

THE PREHISTORY OF NEPAL AFTER 10 YEARS OF RESEARCH

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ABSTRACT

Under the Geo-Archaeological Nepal Project, the German Research Council (DFG) has financed prehistoric investigations in Nepal in the past 10 years. No archaeological sites of Pre-Buddhist origin had been previously recorded from the country. During the current research, however, an unexpected wealth of Palaeolithic, Mesolithic and Neolithic sites (numbering more than 90 localities) was discovered in the Siwalik foothills of the Himalayas. They include two in situ sites of true handaxes in the Indian tradition, a Levallois-like occupation site of blades, flakes and scrapers in alluvial silts and numerous late Palaeolithic flake localities with and without choppers and core scrapers. There are also a number of microlithic sites and a few Neolithic localities rather damaged by erosion. These localities are all situated in two intermontane tectonic basins in the Siwalik foothills in western Nepal.

In Nepal, until recently, no prehistoric settlements had been recorded and the record consisted only of a few polished stone axes (Bannerjee and Sharma 1969; Sharma 1983). These had no stratigraphical context, origin or age and nothing was known about any earlier occupation. This void prompted the author to carry out prehistoric research by means of a geo-archaeological project since 1984 which has yielded for the first time in Nepal evidence of prehistoric occupation. It resulted, in fact, in the discovery of an unexpected wealth of occupation sites of the Palaeolithic to the Neolithic periods in the two areas which have been investigated (Corvinus 1985, 1987, 1989, 1990, 1991, 1995).

Two areas were chosen for this survey: they were the Dun valleys of Dang Deokhuri in the Siwalik foothills in

West Nepal and an area along the Rato River in Mahottari District in East Nepal (Figures 1 and 2).

THE PATU INDUSTRY OF THE RATO KHOLA AREA.

A very rich industry with well-made adzes, choppers and core scrapers was discovered on the older terraces of the Rato River in Mahottari District in eastern Nepal. The Rato River has developed a number of well-preserved terraces where it emerges from the Siwalik foothills of the Himalayas into the Terai plains (Figure 3). Two sets of terraces could be distinguished: an older set including the 60 to 80 m terrace levels and a younger one with levels of 40, 25 and 10 metres. The older terrace levels have developed a red soil on the fluvial silts and gravels and are of Pleistocene age. Erosion is exposing a number of occupation sites on their surfaces which had been embedded within the upper part of the red soil. The younger set of terraces have no red soils developed but bear a thin grey-brown humic soil and are sterile of prehistoric artefacts.

The sites occur in a radius of about 18 square km on the terraces between the two rivers of Rato and Bawshi. Patu 2 is the largest and consists of a factory site, while the other localities are smaller occupation places or activity spots. The occupation sites all belong to one cultural complex with a macrolithic industry which has been described as the Patu industry after the village of Patu nearby (Corvinus 1987, 1989). The main occupation site of Patu 2 (Figure 4) is covered by thousands of artefacts eroded out on the surface from the red soil.

The Patu industry is characterised by unifacial choppers, "sumatraliths", knives, scrapers and unifacial core scrapers, 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 tools at Patu, however, are adzes and

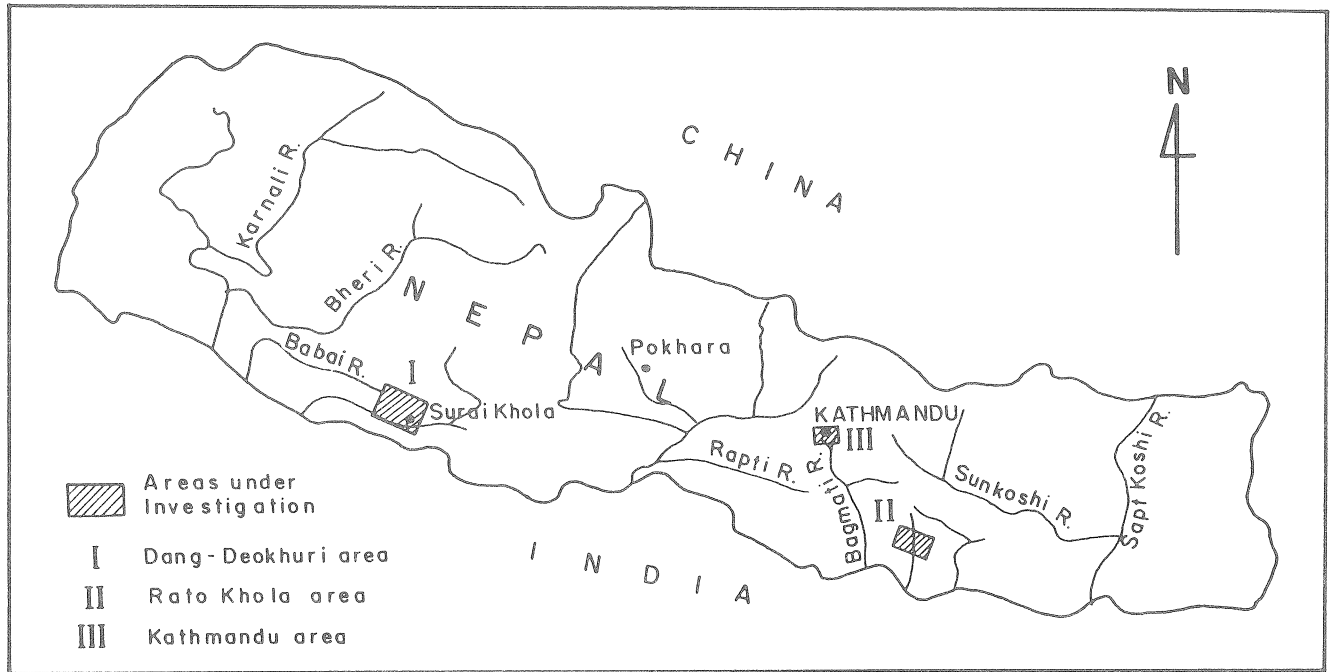


Figure 1: Map of Nepal with studied areas indicated.

