

Sanghao Cave Excavation

The first Season: 1963

By Professor Ahmad Hasan Dani

Peshawar Valley has long been known as the Ancient Gandhara. It is rich with the art treasures of the early historic period devoted mainly to the propagation of the Buddhist faith. The richness of the Gandhara art has exclusively claimed the attention of the archaeologists so far, other fields and periods being sadly neglected in this region. Even the Gandhara art is studied chiefly from the point of view of its borrowed technical tradition and style criticism, and no attempt has been made to relate this art to the socioeconomic context of the Scytho-Kushāna period that gave birth to it. The complexities of human life that produce one or the other art have been poorly understood. In order to meet this deficiency the attempt was made by the University Department of Archaeology at Peshawar to open up new fields and to throw light on the general run of human life in this region. Their first venture was successful in discovering a prehistoric cave at Sanghao, and the first season work yielded a rich stratified deposit of Middle Stone Age tools in the cave. This new study led to the first prehistoric excavation in Gandhara and simultaneously paved the way for enquiry into the Pleistocene stratigraphy in this region. The report of the first season is given below by the excavator.

Introduction

The establishment of the Department of Archaeology in the University of Peshawar, first of its kind in Pakistan, was a happy decision on the part of the authorities, for Peshawar stands in the centre of archaeological sites that abound in this region of ancient Gandhara. Peshawar can thus afford the best opportunity for field training to the students of archaeology. But the archaeology in Gandhara has for long become static - almost confined to the early historic period mainly relating to the Buddhist ruins from 1st to 5th centuries A.D. Apart from this, it must be stated, no new archaeological field¹ has been opened in this region. The incentive was lacking because archaeology has never before been a university subject in Pakistan. But there are present here many other fields that remain to be explored and excavated. One such new branch is described in this report.

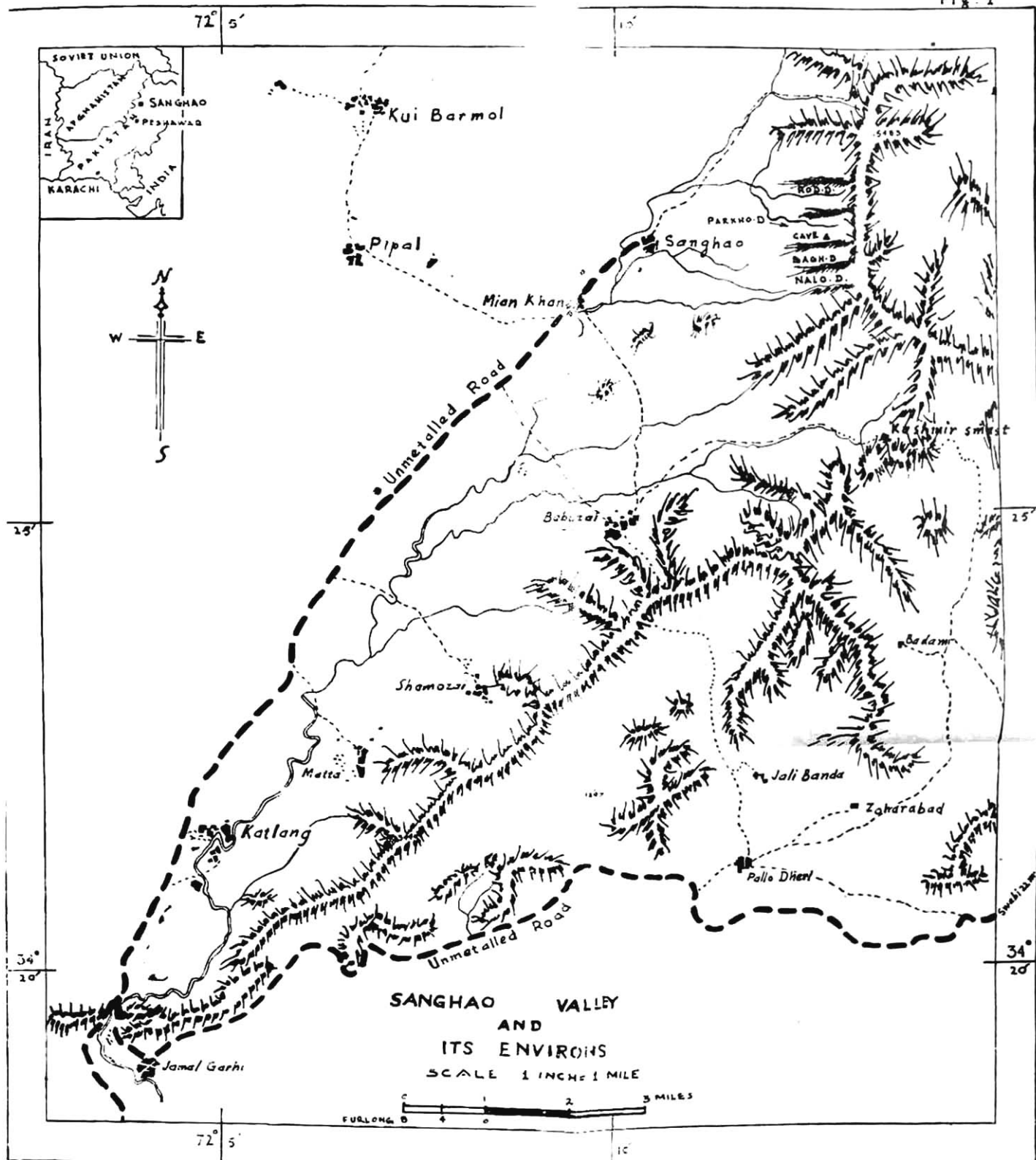
1. There are only two exceptions to this statement. The megalithic complex at Asota has been described by Sir Mortimer Wheeler in *Five Thousand Years of Pakistan*, London, 1950, p. 35. The other relates to the discovery of bronze age grave complex by the Italians at Mingora in Swat but not yet reported. Similar graves discovered by the author will be reported in the next issue.

