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## DISCOVERY OF RECENT LITHIC INDUSTRIES WITH ARCHAIC FEATURES IN THE HINDU KUSH RANGE (CHITRAL DISTRICT, NORTH PAKISTAN)

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### ABSTRACT

*Survey in the upper reaches of the Yarkhun valley (Chitral district, northern Pakistan), on the southern slopes of the Hindu Kush range, led to the discovery of six sites yielding lithic industries at altitudes between 3000 and 4000 m. These lithic series bear common features. Technologically they appear archaic, for they just consist of coarsely trimmed cobbles or chips collected from close surroundings. The collection, however, satisfies some selection criteria based on shape and raw material (quartz, quartzite, amphibolite, sometimes marble). There is no process of core reduction for producing flakes. Typologically, most of the tools look like axes of various shapes, but with smooth rather than sharp edges; there are also choppers and some smaller tools like notches and end-scrapers with a very particular form of bipolar retouch.*

*According to their geomorphological situation and referring to the chronology established in the neighbouring range of Karakoram, these industries belong to a time period between 8000 and 3000 BP. They are contemporary with the Neolithic and related to a tradition of pebble tools characteristic of the sub-Himalayan belt from the Lower Palaeolithic to the late Neolithic.*

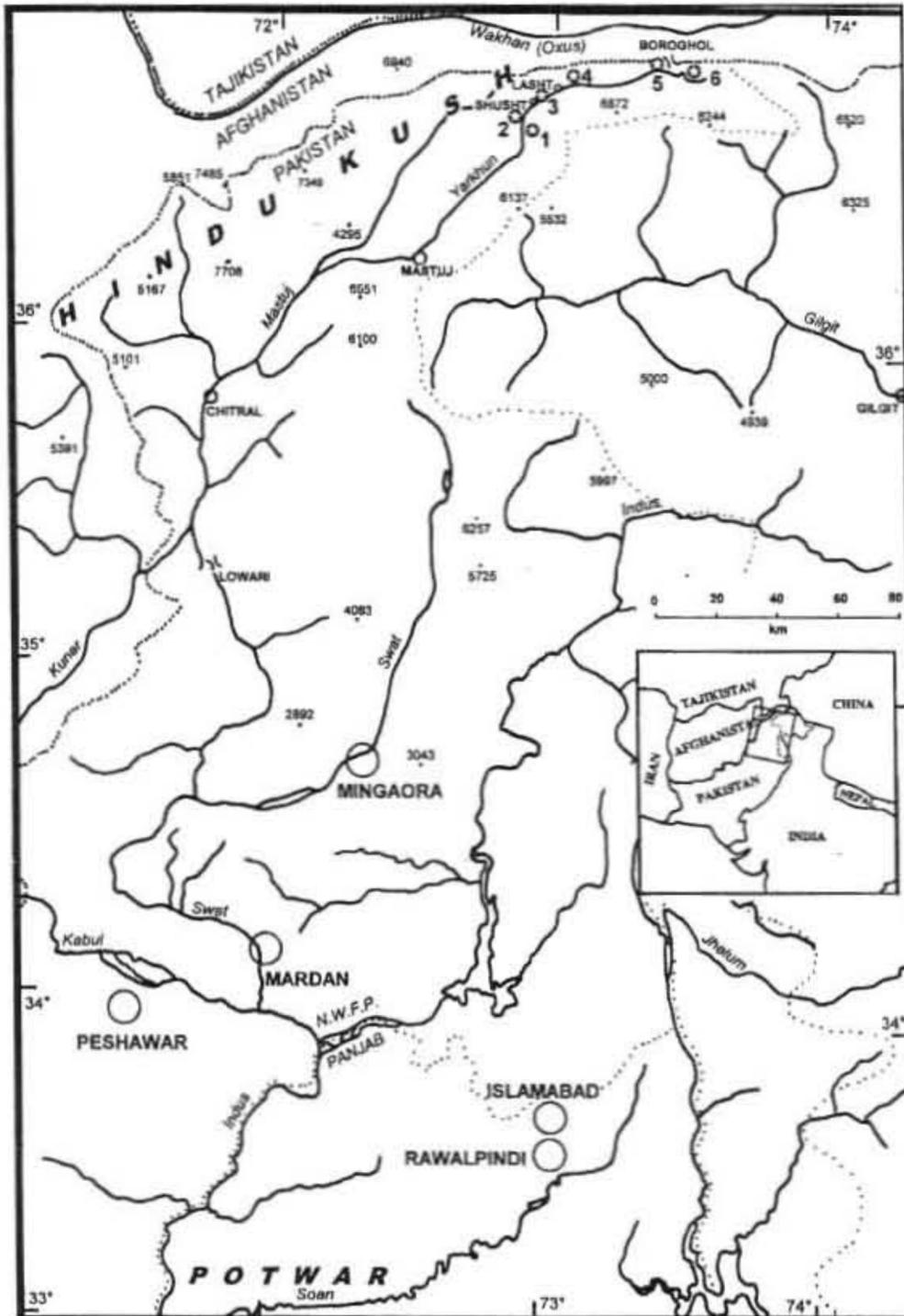
*These new sites in the Hindu Kush, in association to those in the Pamir (Tajikistan), in the Siwaliks (Pakistan, India, Nepal), and maybe further east along the southern fringes of the Himalayas, raise the question of cultural isolation of the mountain populations from the plain populations. At high altitudes, environmental or behavioural factors might have delayed the introduction of technological innovations as well as the neolithisation process.*

The Hindu Kush is the western extension of the Himalayas beyond the Indus valley and it represents the geographical boundary between Central Asia and South Asia. The north-eastern sector of this range includes the highest peaks of Central Asia, but it does not represent a barrier for there are several passes below 5000 m. It is bordered by two important river basins, the Amu Darya in the north and the Indus in the southeast. On both the sides of the Hindu Kush (Figure 1), in the foot hills and the plains, prehistoric remains attest human activity right from the Lower Palaeolithic.

On the southern side of the Hindu Kush, in the Potwar plateau, a few flakes of quartzite are claimed to date to nearly 2 mya (Rendell *et al.* 1989). Handaxes appear between 0.7 and 0.4 mya in the Jhelum valley, testifying an Acheulian tradition (Rendell and Dennell 1985). The Soanian lithic industry, devoid of any handaxes and very rich in cobble tools, is common on the river terraces in the Siwaliks hill range. Although never precisely dated, it is considered as a technological facies of the Lower Palaeolithic, but may also encompass later cultural periods, even into the Neolithic.