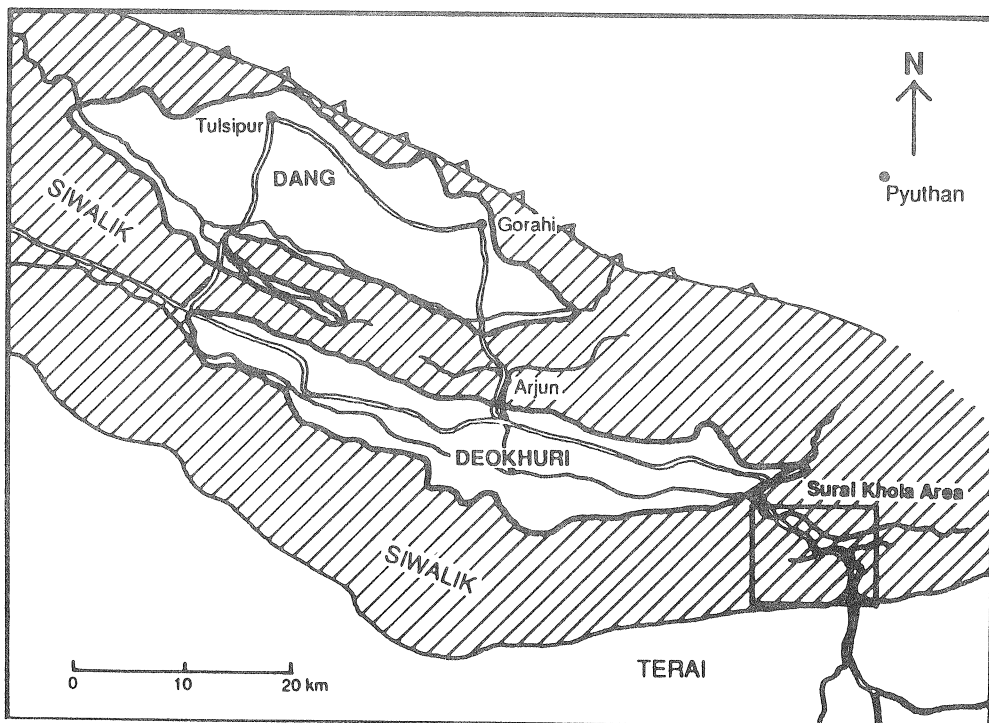


Figure 2: Map of the Dang-Deokhuri Dun valleys in western Nepal.

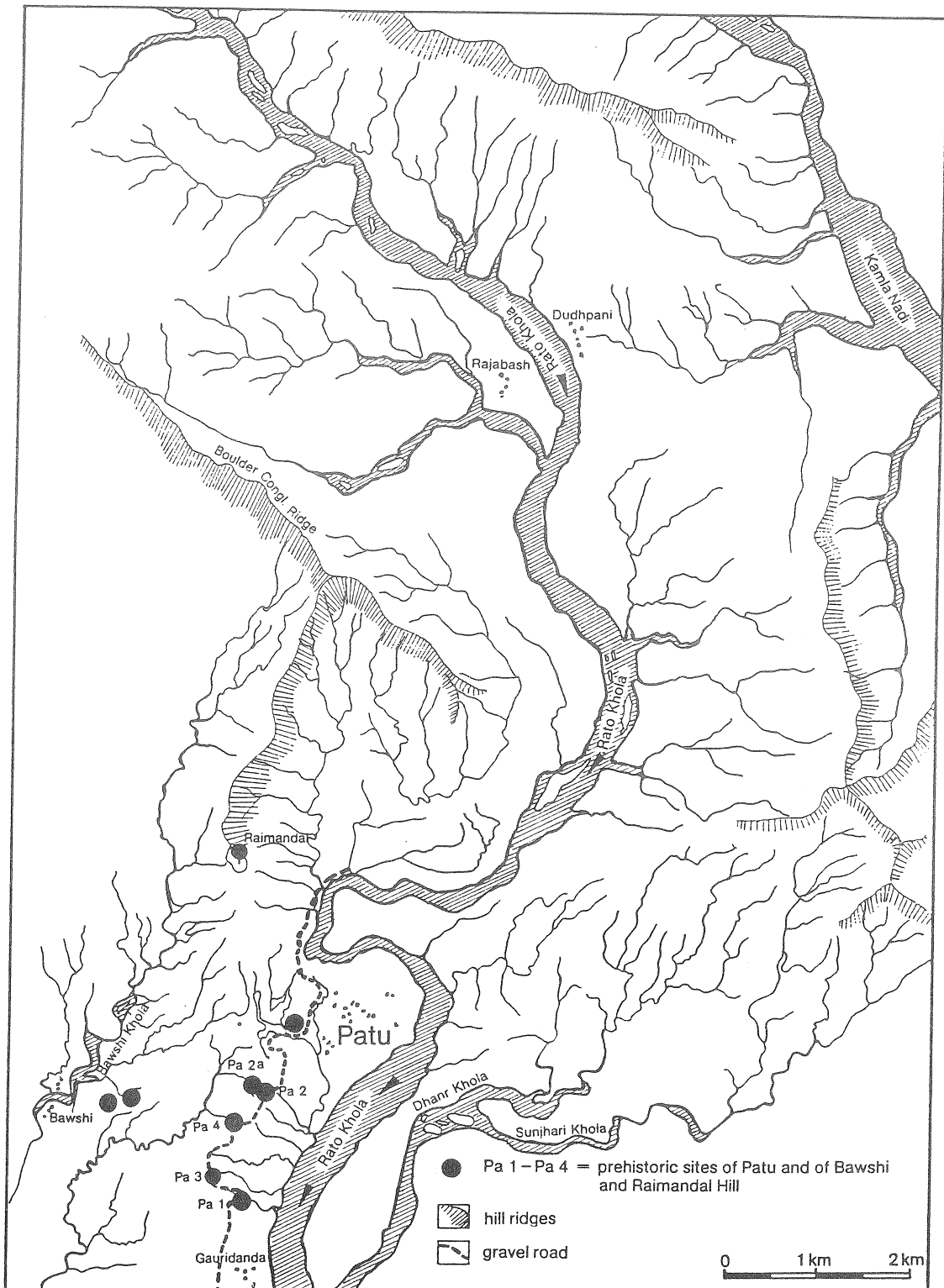


Figure 3: Map of the Rato Khola area with prehistoric localities.