It was in November 1962 that I went to see the Buddhist ruins² at Sanghao in the company of Mr. M.A. Shakoor, the then curator of the Peshawar Museum, and the members of the Japanese Archaeological Mission in Pakistan. No sooner had we entered the Sanghao valley, which is enclosed in a circle by the spurs jutting out from the main hill, I was struck with the rock formation and the conglomerate deposits occupying the northern flank of the spurs. Large nodules of limestone had been rolled down the hill, broken up into pebbles and carried by river torrent (*khwar*) in its bed. With them were imbedded several fossil tree trunks. What was the meaning of all these? The question gripped my mind, and I lost all charm for the Buddhist ruins that are so familiar to us in this region. The thought of pebbles hovered in my mind, and sometimes I recalled to memory the pebble tools of the Soan valley in Rawalpindi district of Pakistan, but none could I lay hold upon here. I was now desperate and started picking up one kind of stone, which I could distinguish from others, but they were not necessarily tools. My companions discouraged my efforts. Only my student, Mr. Shujaul Mulk, stayed behind with me helping in carrying the stones. They were, of course, not tools, but they helped me in formulating my future step. Suddenly my eyes fell on a scatter of quartz in the field. I thought of microliths, but no microlithic tools could be recognized. However, I was happy to fill another pocket with quartz bits. While my companions were sorry for my wasting time and not seeing the Buddhist monasteries, I was happy to roam about in the valley in the company of the village boy Miskin. There suddenly rushed forth a group of monkeys! What for did the monkeys come in this valley? Miskin led me on to the water spring and gave me some forest berries. He said, "The monkeys eat them and we also." And out came from my mouth: "And thus they were eaten by men in the past". Who were they and where did they live? Miskin got the idea and this time he led me on to the caves. One cave after another - small, medium and big - until I reached the largest cave. There I decided to rest and brood. The cave is now occasionally used by herdsmen during stormy weather. Could this not be used in the past? My answer was in the affirmative, but my other companions, who came round there, would still regard it as a Buddhist cave because they had already seen a cave at Kashmir-smast used by the Buddhists. I sat down, made a deep hole, and dug out this time, no doubt, quartz tools—tools of the most unusual kind in the most intractable raw material, and I decided to stake my future on the excavation of this cave.

Fortunately Mr. Mohammad Ali, the Vice-Chancellor of the University, agreed to my proposal of excavation and was kind enough to provide funds. The member of the local Union Council, Mr. Gul Rahim, and his brother, Mr. Abdul Halim, were good enough to get the approval of the local villagers to my excavation at the cave, and later they played host to the whole excavation team. We had the benefit of staying at their *hujra* during part of our work. The excavation was carried out under my direction in two short periods lasting for three weeks in all. I am glad to acknowledge the assistance of Mr. Farzand Ali Durrani, Senior Lecturer in the Department of Archaeology, Mr. M.A. Shakoor, Mr. Farid Khan, and a batch of

2. For detail see Major H.H.L. Cole: *Memorandum on Ancient Monuments in Eusofzai, with a description of the explorations undertaken from the 4th February to the 16th April 1883, and the suggestions for the disposal of the sculptures*. Simla, 1883, pp. 10-22.

Fig. 1



M.D. KAMAL

fifteen students of the department. The photographs were taken by Mr. Mohammad Sabir, the photographer, and the plan and section copied by Mr. Mohammad Daud Kamal, the draftsman, and Mr. M. Sabir, a student of the Department of Geography. It is the cooperation of all these persons that made the excavation a success. At the end I must also thank Lt. Col. Faizullah Khattak, the Registrar of the University, Maulana Ahmad Hasan, the treasurer, and Mr. Aslam Khan, the business officer, all of whom helped me in several ways in administrative matters.

Geographical Setting

Sanghao is today an insignificant village situated in a secluded corner at the foot of the hill that separates Buner from the district of Mardan in West Pakistan (*Fig. 1*). It stands on an elevation of 1700 feet, 21 miles due north-northeast from Mardan, at north latitude $34^{\circ} 28'$ and east longitude $72^{\circ} 12'$. The name Sanghao is derived from the old Sanskrit word *Sangha*, meaning a (Buddhist) monastery and obviously implies the many ruins of the Buddhist period spread over in the valley. These Sanghao ruins are not isolated by themselves as the modern village appears to be, for to its south about twelve miles away stand the famous monastic ruins at Jamalgarhi and to its north at Palai have been found several Buddhist sculptures. In between can be seen the mounds at Chichardheri, Shamozaï, Babuzai, Miyan Khan and Kui Barmol. Still further to the north lies the entire valley of Swat, which was bubbling with monastic life in the past. In this long chain of Buddhist expansion Sanghao stands in the middle, not far from the Shahkot pass, which appears to have given an easy access, in the past, from the valley of Peshawar to that of Swat and vice-versa. Sanghao is thus on an old route and its monastic prosperity depended on the maintenance of this route. The diversion of this route along the Malakand pass led to the impoverishment of the populace in this region. As it will be shown below, the Buddhists followed earlier peoples who have left behind several periods of cultural occupation along this route.

