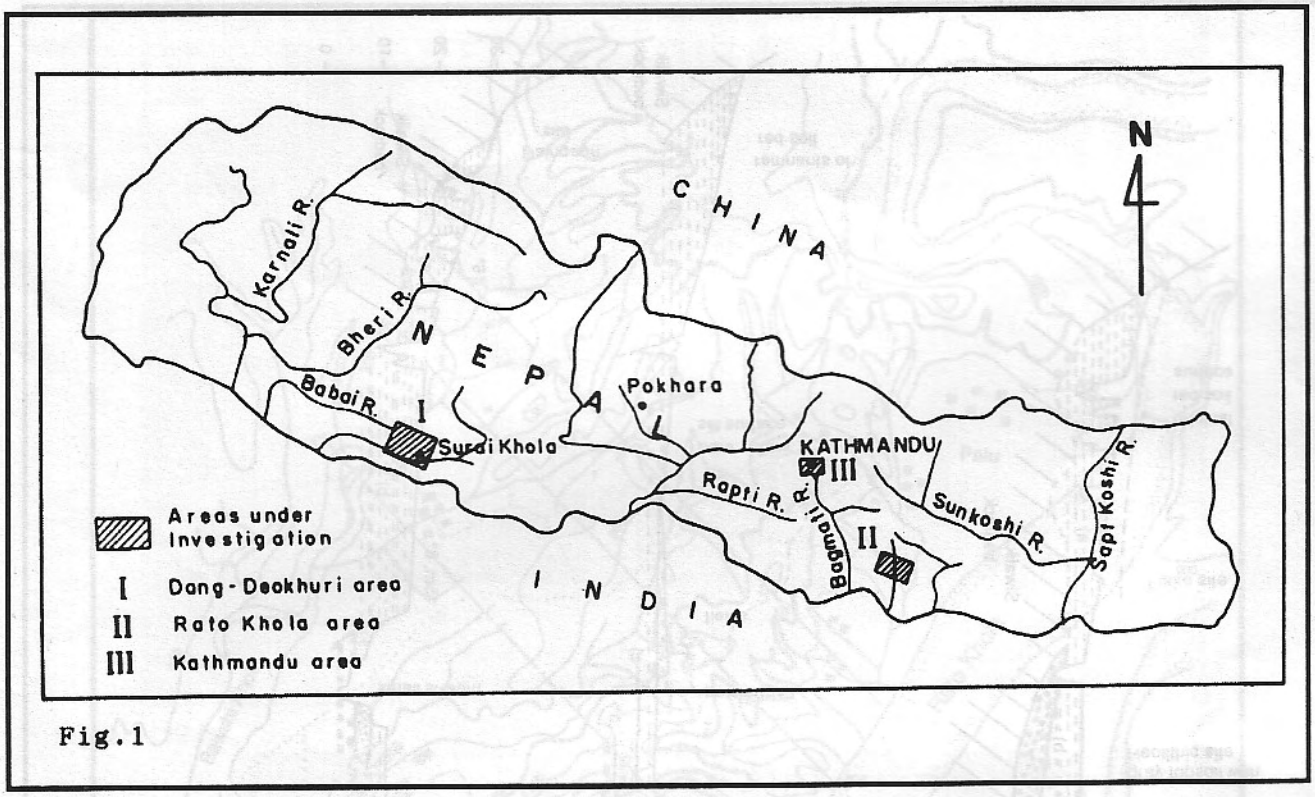

N
CHINA
Karnali R.
Bheri R.
NEPAL
Babai R.
I
Surai Khola
Pokhara
KATHMANDU
III
Rapti R.
Bagmati R.
II
Sunkoshi R.
Sapi Koshi R.
INDIA
Areas under Investigation
I Dang-Deokhuri area
II Rato Khola area
III Kathmandu area

Fig.1

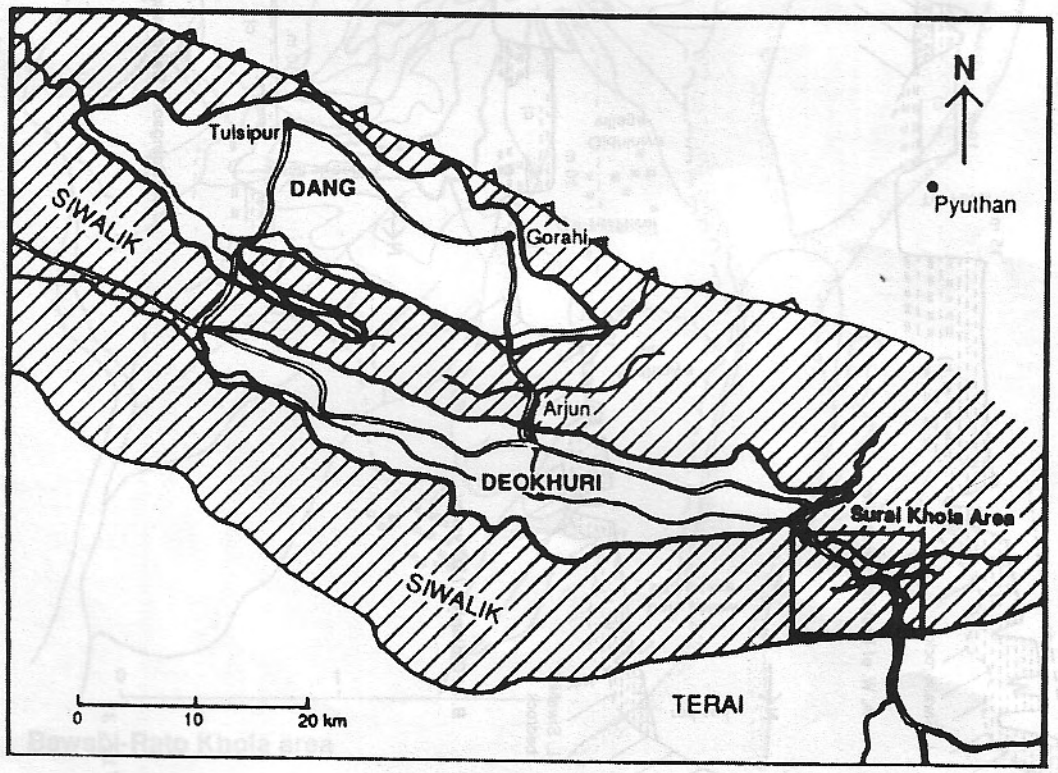

N
Pyuthan
Tulsipur
DANG
SIWALIK
Gorahi
Arjun
DEOKHURI
Surai Khola Area
SIWALIK
TERAI
0
10
20 km