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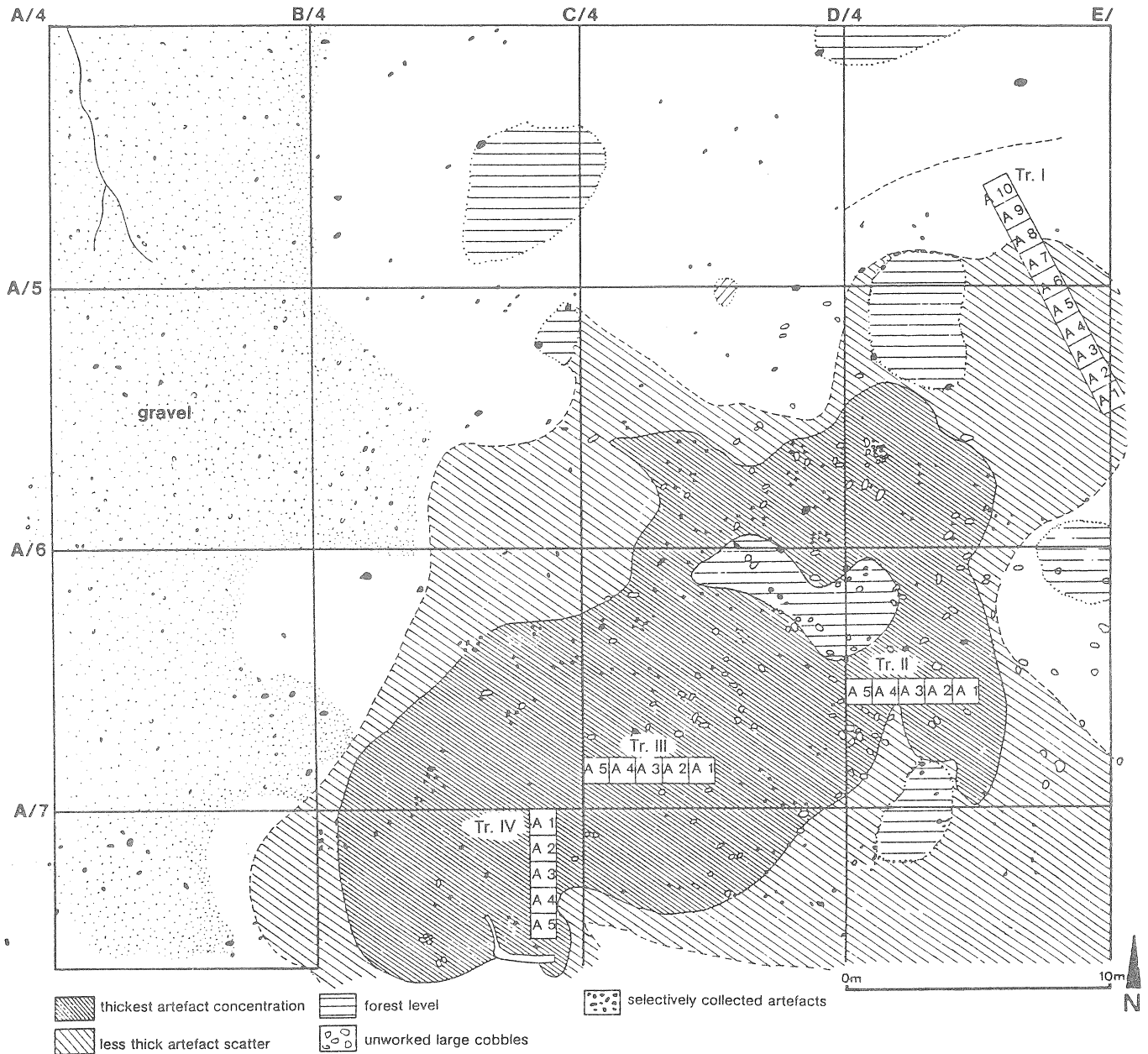


Figure 4: Artefact concentration at Patu site 2a.

adze-like tools with distinct distal adze edges, which show a great variety of form and probably of function. The predominant forms (Figure 5) have broad distal edges and oval or rectangular shapes. Oval forms (Figure 6) with round distal edges and an edge all round are also present but rare.

There are no microliths or flake industry from prepared cores. The flakes, which are present, are all manufacturing flakes and debris from the manufacture of the large tools, especially of the choppers and core scrapers. The scrapers at Patu (Figure 7) are usually made on cobble slices or split cobbles, with the lower faces left entirely untrimmed.

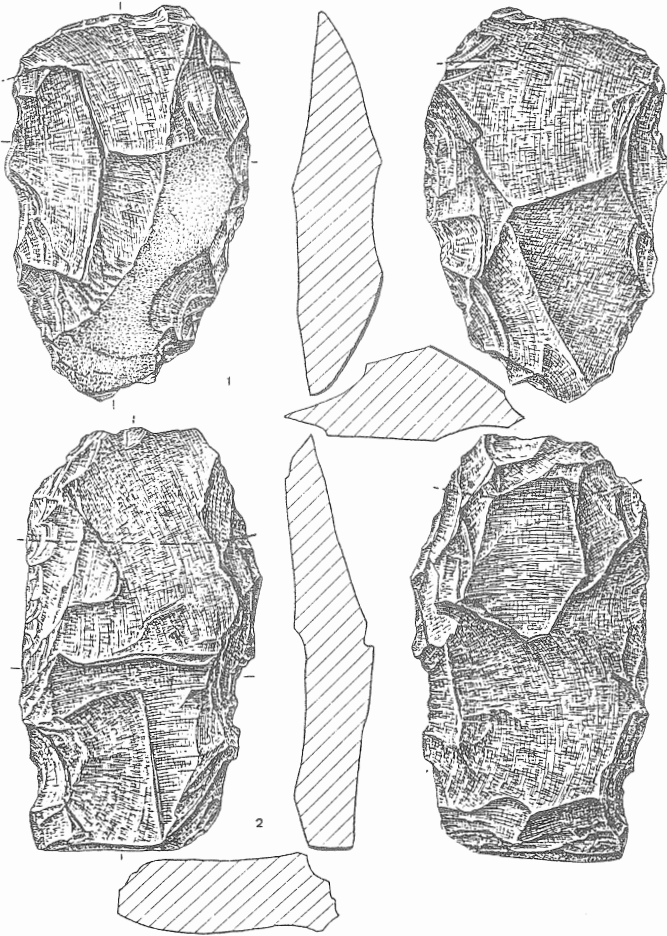


Figure 5: Oval and rectangular adze-like tools with broad distal edges from the Patu site, Rato Khola. Dotted lines mark extents of gloss. 60% natural size.