On the northern side of the Hindu Kush, in Tajikistan, the sites of Karatau I and Lakhuti I have yielded lithic industries mostly composed of cobble tools and flakes, without handaxes, recalling the Soanian. The age of these industries is between 150 and 200 kya (Ranov and Davis 1979; Davis, Ranov and Dodonov 1980).

The Middle Palaeolithic is well represented in Central and South Asia, but in the Indus basin it seems to be rare. One of the most important sites is Sanghao Cave (Dani 1964, Ranere 1982), where the earliest levels date to around 50 kya (Farid Khan and Gowlett 1997). However, some of the Soanian sites in the Potwar plateau (De Terra and Paterson 1939) may correspond to the Middle Palaeolithic.



1: Nakht Sir Dem; 2: Shusht; 3: Lasht-Savaliar; 4: Zeshtsh-o-Gutsh; 5: Boroghhol-Chilmarâbâd, 6: Thinioupk.

Figure 1: Location map of Hindu Kush and sites in the Yarkhun valley.

Typical Upper Palaeolithic, similar to the facies known in western Eurasia, occurs only in the northern foothills of the Hindu Kush and seems to be absent on the southern side. Sites representing this cultural period are few, maybe due to the cold and dry climate at this time. Kara Kamar, in Afghanistan, is one of the best witnesses for a well-mastered blade technology (Davis 1978), dating between 35 and 25 kya (Coon and Ralph 1955).

Flanking the Indus basin, the Potwar plateau has yielded, at "site 55" near Riwayat, a lithic industry assigned to the Upper Palaeolithic, or to a transitional phase between the Middle and Upper Palaeolithic, dated to more than 45 kya (Rendell and Dennell 1987). According to published photographs and drawings, that reveal that the assemblage

comprises more flakes than blades, this assemblage resembles the Sanghao industry. It is quite possible that both Riwayat 55 and Sanghao represent a transitional phase between the Middle and Upper Palaeolithic, at about 50 kya.

In the Himalaya mountains proper there is only scarce evidence of prehistoric human activity. Of course, the extreme climatic conditions are not in favour of human occupation, nor in favour of good preservation. But in Tajikistan, and especially in the Pamir, prehistoric sites are found at high altitudes. They are contemporary with the Mesolithic and Neolithic of the lower altitudes, but the lithic industries remain rich in cobble tools recalling the Soanian tradition. These sites belong to the Markansu and Hissar cultures (Gupta 1979; Ranov 1993).

The question is to know whether this tradition is confined to the mountains and surrounding areas, as suggested by some prehistorians (Ranov 1993). Is it only confined to the Pamir? Or has it some extensions in neighbouring mountain regions, like the Hindu Kush for instance? Is it related to the Soanian of the Siwaliks? In order to try to answer some of these questions, the northeastern part of the Hindu Kush was surveyed, in the district of Chitral (Figure 1), as representing one of the mountainous regions located in between the Pamir and the Siwaliks.

#### THE MOUNTAIN LITHIC TRADITION DURING THE EARLY HOLOCENE – THE MARKANSU AND HISSAR CULTURES

At the end of the Palaeolithic and preceding the Neolithic, there are two technical traditions in Central Asia. On the one hand, the Mesolithic is characterised by the presence of geometric microliths and seems to have spread from southwestern Asia. On the other hand, the Epipalaeolithic is devoid of any geometric microliths and appears as the result of *in situ* evolution of the local late Palaeolithic.

Among the sites yielding Epipalaeolithic material, there is a group of localities which are remarkable for their setting at very high altitudes (more than 4000 m) in the Markansu valley of Pamir. They are open air sites, with or without hearths, where the industry is associated with wild fauna. The artefacts are made of varied rock types and include small blades made of selected flint, end and side scrapers, arrowheads, many core tools and a good number of cobble tools. This particular tradition is dated to  $7580 \pm 130$  and  $5145 \pm 120$  BP in the site of Oshkhona (Ranov 1988, 1993).

Younger prehistoric lithic remains are unknown in the Pamir at this high altitude, but they are well represented slightly below, in the mountainous region of southern

Tajikistan, in the form of a particular tradition contemporary with the Neolithic. This tradition, discovered in the 1960s by Okladnikov in the Hissar valley and characterised by cobble tools, may be linked to the Markansu tradition. The sites appear to be associated with a specific environment in that they usually occur on the lower terraces (20 to 30 m) of the rivers, at altitudes ranging from 700 to 1500 m, and they are surrounded by mountains. They have a rich fauna and flora of Palaeoarctic affinity, nowadays found in the Himalayas between 1800 and 2000 m (Amosova *et al.* 1993). The lithic assemblages include a large variety of rocks, usually of poor quality, and tools on cobble are numerous. However, flint is also used and sometimes collected from afar for better quality; in such cases the knapping technology is well-mastered and produces flakes and small blades, the latter sometimes retouched by pressure. Polished axes are also present. There is no pottery, but a few ornaments of bone have been found.

The sites are mostly in the open and hearths are not common. It is not known if these people were nomadic, but animal bones include domesticated as well as wild animals, attesting both cattle breeding and hunting. In the early phases of the Hissar tradition, cultivation was probably unknown, but grinders and pestles increase in number in the later phases, suggesting increasing consumption of grains (Amosova *et al.* 1993).

#### THE DIRECTION OF RESEARCH

We may ask if there is any chronological and technological continuity between the Palaeolithic Soanian on the one hand, and the Mesolithic and Neolithic cultures of Markansu and Hissar on the other. Or are the similarities between these industries simply a matter of convergent adaptation rather than cultural continuity? In order to examine these questions our research focused on the mountainous region of Northern Pakistan, and particularly on the southern slopes of the Hindu Kush range in the district of Chitral (Figure 1). The survey of the Yarkhun valley was conducted by the Pakistan-French Archaeological Mission, a collaboration between the Laboratoire de Préhistoire du Muséum National d'Histoire Naturelle, Paris, the Department of Archaeology and Museums, Government of Pakistan, and the Department of Archaeology of the University of Peshawar. It was funded by the French Ministry of Foreign Affairs.