Fig.2

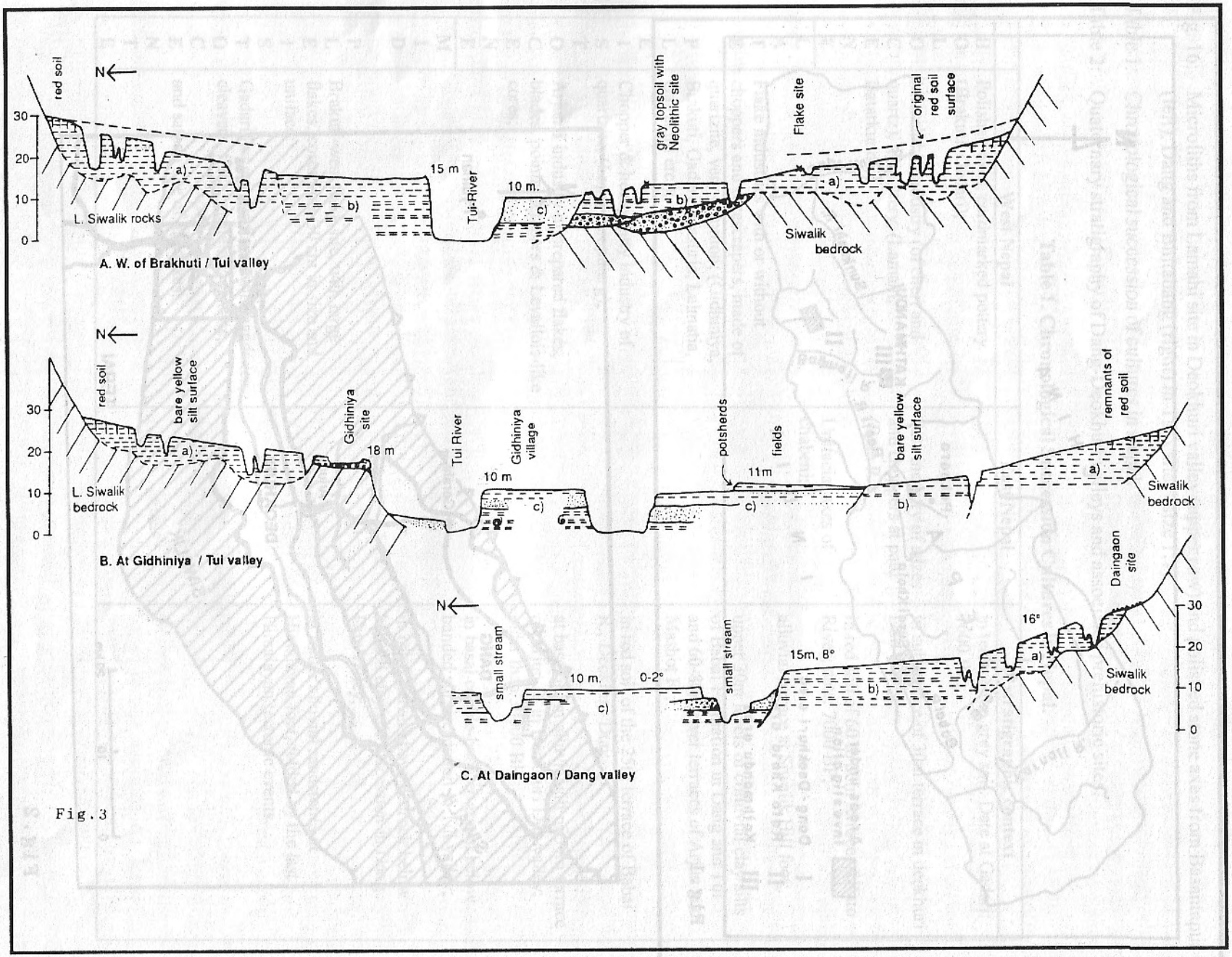
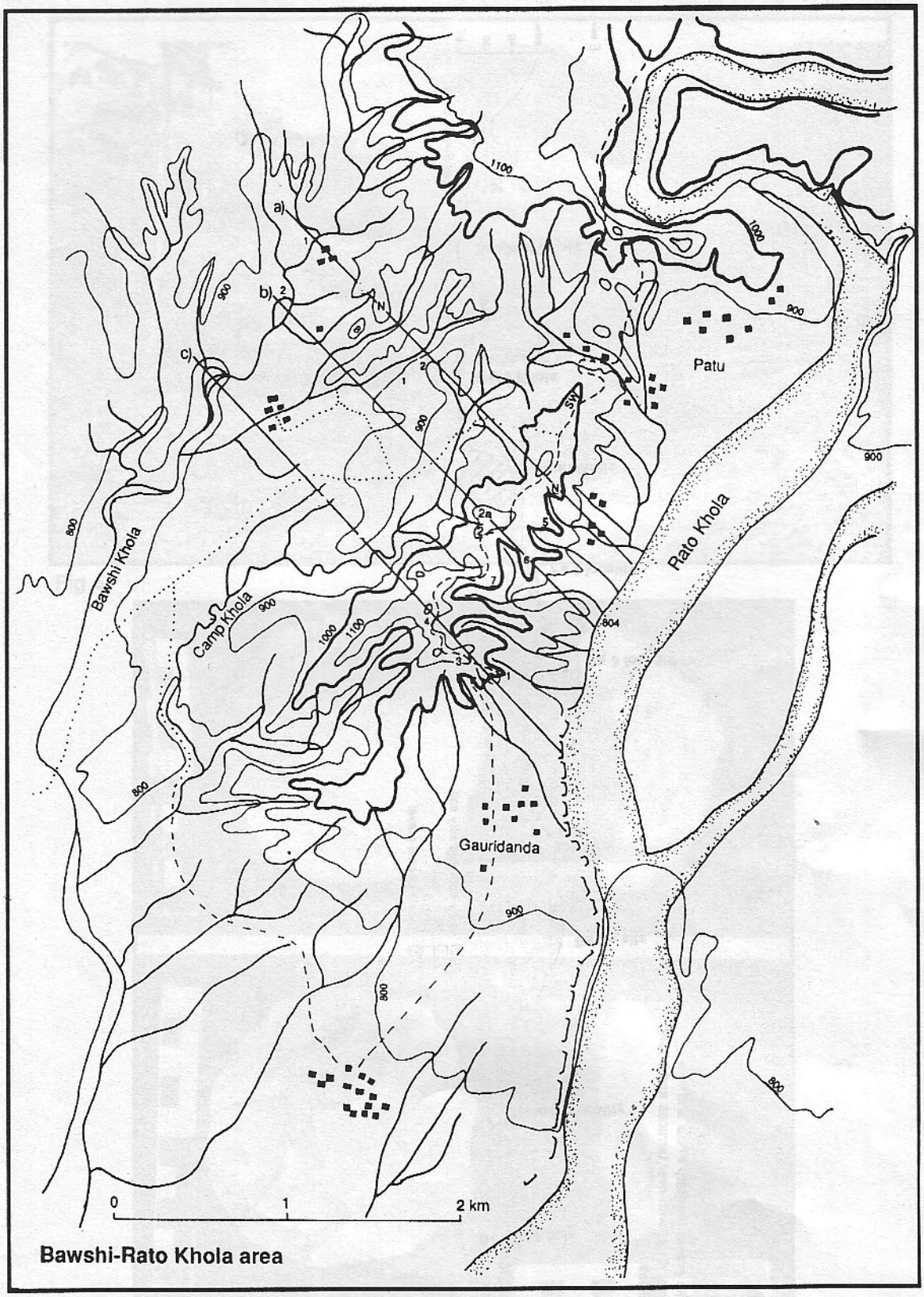