A special technique of stone fracture has been employed which characterises 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 adzes by shallow step flaking. Often one side was left completely untouched, resulting in flat, unifacial adzes, scrapers and unifaces. On many adzes a gloss is observed on their working edges (delimited by dotted lines in Figure 5), and it is assumed that they had been used for wood, grass and especially bamboo working. Wear analysis by G. Lass (pers. comm.) has verified this.

Several test cuttings have revealed an occupation horizon, some 0.50 to 0.80 m below the red soil surface of the forested 80 m terrace level. On the slopes, where erosion has set in due to the heavy deforestation, the arte-

fact horizon has been exposed and cut away and the artefacts have remained as residue. The slopes are now covered by a concentration of the washed out artefacts. A few C14 dates on charcoal have been obtained and have given a minimum age for the industry of around 7000 BP (Niedersachs. Landesamt für Bodenforschung, Hannover, date no. 15913: 6695±155 BP; 15914: 6865±110 BP; 15915: 7054±110 BP). The charcoal is not from hearths but from burnt wood which may have been brought down by burrowing animals and may be younger than the occupation horizon. The dates are therefore regarded as minimum ages.

The Patu industry is a unique cultural assemblage in Nepal and not found anywhere else in the country so far. It is very different from the lithic tool kits of the prehistoric sites in western Nepal, such as those from Dang-Deokhuri. The adzes have no parallel in the Indian subcontinent, except perhaps in Assam. Behera (1992) reports unifaces in Orissa, though in a Neolithic context. The Patu industry may be regarded as a Hoabinhian-like industry from Nepal.

THE PREHISTORIC SITES OF THE DANG-DEOKHURI AREA.

The other area of investigation is in Dang-Deokhuri District in West Nepal, where we have definite affinities with the Indian cultural traditions. The studied area consists of two tectonically initiated intermontane valleys (Figure 2), the so-called Dun valleys, which have been formed by the faulting and uplifting of the Siwalik foothills of the Himalayas during the last phase of the Himalayan orogeny in the Early Pleistocene. These Dun valleys have been filled with alluvial deposits of lacustrine and fluvial sediments since Middle Pleistocene times (Figure 8). The valleys were filled up to the rim. The rivers draining the valleys must have been blocked by tectonic movements causing this thick alluviation. Later renewed tectonic movements released the rivers and caused deep incision, followed by deposition of black clays and lignites (deposit c in Figure 9) in the innermost valleys. This happened towards the end of the Pleistocene, as we have C14 dates between 13000 and 15000 BP for the lignites (Birbal Sahni Institute, BS 1008: 13270±190 BP for Sitalpur I, upper lignite 1.8 m below surface; BS 1009: 15320±280 BP for Sitalpur 2, lower lignite, 3.3 m below surface).

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

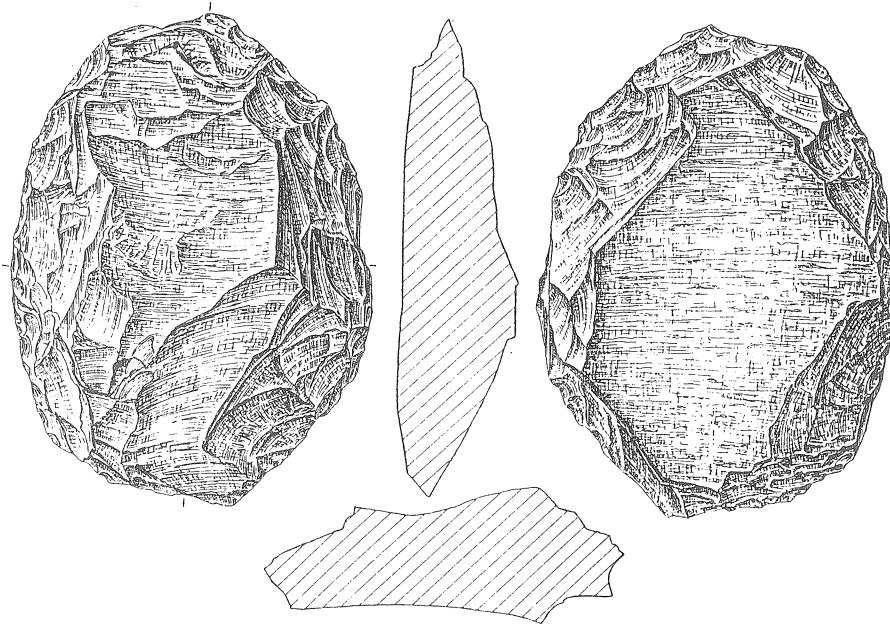


Figure 6: Oval, partly bifacial adze-like tool from the Patu site, made from a flat slice of stone. 60% natural size.

ber of prehistoric sites were discovered and recorded in the Dun valleys and almost all are in stratigraphical association with the Dun valley alluvium. But since nothing was known about the Quaternary history and geology the area had to be studied initially to establish the stratigraphy of the valley fillings (Corvinus 1995) (Table 1).

The oldest sediment fillings of the Dang and Tui Dun valleys are fluvial gravels, which were buried by later deposits and are seen only at places where erosion has cut deep enough for their exposure. In these basal gravels a handaxe industry was found at Gadari in Dang, overlying Siwalik bedrock. The handaxes had eroded out from the gravel. Only a remnant of the basal gravel is left and one large core was still *in situ*.