During summers 1996 and 1997, the Yarkhun valley was surveyed and six sites were discovered in the sector of Shusht, Lasht and Boroghol, in the upper reaches of the river. This area is on the southern slopes of the north-eastern region of Hindu Kush, between 3000 and 4000 m in altitude. Valleys are deeply cut by glaciers and rivers. The main valley is moderately broad, and upstream near Boroghol the landscape is more open. The geology consists of meta-

morphic series including mainly marble, quartzite, micaschist, schist, gneiss and amphibolite, but all these rocks do not occur together at any given spot. In some places, screes of quartzite cover the slopes of the valley, stretching for several kilometres. Among the angular fragments of these screes it is so far impossible to identify any artefacts. The vegetation is of subalpine and alpine type, characterised by grassland (alpine meadow) on the slopes and plateaux, with only a few trees in the bottoms of the valleys (poplars, willows and birches). The fauna is quite rich and diversified.

Sites are usually found on the river terraces, 10 to 25 m above the present river bed and about 400-1000 m away from it. All the sites are open and yield only a lithic industry (Figures 2-8). There are neither organic remains, hearths, nor settlement structures of any type. From downstream to upstream along the Yarkhun river, six sites have been identified (Figure 1):

1. Nakht Sir Dem (NAK). About 3 km downstream from Shusht, on the left bank of the Yarkhun, the 10 m terrace makes a cliff along the river. A shallow but broad shelter is cut into the cliff and the fan deposit resulting from this erosional process yielded a few artefacts.
2. Shusht (SHT). On the right bank of the Yarkhun, between the bridge and the village, a tributary (nowadays just a rivulet, due to irrigation) has accumulated a large deposit of pebbles and cobbles. On this gravel a few artefacts were picked up. It is quite probable that they had come from somewhere upstream.
3. Lasht-Savalior (SAV). At Lasht itself, while walking down from the cantonment to the river, one can collect artefacts scattered on the gently sloping surface of what seems to be a terrace, between 15 to 20 m above the river bed. Just along the river and in the gullies nearby, the eroding gravel of the upper part of the 5 m terrace also yields artefacts, often slightly rolled.
4. Zeshtsh-o-Gutsh (ZTG). Altitude 3350 m. About 3 km upstream from Lasht, on the right bank, there is a place with a forest of poplars and willows. About 400 m from the stream, many artefacts were collected in an area of 50 x 30 m. They were resting on the 10 m terrace, a loose cobble deposit composed of various types of rock. A small trial pit showed that the alluvial deposit is homogenous to the depth of one meter. It is an unsorted loose cobbly gravel in a sandy matrix, in which the elements vary in size from 1 to 30 cm. The bigger cobbles (20 to 30 cm) are usually of granite or gneiss; the smaller ones are also of schist. The raw material used for making the lithic industry is cobbles of amphibolite measuring more than 10 cm.
5. Boroghol-Chilmarâbâd (BOR). Altitude 3650 m. On the right bank of the Yarkhun, near the small hamlet of Chilmarâbâd, several terraces can be distinguished at about 30 m,

20 m, 10 m and 5 m. They are cultivated in places and the big stones are gathered around the fields. The deposits constituting these terraces include blocks of sandstone, limestone, granite, a greenish microcrystalline rock, and some quartzite (10 %). Only quartzite blocks were struck. They occur in the erosional slopes of the 10 m and 20 m terraces and on the surface of the 20 m terrace. Apparently, they are absent on the 5 m terrace. It is possible that all of them are eroded from the 20 m terrace, and if so, this original situation may indicate their minimum age.

6. Thiniupk (THI). Altitude 3900 m. At about 1 km from the small lake of Thiniupk, a small pan-like zone, partly humid, partly covered with dried mud, seems to be a seasonal pond. On one of the slopes above, at less than 300 m, some artefacts of quartzite occur. They do not belong to the lithological context, which is mostly composed of rounded slabs of limestone and schist fallen down from a small cliff above, within a yellow silt. Some nodules may have come from a small seasonal stream 100 m away, but well rounded cobbles of quartzite were probably brought from the Yarkhun river about 1 km away.

#### CHRONOLOGY

It is difficult to assign an age to the lithic artefacts of the Yarkhun valley, since they are usually lying on the surface and are not associated with datable materials. The only chronological reference is the Quaternary geomorphology of this high altitude region. When the valley is broad enough, between two and four terraces can be observed along the river and in some places these are directly related to glacial moraines. Detailed studies of moraines were conducted during the 1980s in the Karakorum, which is the same mountain range as the Hindu Kush but on the other side of the Indus (eastern side). These studies indicated that one of the most significant characters for determining age is the intensity of the brown patina on the blocks of crystalline rock. This patina, known as "desert varnish", is linked to semi-arid conditions in periglacial environment.

The darkest and unweathered desert varnish belongs to what is called the Batura glacial stage in the Hunza valley (Karakoram), considered early to middle Holocene (Derbyshire *et al.* 1984). If referred to the palynological chronology of Northern Europe and to palaeotemperatures in Greenland ice cores, this stage may correspond to the end of the Boreal phase, progressively warmer but rather dry, around 8000 BP.

All along the Yarkhun, in the sector of Shusht and Lasht, the alluvium shows a conspicuous level rich in boulders (30 to 50 cm) bearing a dark brown patina. This brown level usually lies close to the present water level. At the site of Zeshtsh-o-Gutsht it is well exposed on the bank and appears as a real boulder conglomerate hardened by cementation of

the sandy matrix. Tentatively, this level may be related to the brown moraine of the Batura glacial stage. This brown level is usually covered by a loose grey gravel, devoid of any large boulders, in which the cobbles are not patinated. If this loose cobbly gravel results from climatic factors and not from tectonic events, it may be assigned to the end of the temperate and humid Atlantic phase (7500 to 4800 BP). It should be mentioned that in east China the Mid-Holocene (around 6000 BP) is considered a slightly warmer climatic phase in middle and high altitudes (Wang and Wang 1980).

At Zeshtsh-o-Gutsht the lithic artefacts are resting on this upper gravel and do not occur within it. Therefore they must have been dropped at the end or after the formation of this loose alluvium, which is resting on an early or middle Holocene brown conglomerate. So, the artefacts at the top of the loose alluvium cannot be earlier than the end of the middle Holocene, and may be late Holocene. They may be contemporaneous with the slight climatic warming at the end of the Subboreal phase, around 2700 BP, or they may be older and date to the end of the Atlantic phase.