Judged from the modern geographical map, Sanghao does not play any significant role. But Foucher³ correctly realised the importance of this place and opined that the Chinese pilgrim Hiuen Tsang followed this route. If one places Sanghao in the old Gandhara, which was mainly the valley north of the river Kabul, including a pocket of the Peshawar area on the Bara river, its position can be better understood. This northern valley of the Kabul is further divided by a low range of hill, broken in several places, bearing the name of Paja Hill that shoots out from the main eastern range and ends at Takht-bahi. The modern road to Malakand from Peshawar goes around this hill. North of this hill is the region of Baizai and south that of Yusufzai – two names of the Pathan tribes. The Paja Hill makes a beautiful landscape in the valley and has naturally led to several folk stories. In the past it was the rendezvous of the Buddhists. At its eastern end we have the rock edicts of Aśoka at Shahbazgarhi, in the middle are the remains of Jamalgarhi and at the western end is the Takht-bahi, monastic establishment.

3. *Notes on the Ancient Geography of Gandhara*, Eng. Tr. by H. Hargreaves, Calcutta, 1915, p. 32.

The main drainage from Baizai into Yusufzai is provided by the river Kalpani (wrongly corrected as *Chalpani*⁴ meaning flowing water), correctly *Kālapāni*, meaning water (or river) of destruction. The name is very significant. It drains the water from all the torrents coming from the hills, and hence during the rains it causes great havoc.

At Jamalgarhi there is a break in the Paja Hill, through which passes the Mardan-Katlang road, at the end of which stands the village of Sanghao. Immediately behind this hill the road cuts the Chichardheri into two. Beyond the *Dheri* lies a wide open plain which gradually rises towards the north and east until we reach the foot of the hills. In this area there is only one irrigation canal that comes from Dargai headworks and flows beside the village of Katlang. The land south of this canal is well irrigated, thus making a change in the local economy since 1947, but the northern part, being higher, is left to the mercy of annual rain. The horizon on the north is marked by the Malakand ridge running east and west. The east is flanked by a long range of hill, called Sakra Hill. It has a jagged skyline. From these main north and east ranges spurs jut out into the plain, each of them being separated by a drainage channel. At places wherever there is a suitable catchment area, water springs can be seen (Pl. IV). Sometimes the spurs are long enough to enclose small valleys, locally called *Tangai*.

Six miles beyond Katlang can be seen the hamlets (Pl. II) of Sanghao right at the mouth of an enclosing spur, called Machizai, the inner side of which properly limits the Sanghao valley. The spur abruptly ends at the eastern edge of the village but at the western end an outcrop apparently continues the spur and runs only a little short of the Malakand ridge. Significantly this outcrop is called *Khandao*, meaning a break, from the Sanskrit word *Khanda*, as it is really a break from the main hill. It is through this break that the old route to Kui Barmol ran, though the villagers sometimes like to climb up the hill and go across it.

The Sanghao valley is a rugged area of undulating plains broken up by *Khwar*s (torrents) and the sides shredded by piercing spurs shooting out from the main northern and eastern hills. The plains rise gradually from the level of the *Khwar* to the hill slopes, and quite naturally the villagers have distributed the cultivable land into terraced fields (Pl. V a). The fields are strewn over with limestone gravels and quartz bits. Some of them have been piled together by the humble ploughmen at the hedges of the fields in order to demarcate the boundary. It is from among them that the late stone age tools (to be described in a later issue of the Journal) have been picked up. As the water is scanty and the soil not very deep, cultivation is done in the most crudest manner possible. No tubewell is known in this area. However, some wells of the Buddhist period are seen in the valley. The rain water is now collected into two tanks, and several devices are adopted to channelise water from one field into another (Pl. III b) until it finally flows into the *Khwar*. The tanks are also replenished by an overflow of water from the natural springs, which are now connected by pipelines (Pl. III a). These

4. *Gazetteer of the Peshawar District*, 1897-98, p. 12.

springs are main life source for the people of this valley, and it is about them or due to them that the whole fauna and flora throbs in the valley. It is no wonder that a *tangai* or *darra* (canyon) flowing with water is often a bone of contention between the villagers. It is near the spring that the old village was situated until it was shifted to its present spot by the British for reasons of protection and control. It is also for this reason that the Buddhist establishments were located on the hill spurs. These spurs have small flat areas at different heights just sufficient for small settlements. Within the large Sanghao valley there are small *tangais* or *darras* (canyons). Beginning from the south they are known as Sharmkhan, Bagh-darra, Parkho-darra, Rod, Tangai, Haya-tangai and Natthu (Pl. VI a). The Buddhist ruins (Pl. VIII a) are today seen in the last four canyons as well as in the neighbouring Nalo-darra which lies immediately south of Bagh-darra across the spur. In these smaller canyons natural caves (Pl. VII b) are seen, the most important being in Rod, (Pl. VII a), Parkho-darra and Bagh-darra. All these caves were used occasionally by the Buddhists, and their remains are seen on the top surface. Today the herdsmen, who bring their cattle for grazing in the hill slopes, sometimes occupy the caves to protect themselves from burning heat in summer or drive their cattle into them to avoid stormy weather. Occasionally a group of hunters pass vigilant nights waiting for the game animals that still roam about and come to drink water at the springs. Vegetation in the valley is few and far between. Near the water sources bushy jungle is seen, otherwise scrubs and scattered grass are found in the interstices of the rocks and in the plains left free from cultivation. No tall trees are found here probably because they are cut away by the villagers.