N
red soil
30
20
10
0
a)
b)
L. Siwalik rocks
15 m
Tui-River
10 m.
c)
gray topsoil with Neolithic site
Flake site
original red soil surface
Siwalik bedrock
A. W. of Brakhuti / Tui valley
N
red soil
bare yellow silt surface
Gidhiniya site
18 m
Tui River
Gidhiniya village
10 m
potsherds
fields
11m
bare yellow silt surface
remnants of red soil
L. Siwalik bedrock
Siwalik bedrock
B. At Gidhiniya / Tui valley
N
small stream
10 m.
0-2°
small stream
15m, 8°
16°
Daingaon site
Siwalik bedrock
C. At Daingaon / Dang valley

Fig.3



Bawshi-Rato Khola area

Fig. 4

Profile across the Rato Khola and Bawshi Khola with river terraces and artefact localities

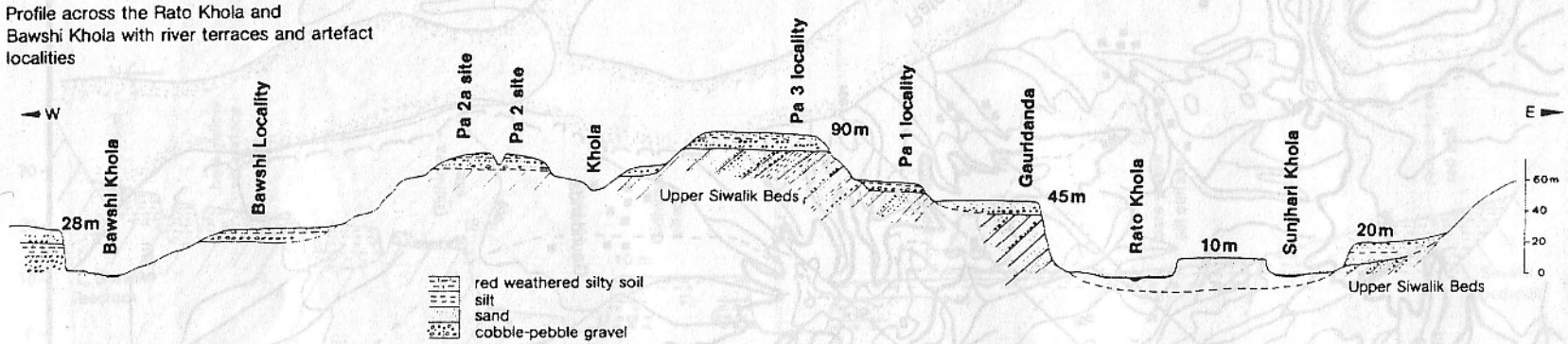


Fig.5

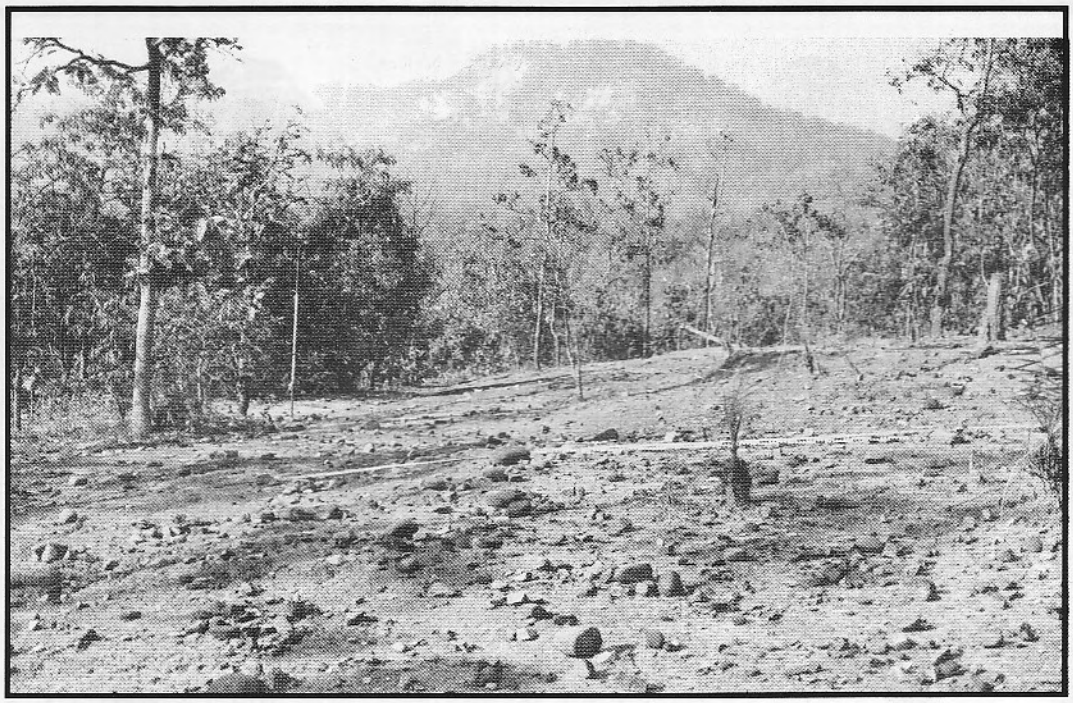


Fig 6

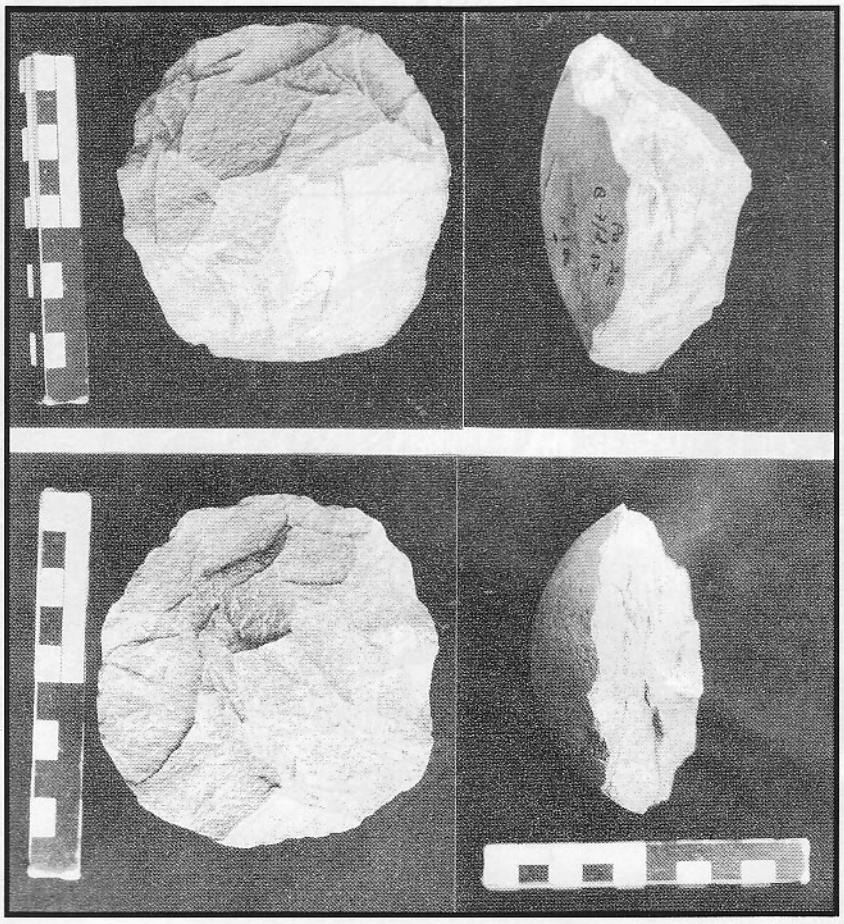


Fig 7

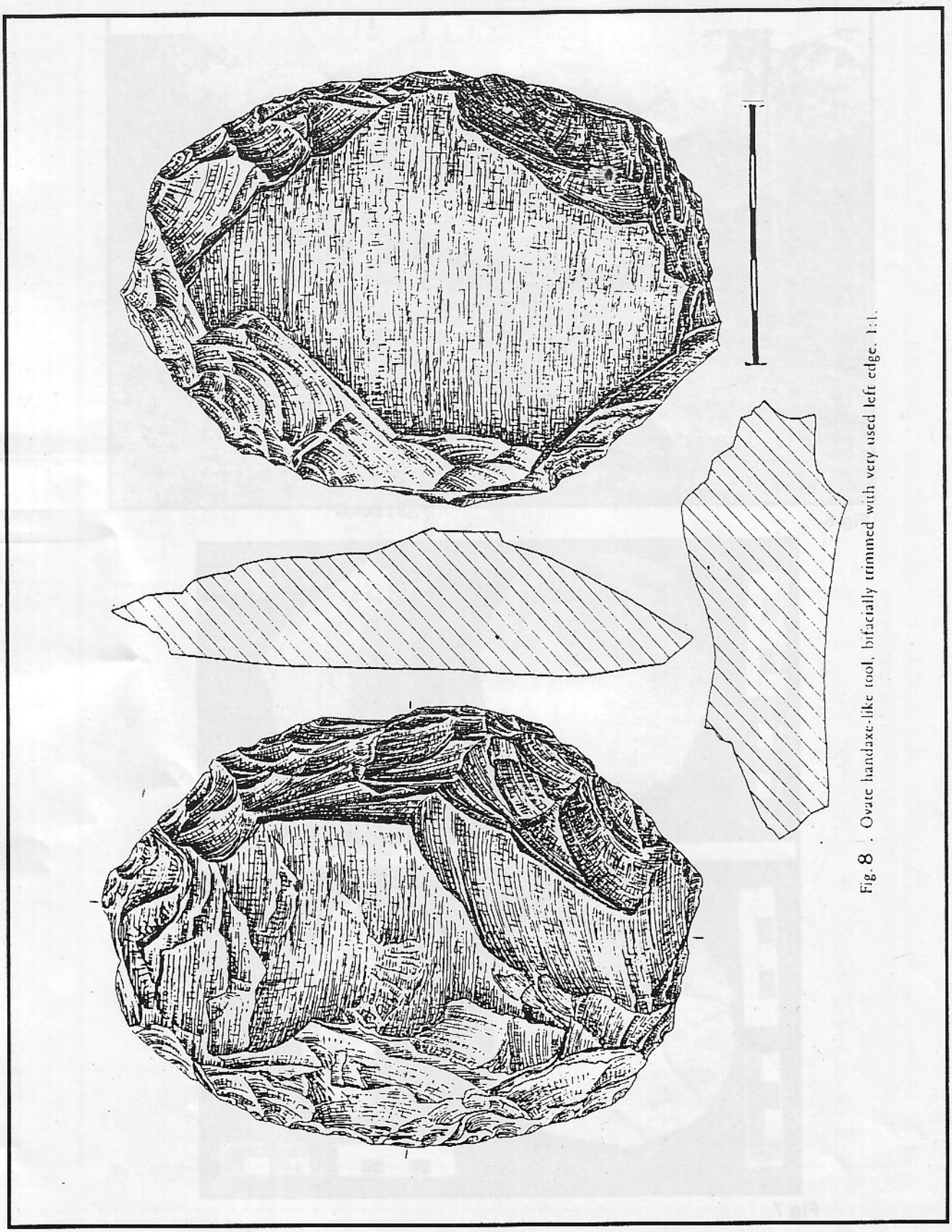


Fig. 8 . Ovate handaxe-like tool, bifacially trimmed with very used left edge. 1:1.