#### THE LITHIC ARTEFACTS

The southern slopes of the Hindu Kush are mostly of metamorphic rocks, among which gneiss, schist and mica-schist are the most important. In the study area quartzite is not common, except in Boroghol, but marble and amphibolite are well represented. It is interesting to note that most of the tools collected (80 %) are of amphibolite, a black, rather hard and homogenous rock. Only in the upper reaches of the Yarkhun, at Boroghol and Thiniupk, is quartzite preferred. There are also a few tools of marble, especially at Shusht. Crystalline rocks like gneiss are apparently not used.

Small tools, particularly cutting tools, are rare in these series and one can wonder whether there were none at all or whether they were made in other raw materials, like schist or wood or even, who knows, iron. Any of the natural flakes of schist which are in plenty everywhere could have been used as ephemeral cutting tools, taken on the spot and then discarded. But it is impossible to identify them for use marks are not preserved and even the fragments themselves are quickly destroyed.

At ZTG, many of the tools (56 %) are on cobbles or pebbles and most of the cobbles are flat. But at SAV there is only one tool on a broken cobble, all others are made on different types of blanks, especially flakes and small slabs. Blocks, usually abraded, are conspicuous at THI (8/18) and also at SAV (5/23), but small abraded slabs are the preferred blanks in most cases, except in the upper reaches of the Yarkhun, where tools on cobbles are more common (4/7 at BOR, 5/18 at THI). The shaping of the tools is very light and does not modify much the original morphology of the blanks. Therefore, selection of the blanks according to their shape

and lithology was the most significant action in determining the features of these assemblages.

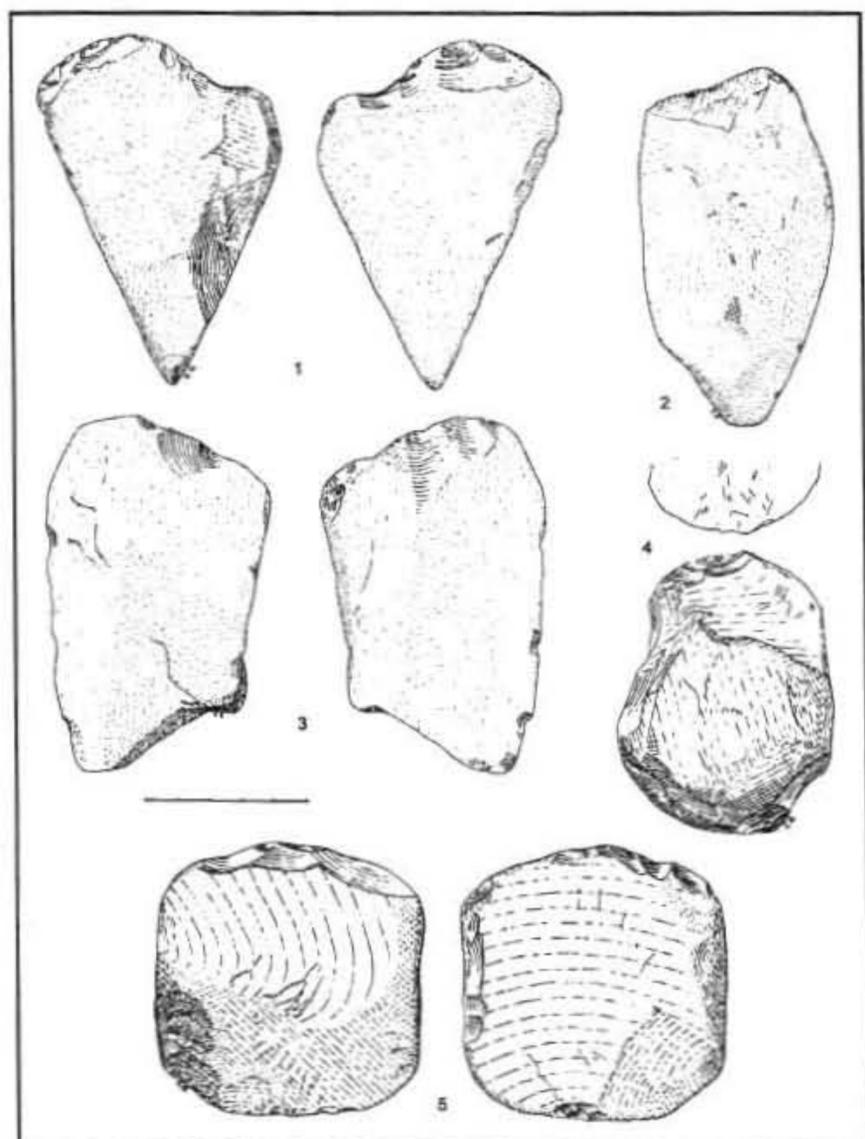
In terms of tool types, there are a few standard morphologies occurring several times and in different sites. Most deserve the name of axe or adze. The triangular outline is the most striking one of the three sides is a large convex edge, opposite the angle formed by the other two sides (Figures 2-1, 3-2, 4-1, 4-2). Another outline shows parallel sides and the edge may be single or double (single Figures 2-4, 2-3; double Figures 2-5, 3-1, 6-1). It is interesting to note that these tools have some similarities with some Neolithic axes found in Central Africa, for instance. In some cases the lateral sides are concave, either naturally or due to a large flake scar (Figures 3-3, and, to some extent, 2-1). These tools recall one type occurring in the Aceramic Neolithic of Kashmir. It is known as a "waisted tool" and shows convex edges at both ends and notched sides shaped by pecking.

Besides the previous types, which are basically axes with rather flat morphologies, there are tools with very thick butts. These are either elongated, with the edge at the

broader end (Figures 2-2, 5-4), or nearly circular with a wide edge (Figures 4-1, 6-3). There are a few choppers and chopping tools, characterised by large, deep flake scars (Figures 5-4, 6-1, 6-2, 8-6), some with concave and very steep edges (Figures 5-2, 5-3; 5-1 composite). Other tools are hardly trimmed and look rather like utilised blanks, showing some chipping on the natural edges (Figure 7-4), picking and slight polishing on the ridges and faces.