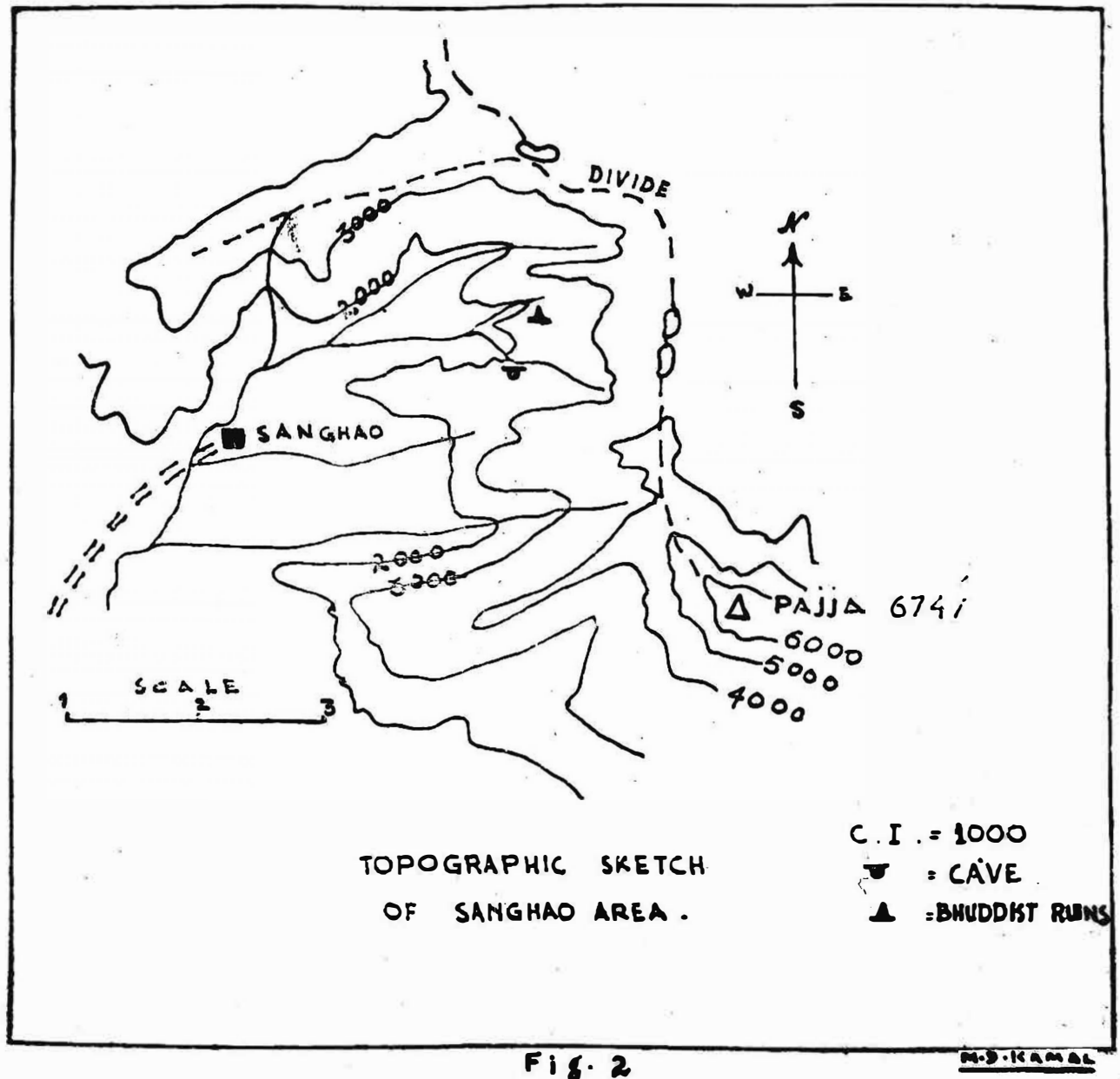
It is in the Parkho-darra that the excavated cave (Pl. I) is situated about 3 miles away from the village of Sanghao. The *darra* is longitudinal, lying east and west between two spurs, the cave being located in the southern one and facing north. At the foot of the northern spur is a little *Khwar* (torrent) full of gravels in its bed. Between the cave and the *Khwar* there is a flat space (see fig. 5) of 100 feet on the average, composed of modern alluvium overlying an earlier geological fill. It is in this flat area that cultivation has been going on for centuries. Similar cultivable land is available on the top surface of the spur over the cave. The dressing of these fields with diaper masonry (Pl. V b) suggests Buddhist hand. But pre-Buddhist cultivation is not ruled out.

Geological Setting⁵

The village of Sanghao stands at an elevation of about 1700 feet, and the cave lies at an elevation of about 2000 feet near the mouth of one of several canyons with narrow deeply alluviated straths which debouch east of Sanghao and join to form the piedmont plain which slopes south and west to the Swat river. Long spurs upto 4000 feet in elevation lie a couple of miles north and south of Sanghao and extend south-westerly for several miles beyond the village. The main north-south ridge

5. Based on the contribution of Prof. John Eliot Allen, Professor of Geology at the University of Peshawar (1963-64), originally of Portland State College, U.S.A.

to the east (the divide between the Swat and Indus rivers) is even higher, culminating in Paja peak at 6747 feet elevation (Fig. 2).



Bedrock (Pl. VI b) near the cave consists of phyllite and schist, and minor calcareous sandstone referred by King to the Lower Swat-Buner schist group, of

lower Palaeozoic age. Above the schist, both capping part of the ridges to the north and south, and making up the higher parts of the main ridge to the east, is a massive grey limestone from one to two thousand feet thick, possibly more. This limestone is severely contorted in detail, and cut by numerous calcite stringers and veins.

About 300 feet north of the cave across the canyon, and about 50 feet above the alluvium, white vein quartz crops out for a few tens of feet along the axis of a minor anticlinal fold in the schist. It varies in thickness up to over three feet, and was obviously mined as a nearby source of artifact material.