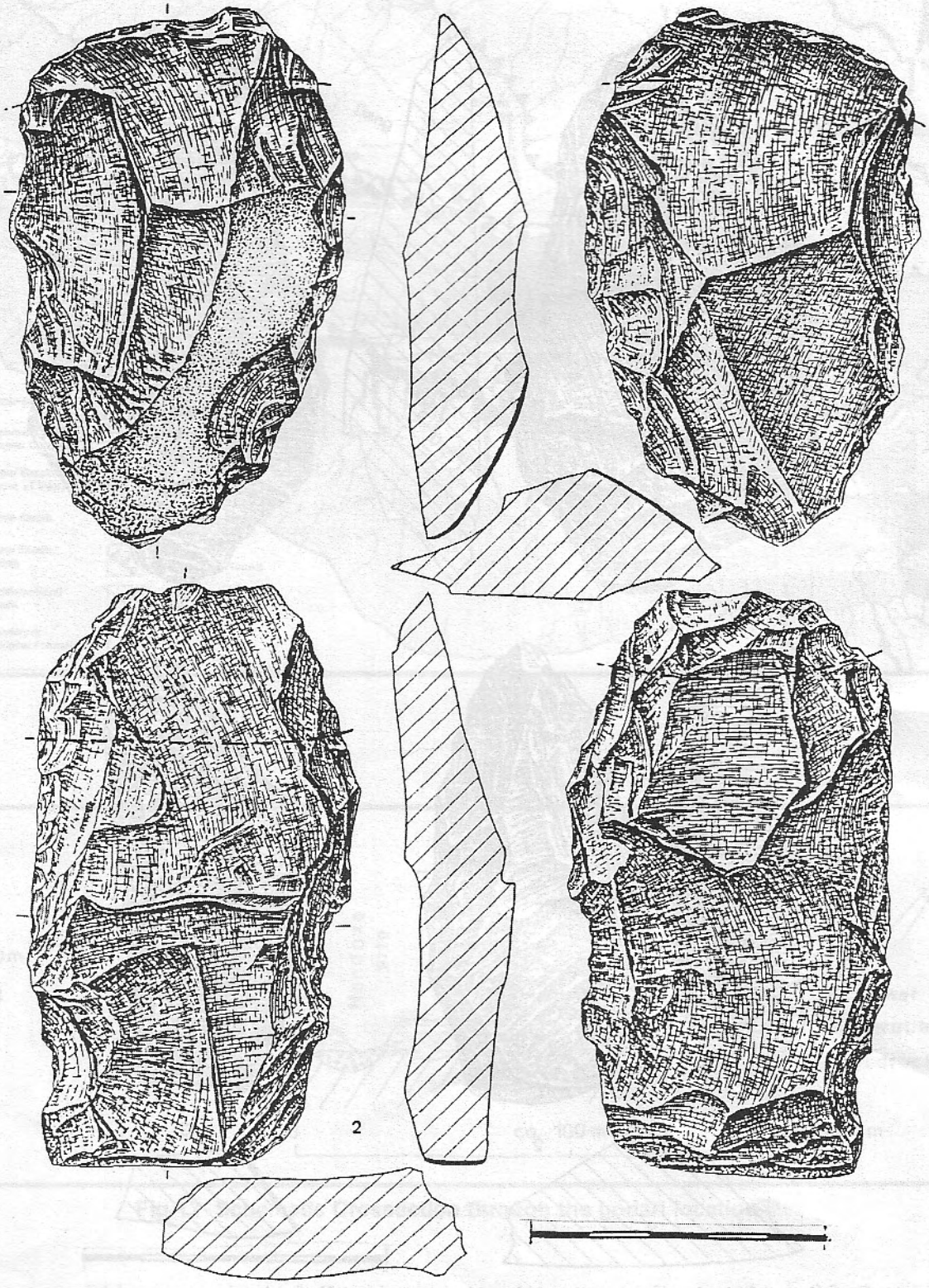


Fig. 9 Two flat adzes with gloss and usemarks at distal edge. 1:1.

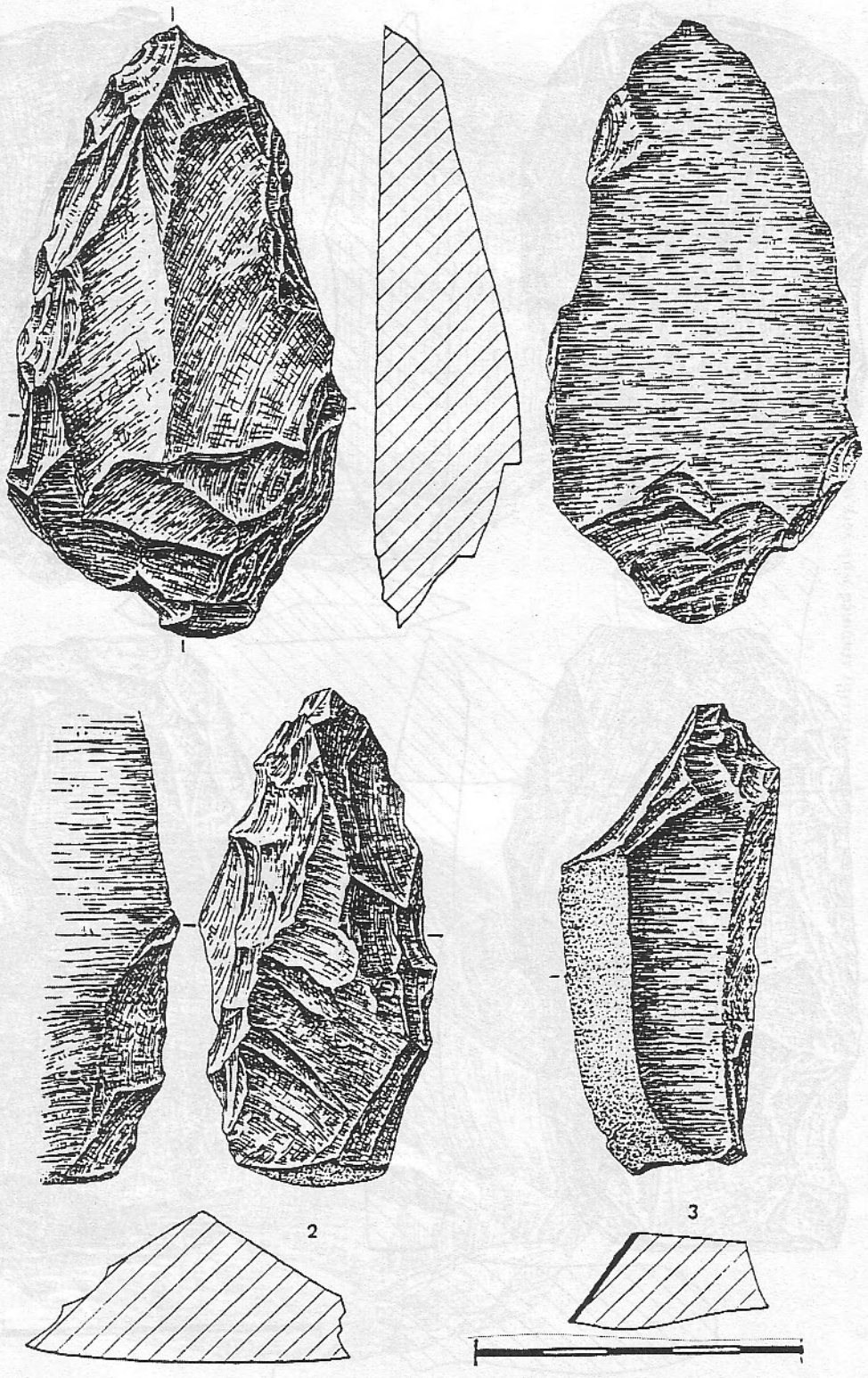


Fig. 10 1 - 2 Pointed unifacial scrapers with usemarks at point. 3 Unifacial endscraper on a debris piece.