The handaxes from Dang are made in the Indian tradition (Figure 9). The handaxes and other tools are made of quartzite and have jagged bifacial edges all round. They are made by shallow primary flaking and smaller stepflakes. A large cleaver was found and a number of large cores, hammerstones and flakes. The assemblage is small but quite distinct and is, above all, in stratigraphic position (Corvinus 1990, 1991). In this regard it is significant to note that in spite of the systematic prehistoric survey during the last 6 years which have brought to light an abundance of younger prehistoric sites in Dang-Deokhuri, this is the only site of the early Palaeolithic

period. That means that such sites are rare and that handaxe makers were not frequent occupants of the valleys.

Above the basal gravels a thick succession of mainly lacustrine sediments of stratified clays and silts with occasional gravels of colluvial origin from the neighbouring Siwalik hills have filled the valleys to the rim, forming a 20-30 m high terrace level along the southern flanks of the valley. This infilling must have been induced as a result of the blocking of the river, probably due to tectonic movements along the mountain front (Figure 8, A-C: deposit b). Colluvial, fan-like deposits are observed towards the margins of the valley, where fine clastic hillwash material from the weathered mudstones of the Siwaliks has been deposited. It is probable that these sediments were deposited during a period of drier, cooler climate (Figure 8, A-C: deposit a). Later, in latest Pleistocene times after a period of deep incision, renewed blocking up of the rivers resulted in the deposition of dark clays and lignites in the central part of the valley. Widespread swamps must have then filled the valley and formed the 10m lower terrace. C14 analysis has given us ages of 13000 to 15000 years BP for the lignites, as mentioned above (Figure 8, A-C: deposit c).

Prehistoric inhabitants lived at the margin of the Dun valleys at the foot of the Siwalik slopes, their artefacts being embedded in the colluvial and alluvial deposits (Corvinus 1994). Climatic changes have played an important role in the distribution of traces of occupation in

Table 1: Quaternary stratigraphy of Dang-Deokhuri valleys and associated prehistoric sites.

A. Dang and Tui valleys in western Nepal.

B. Deokhuri valley.

Period	Sedimentary deposits	Associated sites	Sedimentary deposits	Associated sites
Recent	recent flood plain deposits of sand and flood loams	-	recent flood bed deposits of sands and flood loams;	-
Sitalpur Formation	Younger alluvium, of 10m level, with lignites, black and dark grey clays of swamp environment, and sands, reaching below river level. C-14 dates of 3m lignites: 13270+/-190 BP at 1.80m below surface, 15320+/-280 BP, at 3.30m below surface	-	Younger alluvium of sands and silts of 10m elevation above river; lignites and black clays not encountered and uncertain;	-
-----Downcutting-----				
Babai Formation	Older alluvium, upto 25m level above river, with succession of banded clays and silts of lacustrine and fluvial origin and intercalated lenses of colluvial gravels; marginal aeolian(?) or fan-like silts upto 30m; Red soil formation on surface of older alluvium; C-14 date of 17270+/-120 BP from charcoal of flake site in silt 3m below terrace surface at Gadari, Dang.	numerous occupations 1. neolithic in grey top soil, (Holocene)* 2. flake industries and flake-chopper industries in upper levels of banded clay-silts and the marginal fan-like silts; *after end of deposition of older alluvium	Older alluvium of mainly fluvial silts and clays with intercalations of sands and gravels and colluvial gravels, rising upto 30m above river level; marginal unstratified aeolian(?) silts with red soil formation. Contemporaneous are the 30m fluvial terrace deposits of gravels and silts of Arjun R., emerging into the Dun valley. (the upper silts are dated by TL to 10. - 29.5 ka).	numerous occupations: 1. microlithic sites on top surface of yellow silts of the older alluvium, (in Holocene) 2. flake industries and flake-chopper assemblages and a chopper industry in upper levels of alluvium and in red soils of the marginal silts; 3. a flake-blade industry with levallois elements at base of the dated Arjun River silts.
-----Erosion-----				
Basal gravel	about 1 to 2 m fluvial gravel of quartzites and Siwalik sandstone pebbles & cobbles as channel deposit overlying irregularly levelled Siwalik bedrock;	containing a small handaxe assemblage at Gadari/Dang and an industry of huge flakes and cores at Brakuti/Tui.	-	-
-----Unconformity-----				
Siwalik	bedrock of calc. sandstones and mudstones (Lower Siwaliks)		Siwalik bedrock	

the hills. Prehistoric humans seems to have lived here during a very dry period in the later Pleistocene, while in the terminal Pleistocene and early Holocene the climate became wetter and formed swamps with lignites. In modern times the valleys were forested until recently when deforestation changed the vegetation almost into a desert landscape.

CONCLUSION

The chronology and stratigraphic provenances of the various cultural occupations in Dang-Deokhuri and Patu can be described as follows, from older to younger (Table 2):

1. A handaxe industry at Gadari is contained in the oldest deposits in Dang Dun, in basal gravels overlying Siwalik bedrock. These may be of Middle Pleistocene date.
2. A very large flake/core industry at Brakuti West, made of quartzite, is found in basal fluvial cobble gravel below the banded silts in the alluvial valley fill

of the Tui (a tributary of the Dang Dun) (Figure 8, A, below b). The gravel overlies bedrock, as at Gadari, and contains very large flakes and cores and a uni-face.

3. A late Palaeolithic flake-blade industry with prepared, Levallois-like cores and flakes (Figure 10) was found at Arjun 3 in a horizon at the base of an 8 m silt above the fluvial gravels of the 30 m terrace of the Arjun in the Deokhuri Dun valley. It has similarities to later 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 the silt, which are of terminal Pleistocene date.
4. A rather coarse flake industry in association with choppers and core scrapers and some well-made scrapers (Figure 11) is abundantly found in the top part of the marginal colluvial fan deposits and in the top of the banded clay/silt succession of the higher 30

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	West Nepal	East Nepal	Stratigraphic context
H O L O C E N E L A T E P L E I S T O C E N E / / M I D P L E I S T O C E N E	Polished axes, cord-marked pottery (Brakuti, Gadari);		in terrace-top grey soil. Date at Gadari: 1600 BP;
	Microlithic industry (of chert and quartz), no pottery, (Lamahi, Batakund);		in subsurface of 30m terrace in Deokhuri Dun valley;
		Patu industry of adzes and choppers at Patu (Rato R.);	in red soil of 60 to 80m terrace of Rato River; date: 7000 BP;
		Unifacial axes of Chabeni;	alluvial terrace at Siwalik Hill foot;
	Flake industries with or without choppers and corescrapers, made of quartzite, very common; (Gidhiniya, Brakuti, Gadari, Masuria, Lalmatia, Gairakuti etc.);		upper 30m levels of colluvial silts and alluvial 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 30 000 BP.
	Brakuti-West flake site, with large flakes, cores upto 30 cm in size and a uniface;		in basal cobble-boulder gravel below banded silt succession in Tui valley;
	Gadari handaxe industry with handaxes, cleavers, flakes, made of quartzite;		in basal gravel above bedrock below banded clay/silt succession in Dang Dun valley;
	and Satpati site of handaxes;		in folded alluvial sandstones at Himalayan foot, folded by the last Himalayan tectonic events.