The cave (Fig. 3) itself lies within a cemented limestone conglomerate, or better, breccia, since most of the boulders are very poorly rounded to angular.

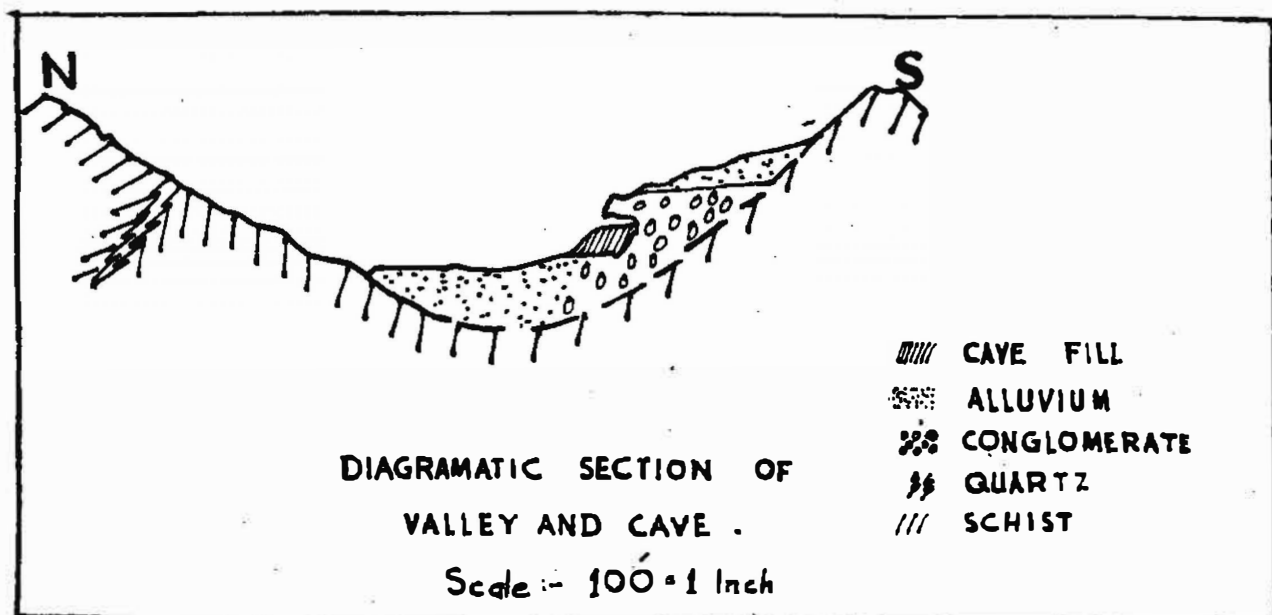


Fig. 3

The deposit is at least 50 feet thick, made up of limestone fragments predominantly, from a few inches to several feet in diameter, derived from the erosion of the limestone in the ridges above and deposited as a conglomerate probably during the Mindel glacial stage (400,000 to 500,000 years ago). Krishnan⁶ describes the Lei conglomerate of the Potwar area, with which it may be correlative. Wadia correlated this with the Terrace 1 of Kashmir. Colber and Lewis call the Lei conglomerate upper lower (Villafranchian) rather than lower upper Pleistocene. The coarseness of the deposit is said to have been caused by uplift of the adjacent mountains. It might equally well have been caused by increased precipitation and alluviation during a glacial stage.

6. M. S. Krishnan, *Geology of India and Burma*, Madras, 1949, pp. 548-9.

The Vale of Peshawar:- The vale of Peshawar lies between the Indus river on the east and the foothills of the Hindu Kush on the west. It occupies a structural basin south of the Himalayan foothills which has been cut off from the southern part of West Pakistan by the rise of the Salt Range and the line of hills which extends from Attock to north of Kohat. As this folding (and faulting) progressed during upper Cenozoic time, the basin was filled with alluvial materials from the surrounding hills, brought down by the Kabul, Swat and Indus rivers and their many tributaries. Indeed, the evidence of high terraces around the periphery amply indicates that the pre-Pleistocene topography was "drowned" during the lower Pleistocene by the accumulation of valley fill to an elevation several hundred feet above the present valley surface, and that erosion during the upper Pleistocene has removed much of this older fill and redeposited a series of sediments which are described below.