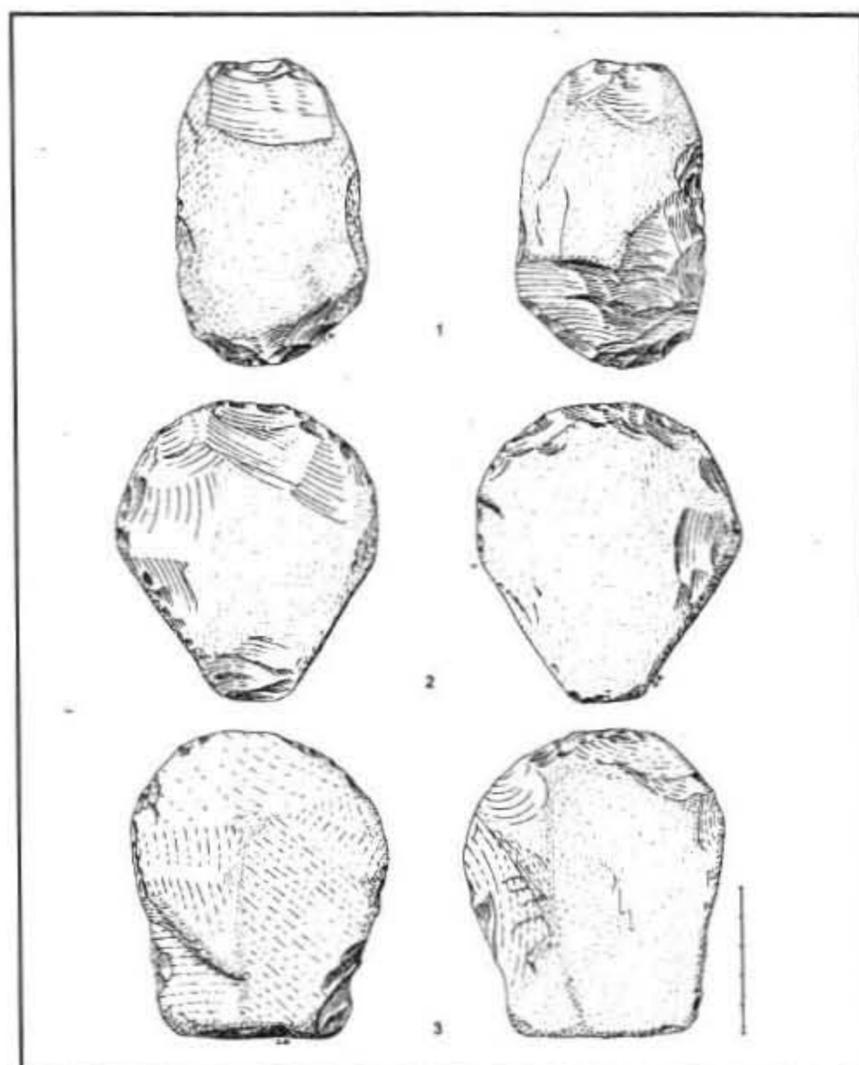
The distribution of the various tool types shows some differences between sites. In the upper reaches of the Yarkhun, at Boroghul and Thiniupk, choppers and chopping tools with rounded shapes are most common. This seems to relate to shapes of the blanks: quartzite cobbles are available in plenty upstream and rare downstream, where they are replaced by cobbles of crystalline rocks (gneiss and schist) and chunks of local amphibolite. Even the type of retouch applied to these different blanks is linked to the structure of the rock, and it is difficult to make any culturally meaningful comparisons between the series.

Small tools are mostly simple forms such as scrapers and notches. Scrapers result from continuous retouch along an edge, either side or end (Figures 7 and 8). Notches are



1: convex edge opposite to narrow butt; 2: end chopper on elongated blank; 3, 4, 5: convex edge on flat blank with parallel edges, either simple (3 end 4) or double (5). Scale in cm.

Figure 2: Lithic industry from the Yarkhun valley.



1: convex edge, double, on flat blank with parallel edges; 2: convex edge opposite to narrow butt; 3: convex edge adjacent to concave edges. Scale in cm.

Figure 3: Lithic industry from the Yarkhun valley.

obtained by a single stroke, but the concavity bears small retouch, maybe intentional or due to utilisation (Figures 7-1, 7-2).

*The shaping of the tools*

Except for the chopper and chopping tool types, there is no actual flaking of the edges in the sense it is understood in the Palaeolithic, for instance, where the strokes are usually applied near the edge of two joining faces making an acute angle (less than 90°). On the tools from the Yarkhun valley, it seems that the flake removals result from strokes applied not on a face, close to the edge, but directly on the edge itself. The scars are usually parallel to the original surface of the blank and show steep hinges. Most flake scars are short, just limited to the edge, but sometimes, especially when the rock is slightly schistose, they can be very large and make the tool thinner than the original blank (Figs. 2-4, 3-1).