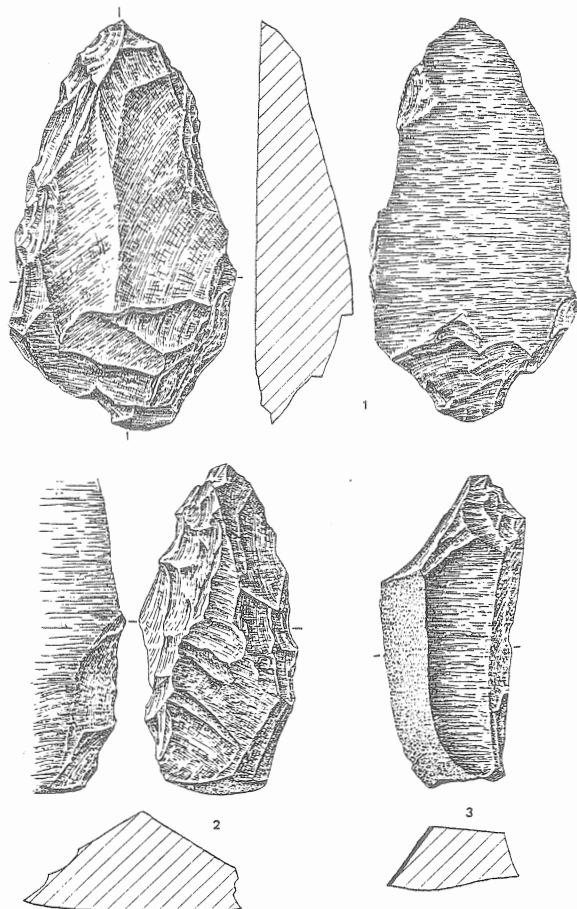


Figure 7: Scrapers from the Patu site made on flakes and flat-based chunks. 60% natural size.

m terrace level of Dang and Tui and Deokhuri. This dates to the terminal Pleistocene.

5. The early Holocene Patu industry with well-made adzes, core scrapers and choppers is recorded from the top of the red soil of the 80 m terrace at Rato Kholā in East Nepal. This industry has no comparisons with any Indian assemblage and seems to have affinities rather with the Southeast Asian Hoabinhian.
6. A microlithic chert industry with small thumbnail scrapers and lunates, similar to microlithic inventories in India, is found at Lamahi and Batakund in Deokhuri Dun in the uppermost horizon of the 30m terrace.
7. Small polished stone axes in association with cord-marked pottery come 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 all of the above sites as no fauna and only little charcoal was found in association

with the artefacts. Thermoluminescence dating has given minimum ages for the top of the 30 m alluvium between 12000 and 32000 BP. (Zoeller, pers. comm.)

The prehistoric sites in the Dang-Deokhuri valleys are endangered by erosion caused by the indiscriminate deforestation in the Dun valleys. This is dissecting the valley fills to such an extent that it will be impossible to save all sites. Much evidence of the prehistoric heritage of Nepal discovered during the last ten years will soon be destroyed. A major part has already been destroyed. Often only last remnants of sites remain while most of the artefacts are washed down the slopes into the badland gullies. If the survey is not continued within the next few years and excavations carried out there will soon be nothing left of the original sites.

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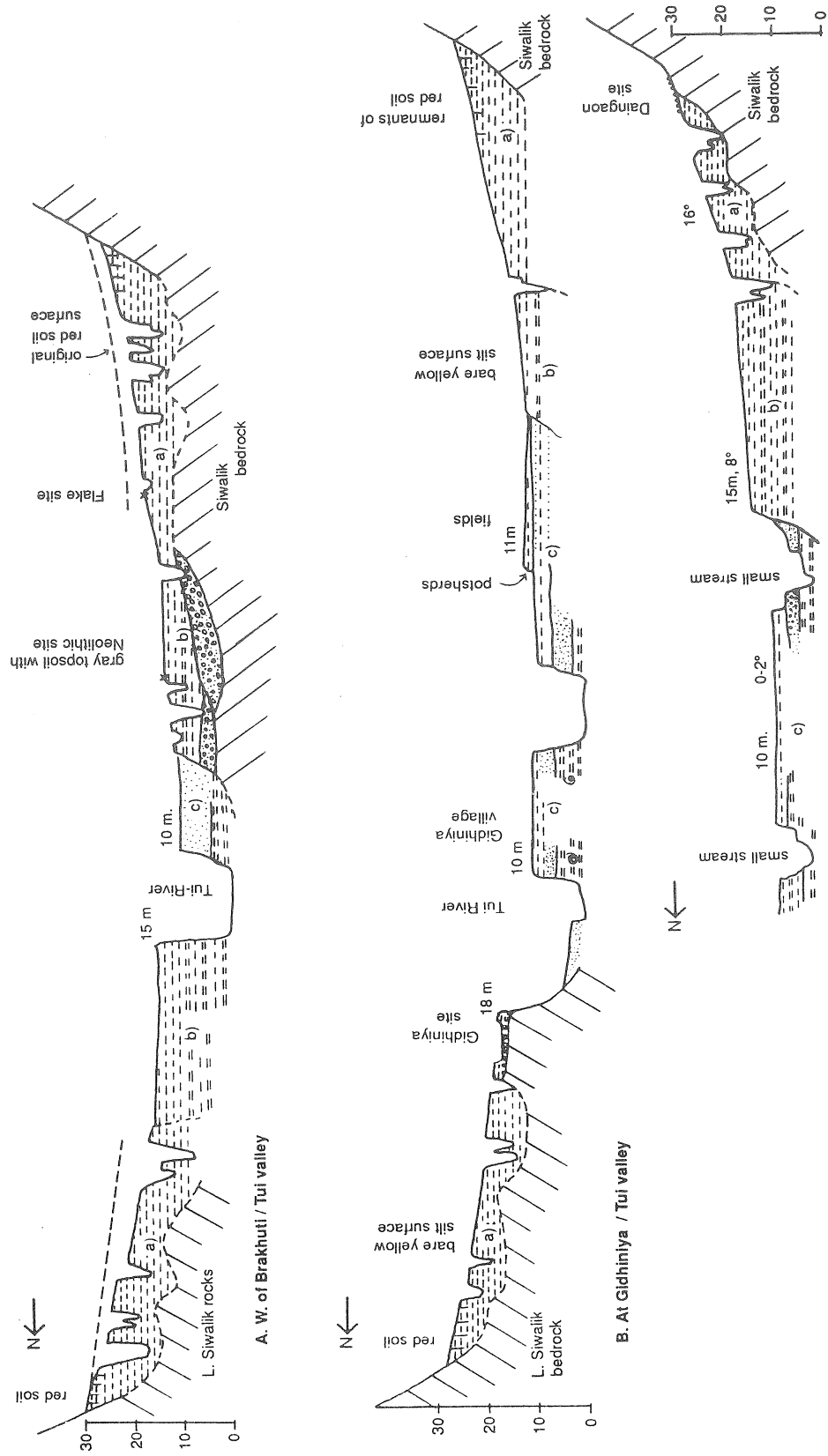