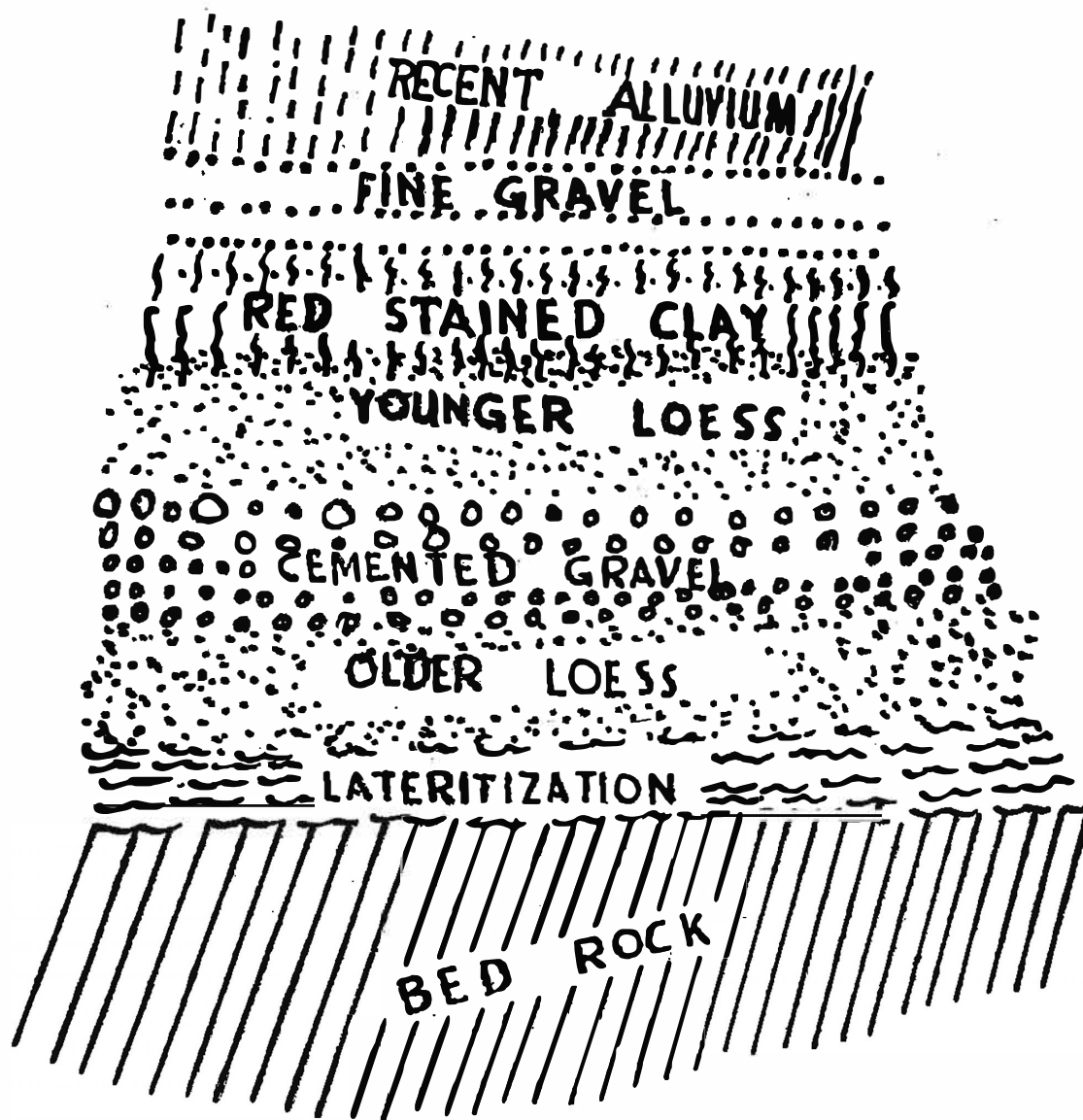
The present valley floor is occupied by the braided courses of the few permanent (Kabul, Swat, Indus) and the many intermittent streams and their interfluvial areas. Towards the surrounding youthfully sculptured hills the piedmont plains and fans rise gradually, with alluviated valley straths extending in many cases for miles into the mountains between enclosing spurs and ridges. Occasional extensions of the spurs have been isolated far out in the plains by the alluvial fill. Terrace levels at many elevations have been cut in the fill during the period of erosion.

The Composite Section (Fig. 4):- The generalized section below represents a composite of a number of localities, particularly at Sanghao, near Thana in Malakand Agency and at the Kalpani near Jalala. All of the units are not present in all the localities, but it is believed that they do represent the same climatic epochs and therefore are correlative.

	<i>Unit</i>		<i>Correlation</i>	<i>Climate</i>
1.	Recent alluvium	...	Recent	Warm, dry
2.	Kalpani lake beds	...	Late or post glacial	Warm, moist
3.	Younger loess, in places red-stained at base	...	Last glaciation	Cool, dry
4.	Cemented gravel and breccia	...	Last interglacial	Cool, moist
5.	Older loess, in places fine clay		Penultimate glaciation	Cool, dry
6.	Laterite zone	...	Penultimate interglacial	Warm, moist

The archaeological correlatives might be considered as:-

1.	Neolithic	To 3000 B.C.	Recent
2.	Microlithic	3000 to 15,000	Upper Warm and Recent



IDEALIZED COMPOSITE SECTION

IN PESHAWAR VALLEY

NOT TO SCALE

Fig. 4

		DANI	(ANCIENT PAKISTAN
	<i>Unit</i>	<i>Correlation</i>	<i>Climate</i>
3.	Late Palaeolithic (Middle Stone Age) ...	15,000 to 50,000 ...	Warm or Wisconsinian
4.	Early Palaeolithic (Early Stone Age) ...	50,000 to 250,000 ...	Wisconsinian and Last Interglacial
5.	" ...	250,000 to 400,000 ...	Mindel or Illinoian
6.	" ...	400,000 to 550,000 ...	Penultimate Interglacial

Description and Interpretation of units:-

1. *Recent Alluvium*:- It occupies erosion channels in older sediments and bedrock, and consists of loose sand, gravel and boulders, derived from sediments and adjacent bedrocks of the upper parts of the drainage channels. It represents the Recent erosion which has formed the stream courses and *nullahs*.

2. *Kalpani Lake Beds*:- They are found beneath the present surface of the plains in the area between Dargai and Mardan, exposed in the banks of the Kalpani *nullah* lying above the Younger Loess. Some sections show up to 30 alternating coarse and fine beds which constitute varves, up to 8 inches thick. The sediment is grey clay, silt and sandy silt. The beds are cut by numerous clastic dikes of silt, a characteristic commonly found in varved pro-glacial or peri-glacial lake sediments. The varves represent the accumulation in a lake of fine sediment derived from melting ice; in this case the ice of the Last Glaciation or the ice of post-glacial alpine glaciers. They may be from 3000 to 15,000 years old.