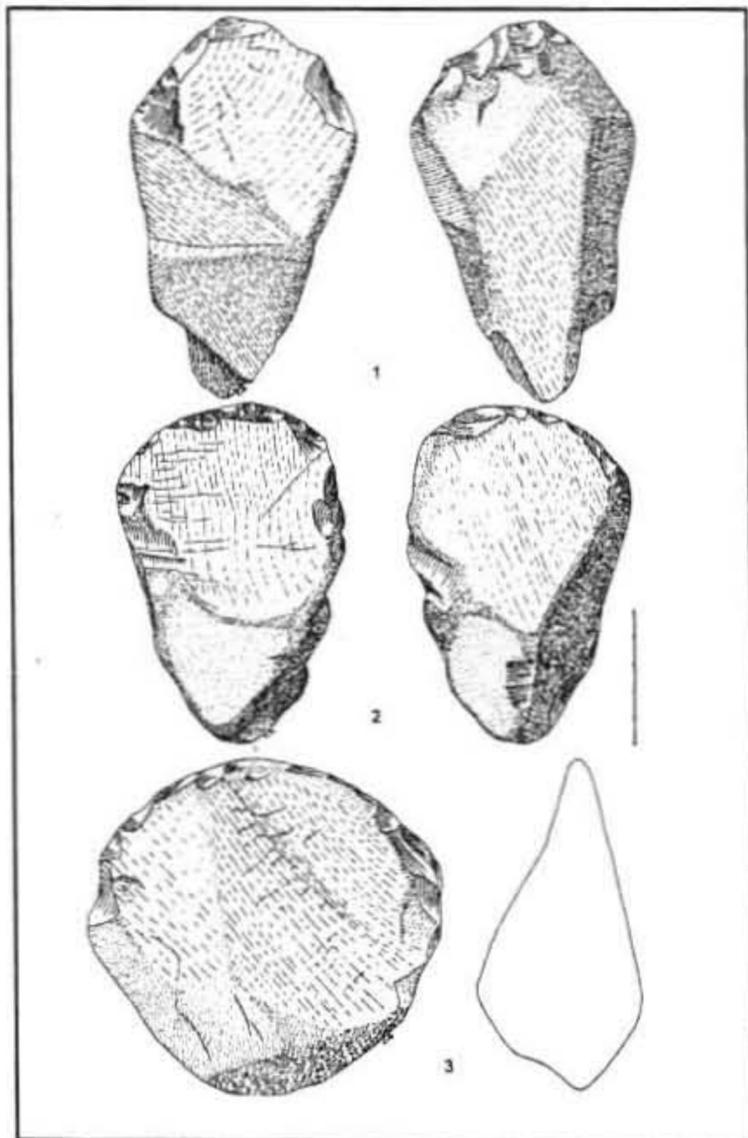
This method of flaking need not be practised with a hammerstone but simply by striking the blank itself on a fixed anvil. This method can be observed nowadays among

the local people. If so, the action of shaping the tool can be the same as that of using it, which makes it more difficult to understand the human intention behind the artefacts themselves.

Among the small tools, the steep scrapers (end scrapers) show a specific technological feature in that most are shaped by bipolar retouch. This is conspicuous on the end scrapers at ZTG as well as at THI, and it also occurs on some of the steep choppers ("rabot"; Figure 8-4).

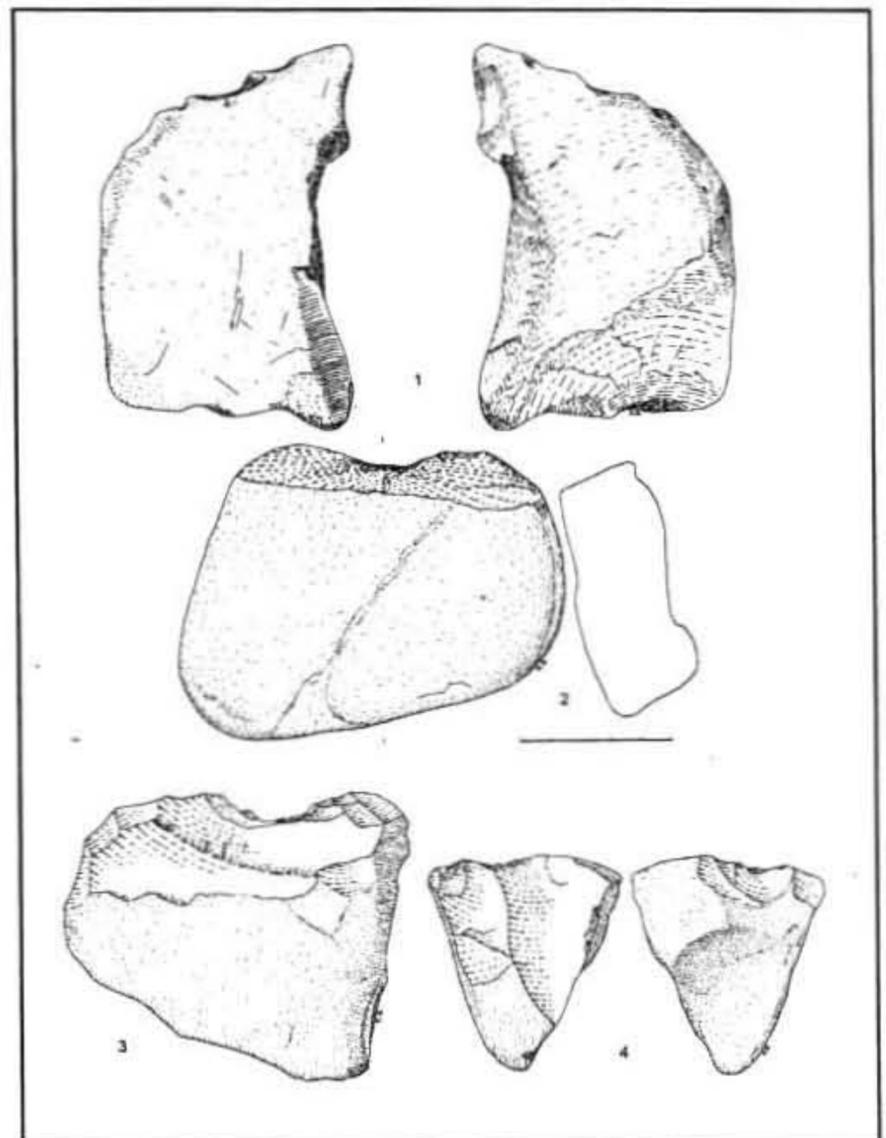
*Use marks*

Apart from chipping of the edges, which may be intentional or incidental, all the tools show picking, abrasion or polish. These marks occur either on the edges or on ridges, and also on the faces. Strong polish, to such a grade that small glossy patches (2 mm) appear on prominent zones on either of the faces, suggest that some tools might have been fixed to a shaft or handle. But this is only a hypothesis and it requires experiment for confirmation.



1, 2: convex edge opposite to thick and narrow butt; 3: large convex blunted edge opposite to thick butt. Scale in cm.

Figure 4: Lithic industry from the Yarkhun valley.



1: multiple tool (concave steep chopper, notch, hammer); 2, 3: concave steep chopper; 4: chopping tool with utilised sides. Scale in cm.

Figure 5: Lithic industry from the Yarkhun valley.