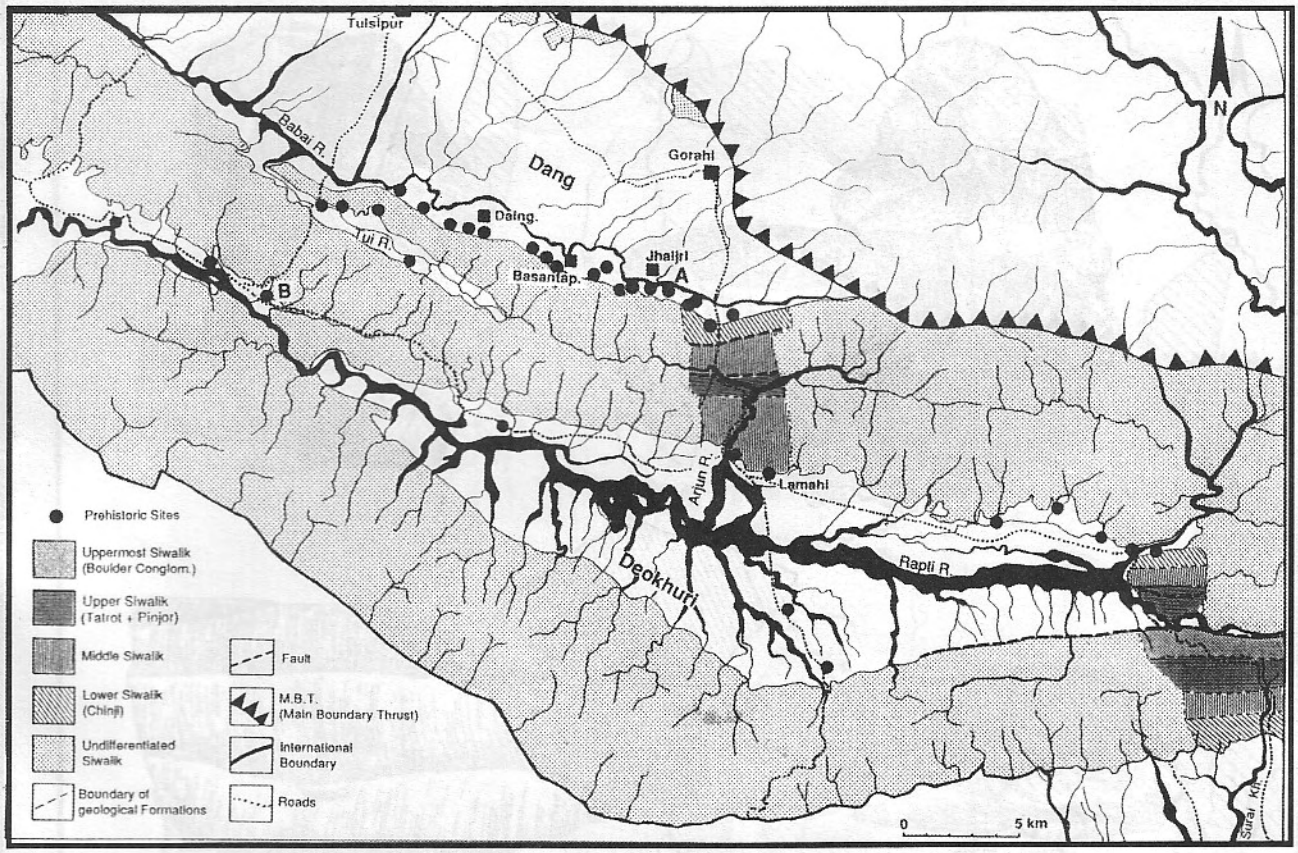


Fig 11

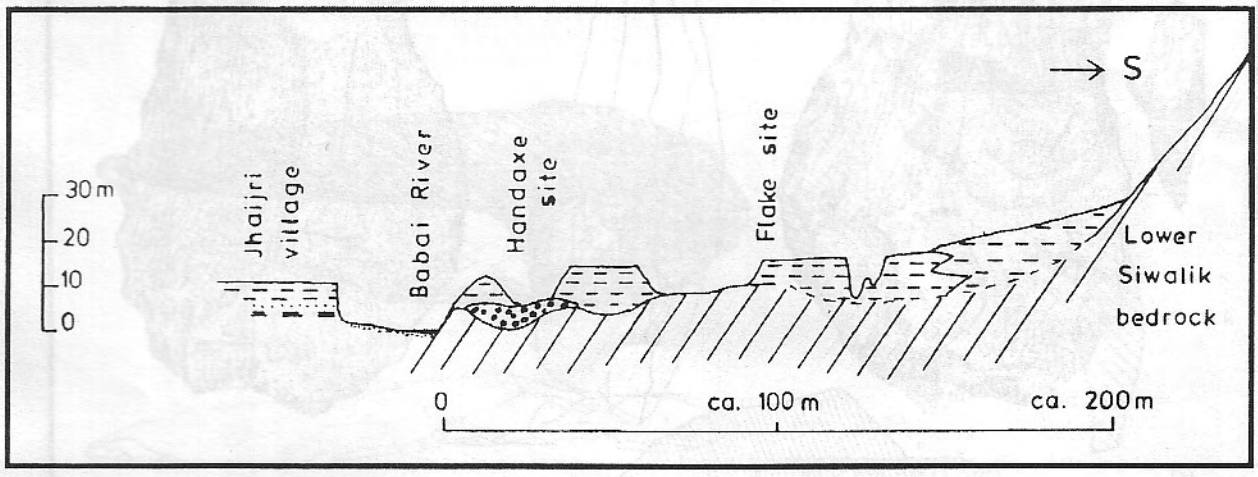


Fig 12 Schematic Crossection