3. *Younger Loess*:- It consists of unbedded, fine-grained buff-coloured silts which are probably dominantly eolian in origin. The basal part is sometimes red-stained. They underlie the lake beds in the Mardan region, but are found at higher elevations in the tributary valleys around the basin and in the Swat valley near Thana, where they form the sloping surfaces of terraces along the tributary streams, being overlain along the margins by slope wash from adjacent hills. They may be correlative with the thick 'badlands' loess north and east of Campbellpore. Artifacts near Thana lie in but may be intrusions within the Younger Loess. Artifacts at Sanghao cave may be correlative. The Younger Loess represents the cool and relatively dry period of steppe climate during the Last Glaciation. They are probably from 15,000 to 50,000 years old.

4. *Cement Gravel and breccia*:- They lie between the Younger and the Older Loess, their thickness ranging from a few feet in the valley centre to a few tens of feet near the hills. They are heterogeneous in composition, completely unsorted as to the size (up to boulders several feet in diameter), and of angular shape. The valley sections are only partially cemented by calcium carbonate, the limestone

conglomerate at Sanghao cave is wholly cemented. These gravels represent a period of cold wet climate characterized by freezing and thawing and excessive solifluction, mud flows and flooding. Their wide distribution suggests that this was an important climatic change, the cementing of the gravels indicates excess flow from lime-bearing spring or streams, the lack of sorting indicates freezing and thawing. It probably represents the Last Interglacial, dated at from 50,000 to 250,000 years ago.

5. *Older Loess*:- It is found beneath the Cement Gravel at most localities. Its thickness is not known in the valley sections, it lies on bedrock in the tributaries. At Sanghao it may be represented by a clay zone beneath the Cement Gravel. In the field no differentiating characteristics between it and the Younger Loess has been noted, but laboratory work is being initiated to determine size range, degree of weathering, kind of clay, minerals etc. Like the Younger Loess, this unit represents a glacial period of cool dry steppe climate. If this is the penultimate Glaciation the Loess would be from 250,000 to 400,000 years old.

6. *Laterite Zone*:- In a few places the lower part of the Older Loess is red-dened and in a few other places it rests upon a more or less well defined zone of lateritic soil. There is a red zone below the clay horizon at Sanghao, exposed beneath the cement gravel in a bend at Parkho-darra. If this laterite zone represents the Penultimate Interglacial, it is from 400,000 to 600,000 years old.

Conclusions

The extremely tentative conclusions suggested in this paper need verification by further field work and detailed description and measurement of the mentioned sections and as many others as can be found over a still wider area. In addition laboratory work should be done on the various units to determine possible index heavy minerals, distinctive histograms, and other characteristics which would verify correlations made here. Pollen for analysis should be searched for in the loess and lake beds; carbon for C^{14} analysis may be of value in the uppermost units, lacustrine fossils or vertebrate remains may be found to add to the evidence.

To date we can only state that the "Potwar Loess" of Wadia is no longer a single unit; a peri- or post-glacial lake once occupied a basin near Mardan; the loess is divided into two parts by a cemented gravel of widespread occurrence which represents a change in climatic conditions. The Middle Stone Age material in Sanghao Cave may be correlated with Younger Loess.

Parkho-darra Cave (Pl. I and Pl. IX).

The cave, Prof. Allen suggests, probably originated as an overhanging re-entrant resulting from meander undercutting in limestone breccia of the terrace on the south bank of the *Khwar* after incision of the terrace in upper middle Pleistocene time. The tools found in the cave confirm this dating. Later the cave was enlarged and extended by rock-fall and weathering. Such weathering and later

cracks (Pl. XII a) are writ large on the face of the cave. Huge falling boulders have left hollows (Pl. X) in the face, and later rock falls are still lying in front of the cave (Pl. IX).

The cave (Fig. 5) consists of three main parts — the main cave (no. II) measuring