Figure 8: Cross-sections through the Tui valley (A and B) and Dang (C). a) and b) are the older alluvium: a) marginal silts; b) thick clay/silt succession. Both contain prehistoric sites. c) is the youngest 10 m terrace alluvium with black clays and sandy silts but no cultural remains.

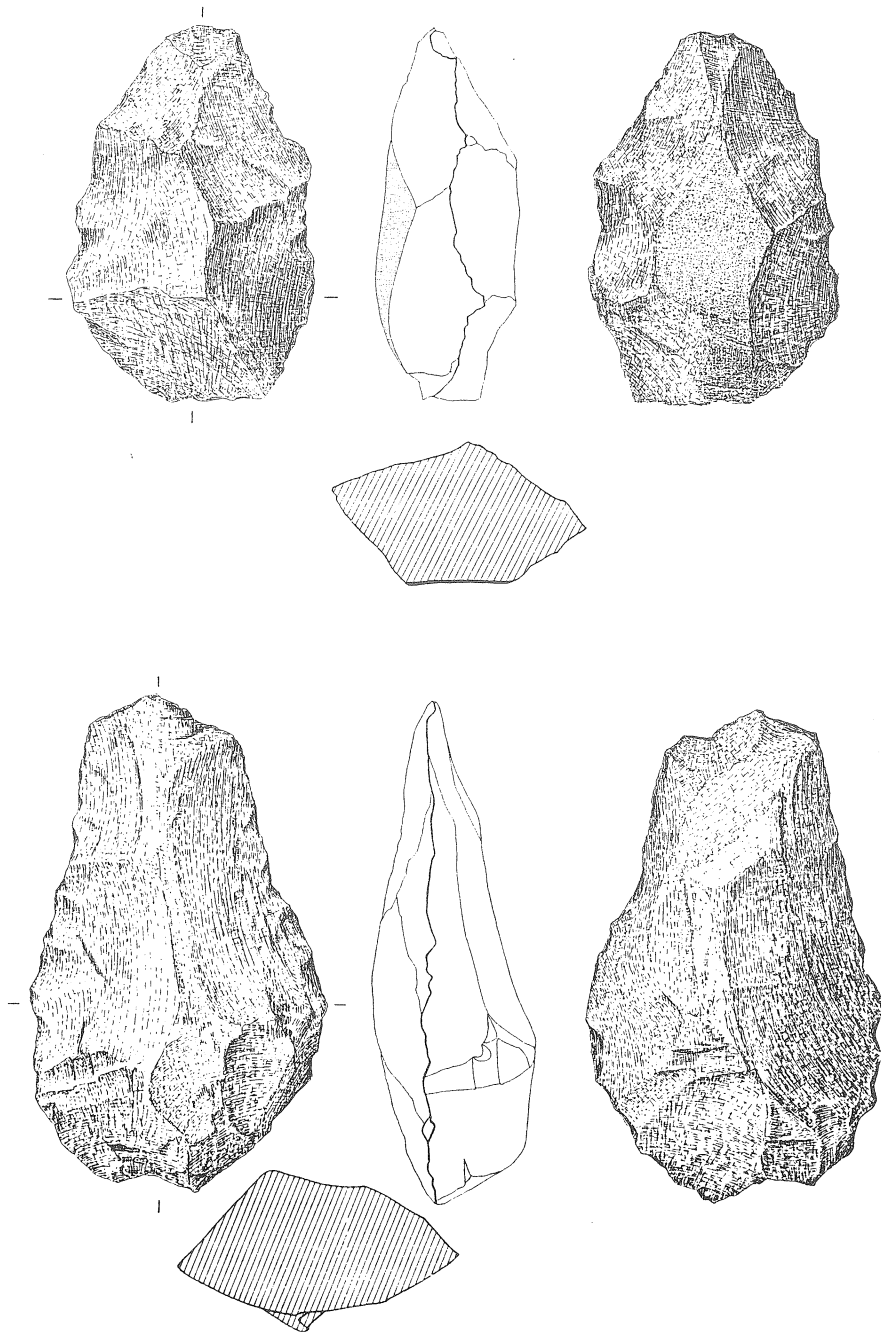


Figure 9: Two handaxes from the Gadari site, opposite Jhaijri (Dang valley). 60% natural size.