DISCUSSION

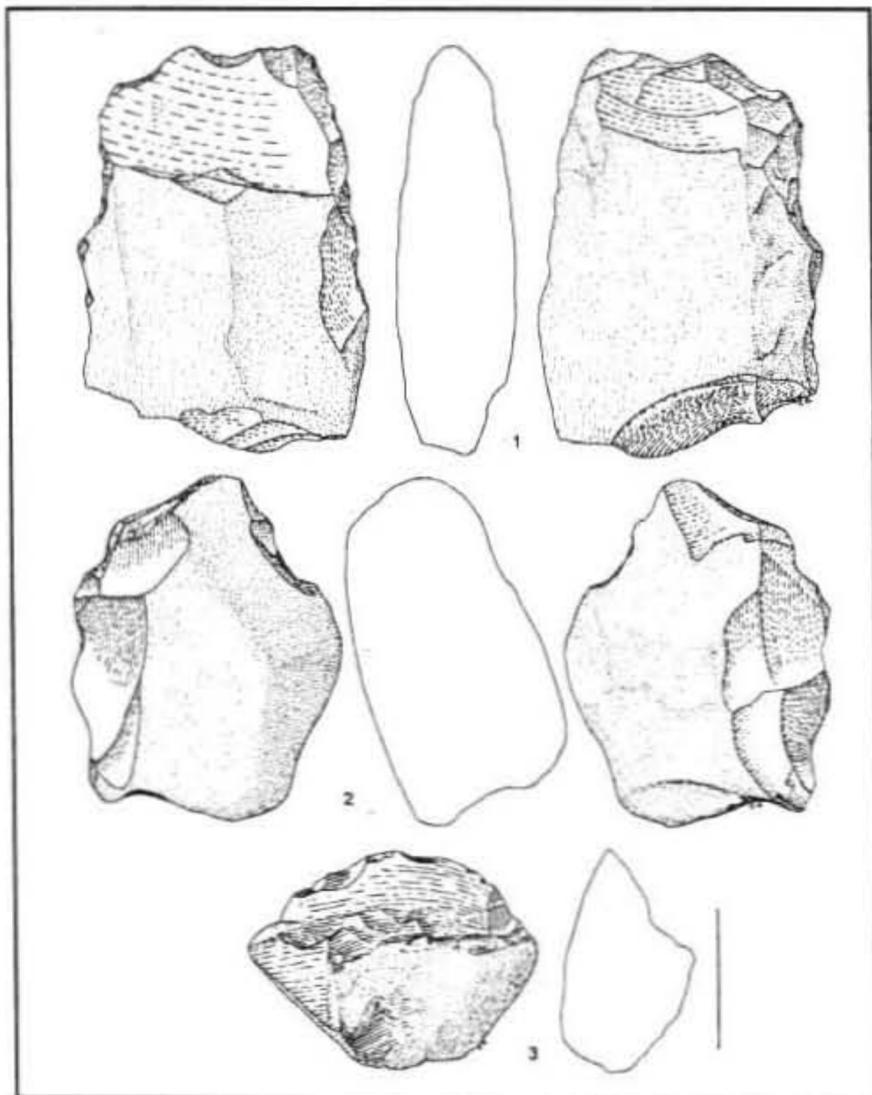
The tools collected in the upper reaches of the Yarkhun valley, in the sector of Shusht and Lasht, obviously display common features. Their shape is sometimes very regular, although the amount of work applied to the blanks is usually limited. The same morphological types occur in different sites suggesting, that they were intentionally made or at least deliberately selected and used.

If there is no doubt about the human origin of these artefacts, there is a question about the antiquity of people responsible for their use. At ZTG the artefacts are resting on the surface and not within a loose pebbly gravel accumulated during the Mid-Holocene, so they could date between 5000 and 2700 BP. At any rate, precise datation would help a lot in understanding the human occupation of this high altitude zone.

The most striking technological feature of these industries is that the tools are very coarsely trimmed and they result from a very small amount of work. The shapes of the blanks are still the shapes of the resulting tools. Such a simple technology recalls that of the Palaeolithic Soanian industries. It also has some similarities with the Markansu

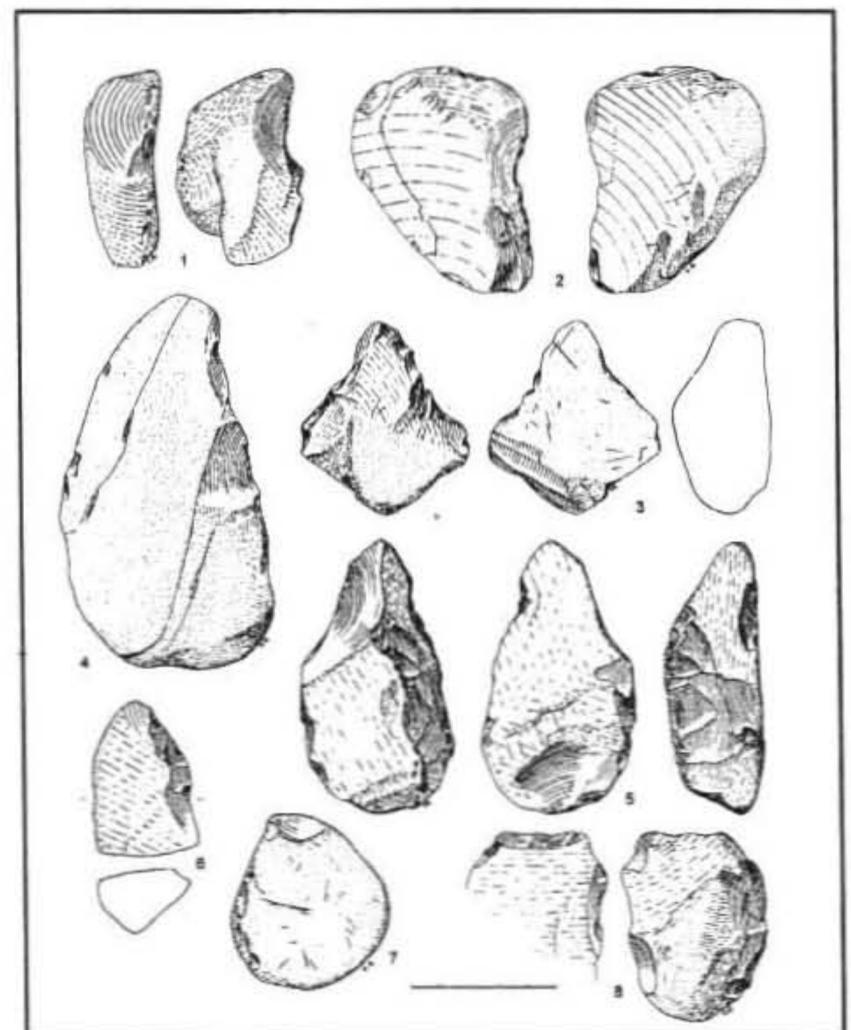
assemblages present in the Pamir, at high altitudes, during the Mesolithic and Neolithic periods. Some features are comparable to the Aceramic Neolithic of Kashmir and the Neolithic of Nepal.