through the godari location

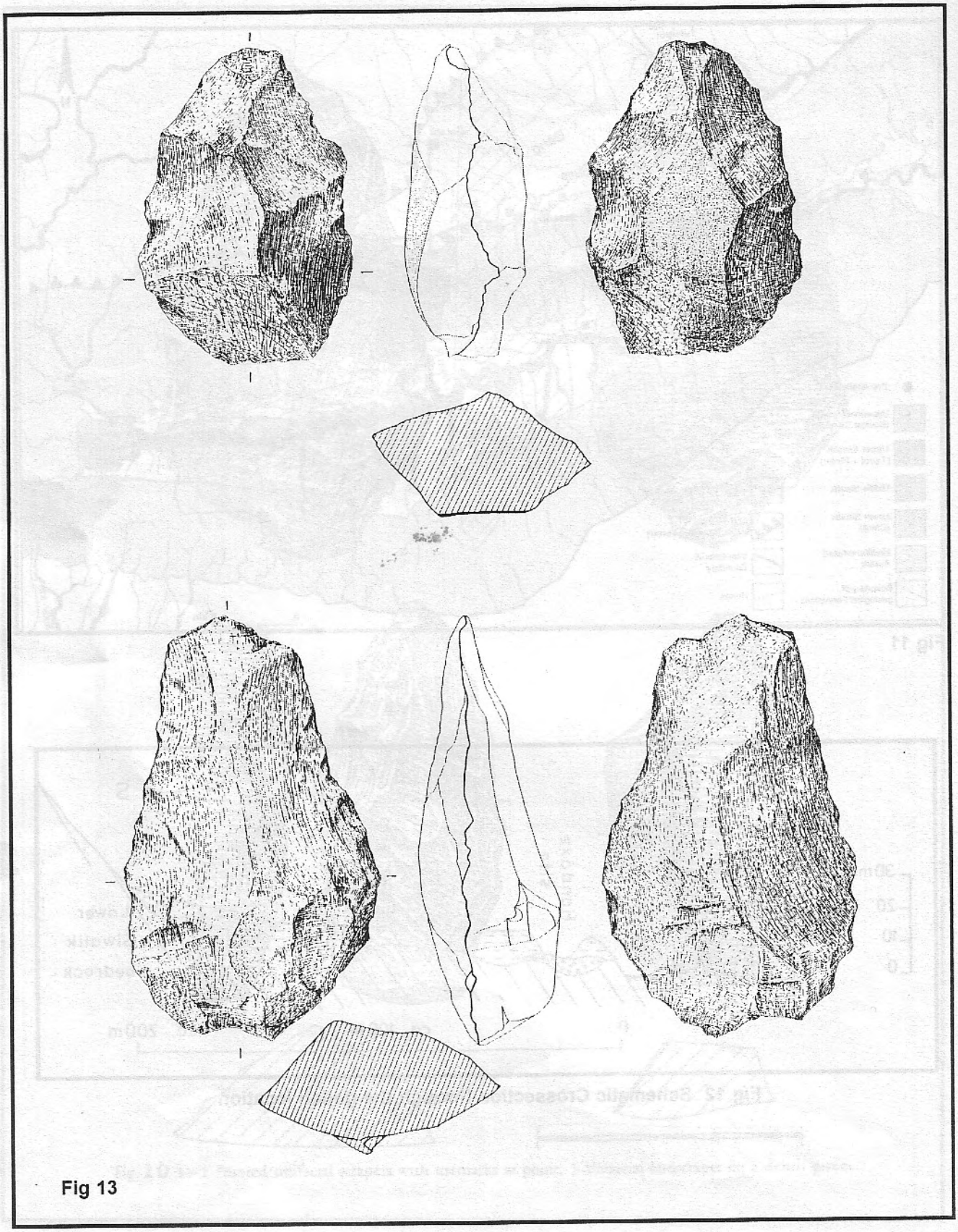


Fig 13

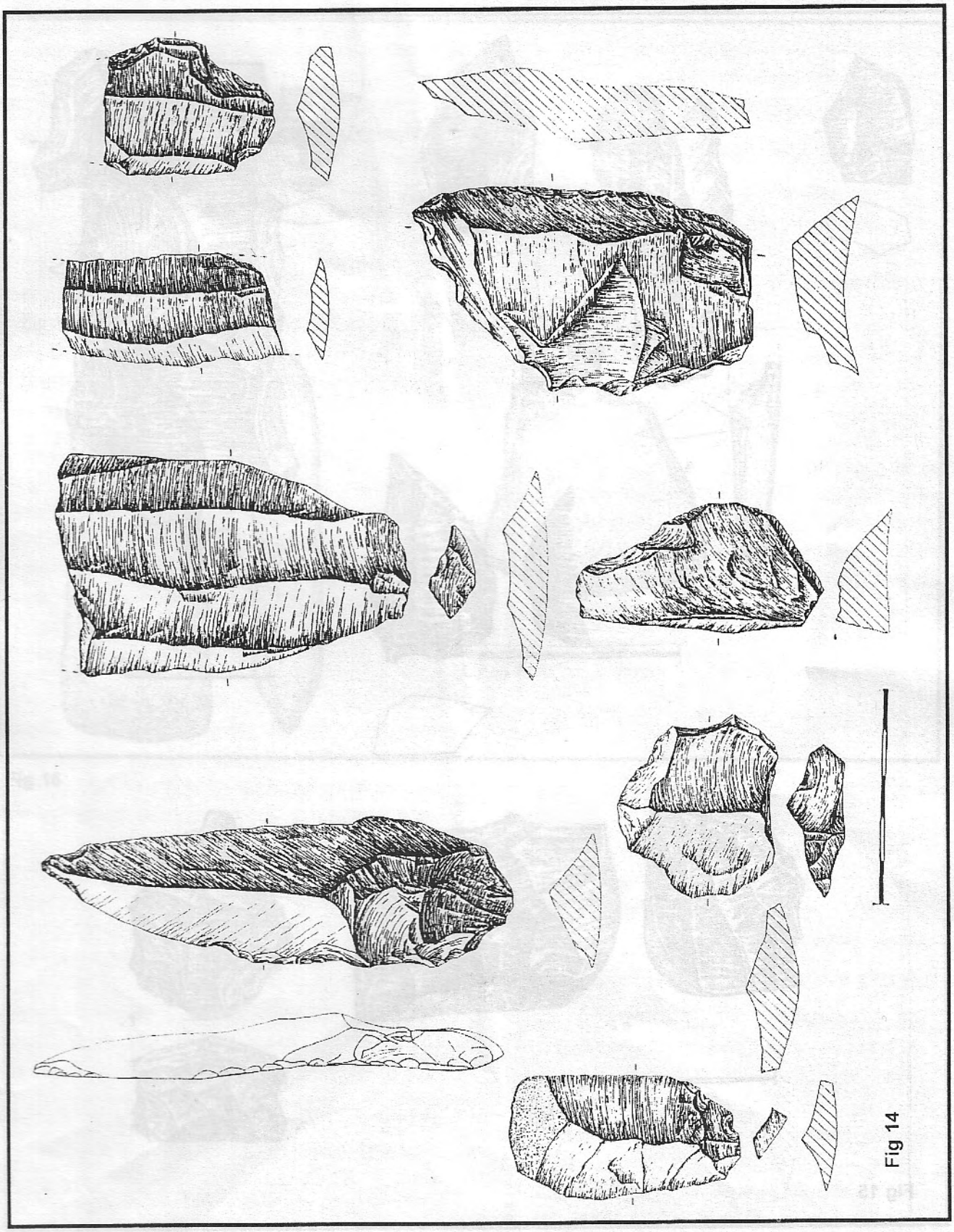