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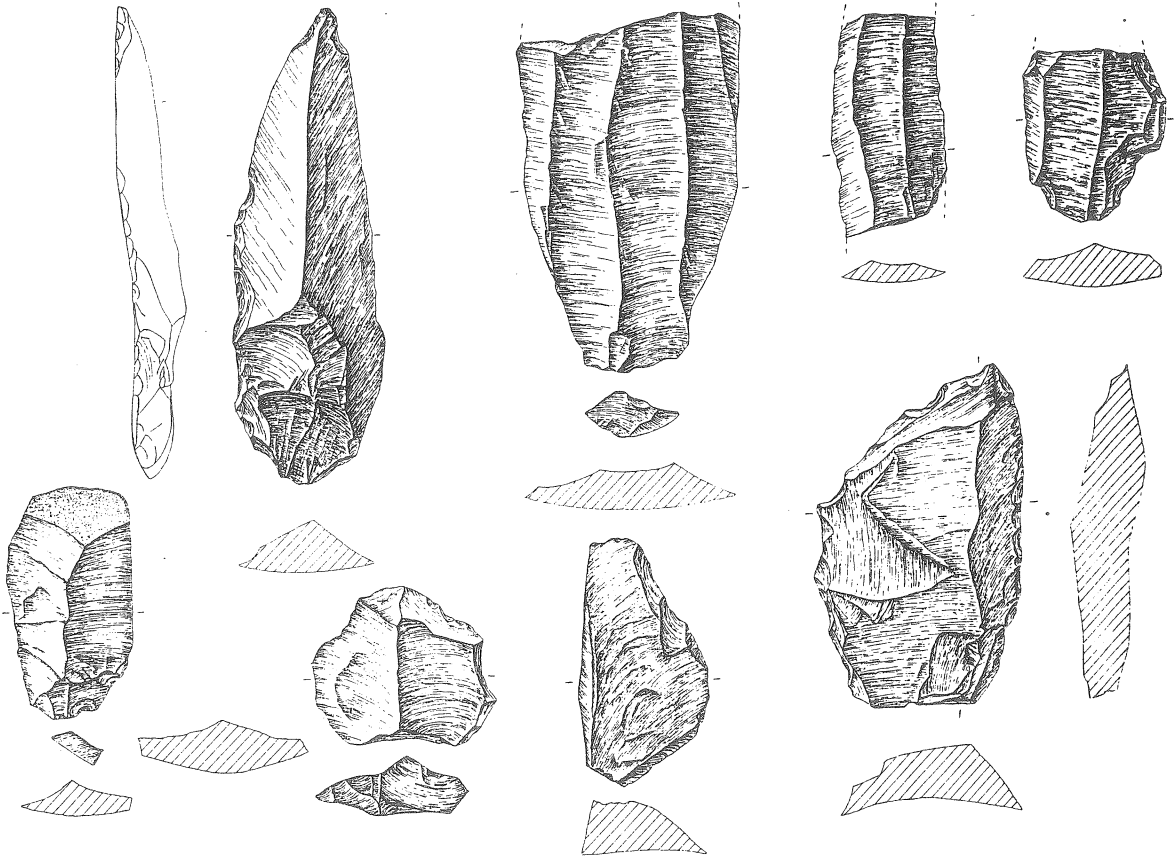


Figure 10: Artefacts from Arjun 3 in the Deokhuri valley. 60% natural size.

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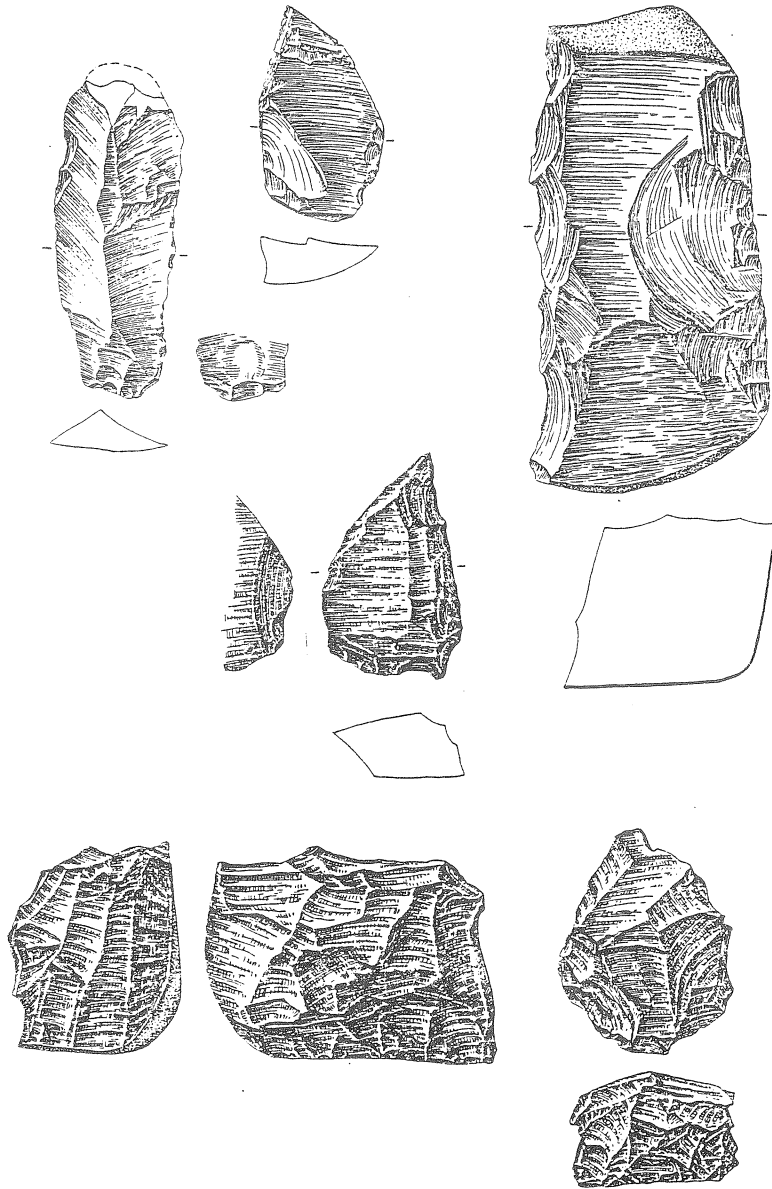


Figure 11: Flakes and choppers from Basantapur and Dolgaon in Dang and from Bhitabang and Gidhiniya in the Tui valley. 60% natural size.