This discovery is all the more interesting for it is not isolated. In the same period similar coarsely worked industries, without pottery, are known in neighbouring regions. In Kashmir, for instance, in the valley of Srinagar, many surface sites along the rivers yield large tools made from basalt cobbles, split into two parts and roughly trimmed. Although they are not precisely dated, these artefacts are related to the Aceramic Neolithic culture identified at Burzahom in the early third millenium BC (Pant *et al.* 1982). In Eastern Nepal, in the Rato Khola area, the Patu sites yield an industry very similar to that of the Yarkhun. However, the altitude is lower than in the sector of Shusht, Lasht and Boroghol. Radiocarbon dates give a minimum age of 7000 BP for this material (Corvinus 1987, 1989, 1996). Noteworthy, some components of this industry recall the "sumatraliths" of the Hoabhinian culture of Southeast Asia, but such tools were not found in the Yarkhun valley. In Pamir, the Mesolithic Markansu industry includes many tools on cobbles (Ranov 1988, 1993), but they are associated with smaller tools, which



1: multiple chopping tool; 2: denticulated chopping tool; 3: large convex edge opposite to thick butt. Scale in cm.

Figure 6: Lithic industry from the Yarkhun valley.



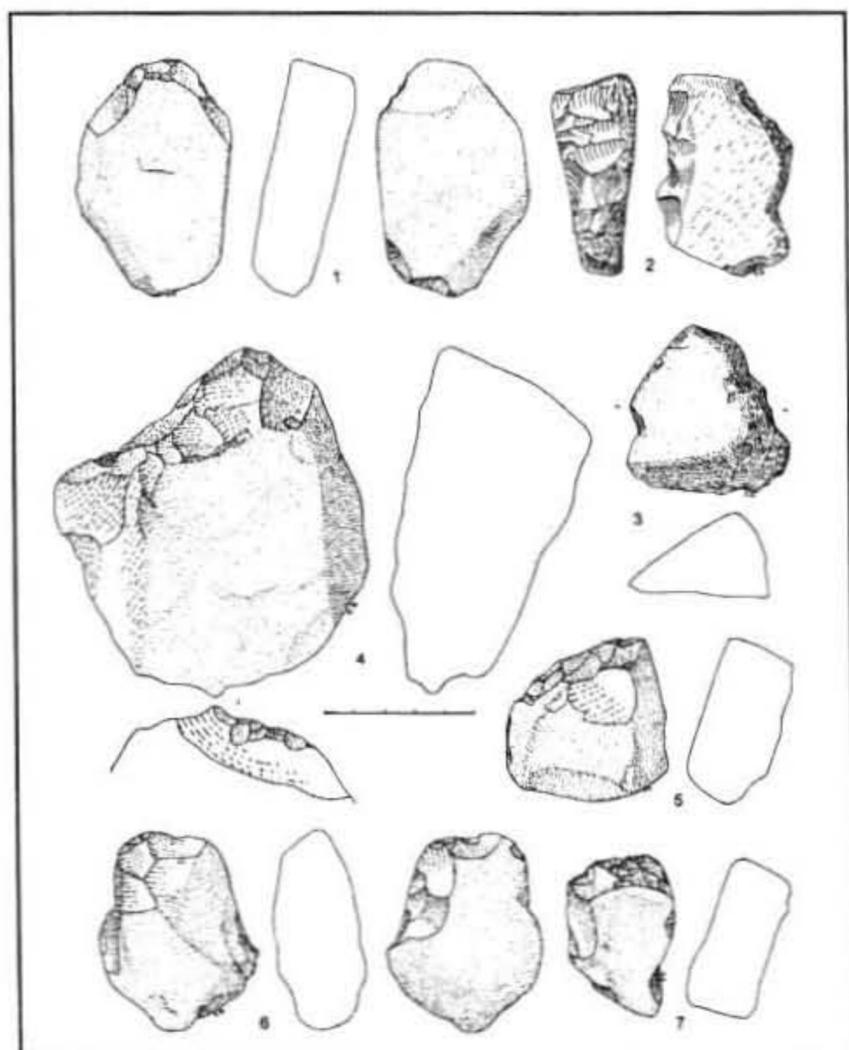
1, 2: notch; 3 rounded point + scraper; 4 crude side chopper; 5: notch + scraper; 6: scraper; 7: small flat pebble abraded and striated; 8: convex scraper + straight end scraper. Scale in cm.

Figure 7: Lithic industry from the Yarkhun valley.

seem to be absent in the Yarkhun valley. The Neolithic Hissar culture in southern Tajikistan may also be related, but it occurs at lower altitudes (Amosova *et al.* 1993).

In the Swat valley (to the southwest of the Chitral valley), the cave site of Ghaligai offers a sequence of 3 levels, of which levels 1 and 3 provide an industry mostly comprising choppers. However, coarse pottery is associated with these cobble tools. The intermediate level 2 yields fine wheel-thrown pottery witnessing a complete cultural change (Stacul 1984).

So, many prehistoric sites occur along the southern margin of the huge Himalayan range and its western extensions into the Hindu Kush and the Pamir. They are at middle or high altitudes (1000 to 4000 m) and mostly belong to the Holocene. The industries include numerous cobble tools and therefore look archaic. They recall the Soanian tradition of the Palaeolithic in the Siwaliks and may originate from it. But these archaic facies are contemporary with the Neolithic and later periods. The sites of the upper Yarkun valley, in northern Pakistan, represent new items supporting the reality of a remote cultural area where a lithic technology of archaic conception was still in practice during the Holocene.



1: double end scraper; 2: denticulate + end scraper; 3: end scraper; 4: abrupt chopper ("rabort"); 5, 7: steep end scraper with bipolar retouches; 6: small chopping tool. Scale in cm.

Figure 8: Lithic industry from the Yarkhun valley.

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