Fig 14

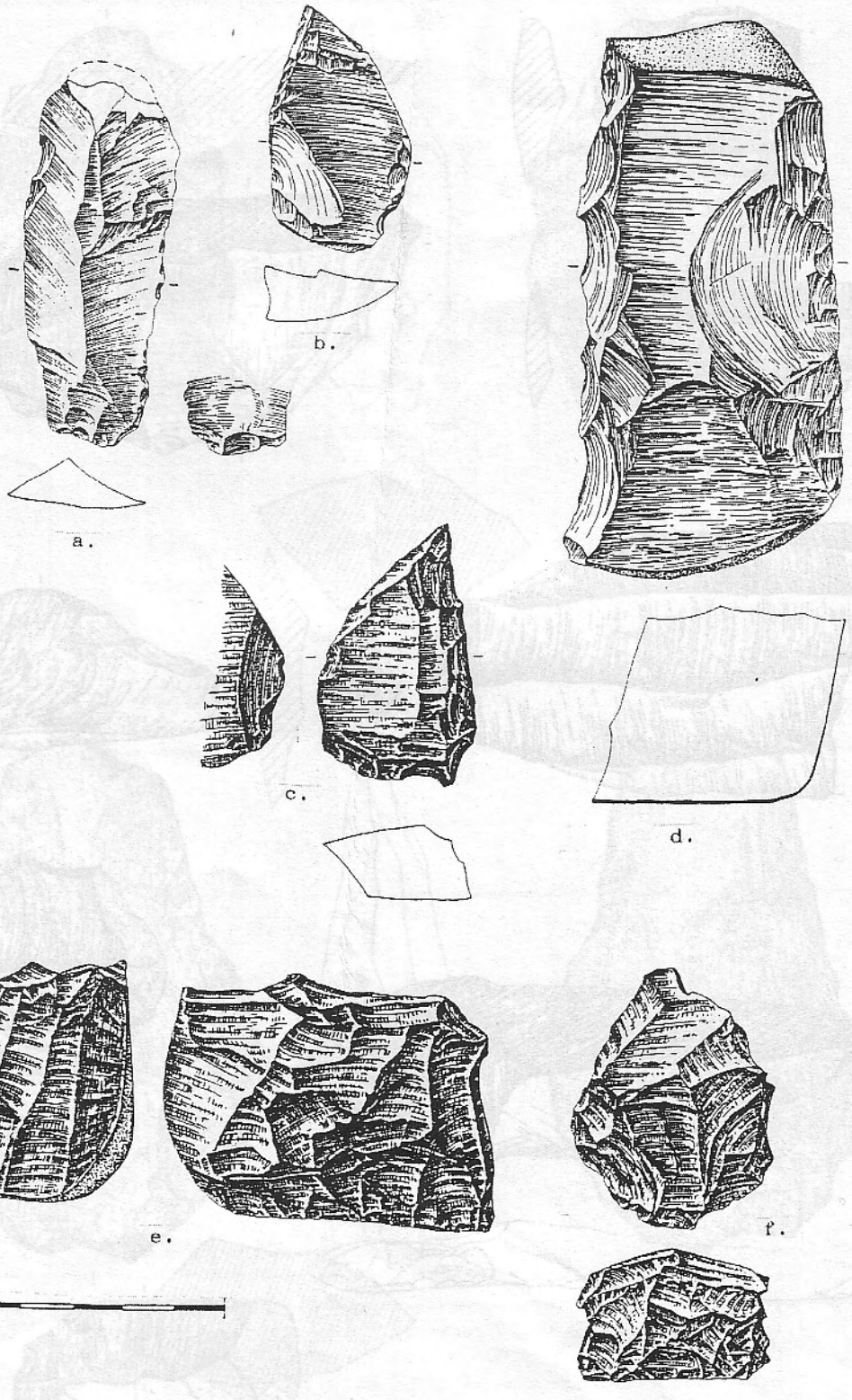


Fig 15

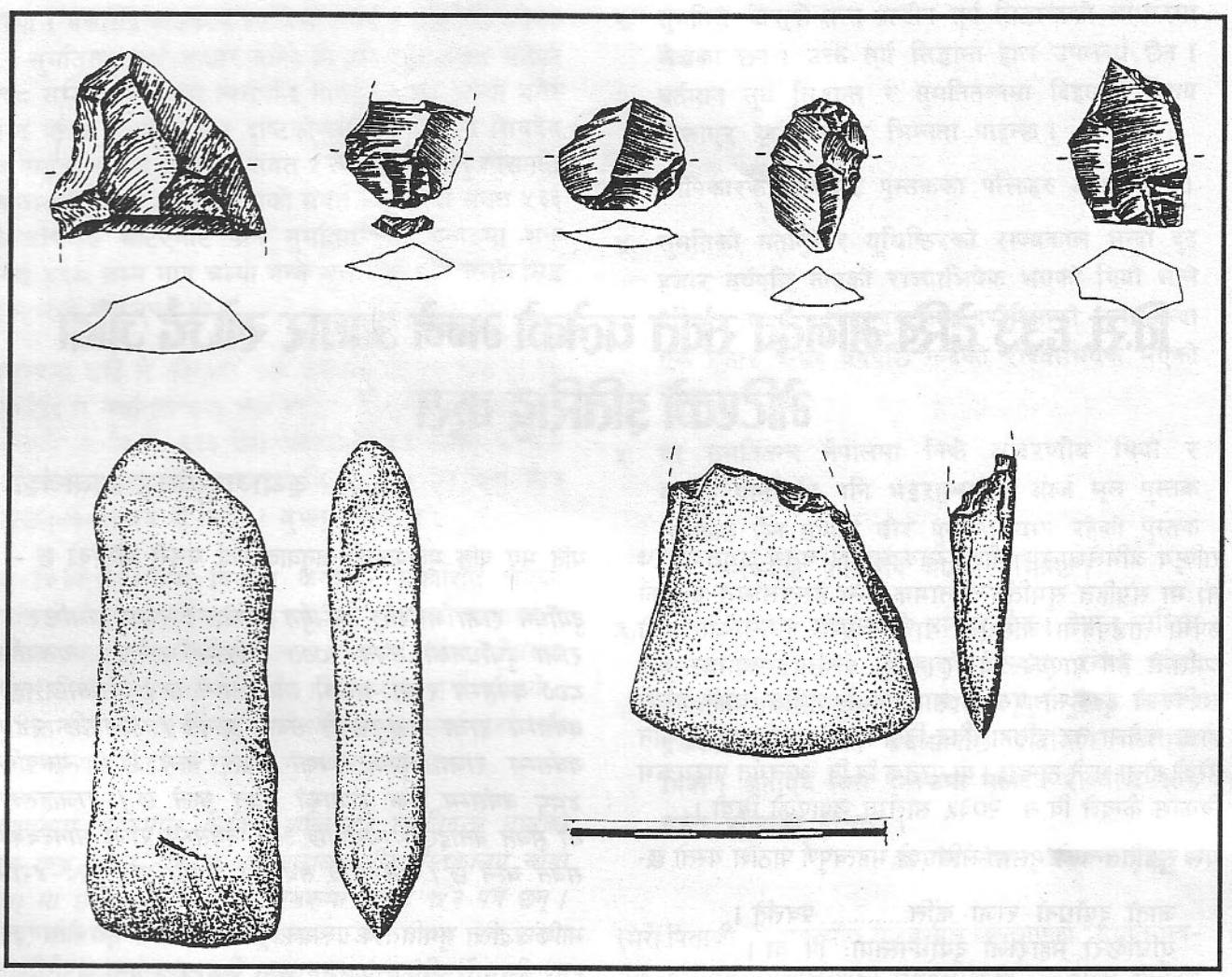


Fig 16