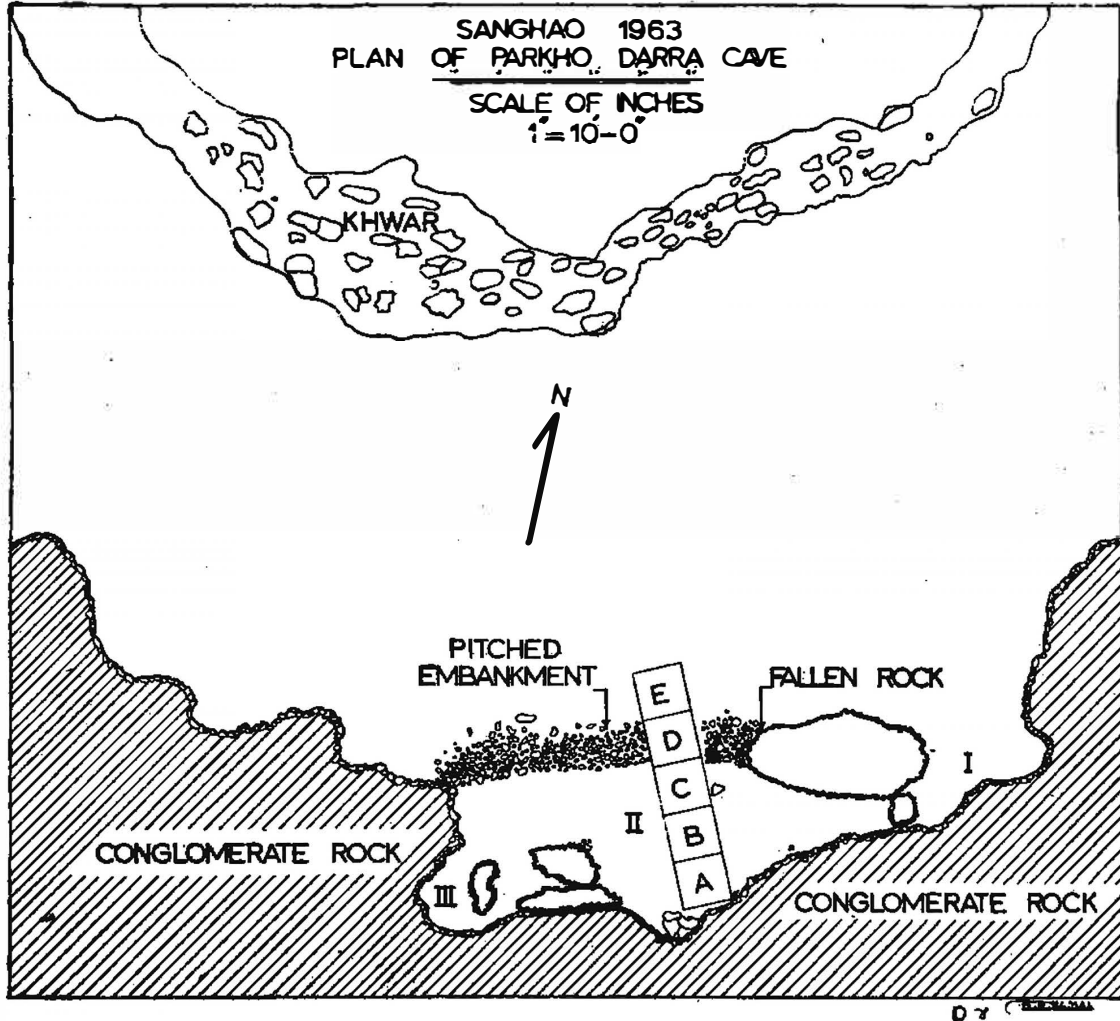


Fig. 5

80' long by 35' deep by 14' high, a fallen portion (no. I) with a big boulder and a tree in front, and a low cave (no. III) separated again by a boulder fall (Pl. XI b). Further away to the west can be seen the beginning of more cave formation (Pl. XII b) in two stages. The lower portion is just a wide opening, where one man is seated in the photo, and the upper one provides a little space for rest. The main cave (no. II) is irregularly made up. The ceiling (Pl. XI b) shows a rough curvature, the underside of which is thickly coated with black soot (Pl. XI a). At one place there is a deep hollow, 5' deep suggesting that the breaking away from the conglomerate took place at different times. Some of the fallen material was encountered in layer no. 9. As will be shown subsequently, after this fall the cave was abandoned for quite a long time. Even after the cave was finally given up, a big slice fell

down (Pl. XI b), which now rests on the present floor level. Probably it is this risk of fall that led to the final desertion of the cave.

The present floor of the cave stands five feet above the level of the ground. There is a ramp of stone pitching (Pl. XIII b) that slopes down from the cave floor to the ground level. This pitching is very haphazardly done, and does not seem to be the work of one period. It appears that the upper layer of stones were thrown by the modern cultivators, though the lowermost stones must have been thrown by earlier men at least from the time of the Buddhists (See Fig. 6 for the section). This pitched ramp was originally full of bushes (Pl. XIII a) which had to be cut and removed before the excavation could start.

Excavation of the Cave

The excavation in the first season was mainly exploratory: devoted to two main problems — (1) to find out the depth of the deposit in the cave, and (2) to understand the nature of the deposit. These two problems were sought to be solved by vertical digging from the top of the occupation to the rock bottom of the cave. The result was highly successful.

Summary of the result: — There was fifteen feet of deposit in the cave from the top to the rock bottom, the deposit being divisible into twelve different layers (Fig. 6.) Each layer is separated from the one below by an ash-and-charcoal line. The occupation deposit in the cave suddenly stops at the cave entrance, beyond which spreads out the rubbish thrown by the cave dwellers. It is very difficult to distinguish same number of layers (Pl. XIX a) in the rubbish deposit outside the cave. But in general both of them agree in the main occupation periods.

Five main periods have been distinguished in the excavation. Beginning from the bottom, *Period I* includes layers 12, 11 and 10 in the cave and 6 A outside the cave. The period ended in the fall of a big slice of rock from the ceiling that covered the deposit below. It appears that the cave was not occupied for some time because of the risk of fall.

Period II includes layers 9, 8, 7, 6 and 5 in the cave and layer 5A outside the cave. There is a change in the colour of the raw material used in this period. The majority of them show red staining, the staining, being the result of the red colour of the soil. The period also closed with a slight sliding of the back rock noticeable in the trench.

Period III includes layers 4 and 3 in the cave and layers 4A and 3A outside the cave. In this period the layers are made up with loose reddish clay, probably derived from the top reddish soil seen in the valley. The top of this occupation is disturbed by the people who came to occupy period IV, which consists of layer 2 inside the cave and layer 2A outside.

Periods I, II, and III have purely stone age material, while period -IV shows late historic material referable to the time of the Buddhists, circa 2nd century B.C. to 2nd century A.D.

Period V is a natural deposit outside the cave including layers 1, 1A and 1B, which obviously filled in after second century A.D. It is in this period that the rock now seen lying on the floor inside the cave (Pl. XI b) fell down.

New Problems:- The excavation created two new problems during the course of the work. They remain to be solved in the coming season's work.

(i) A small trench laid outside the cave at the bottom of the deposit revealed layer 7A and the same kind of stone tools as encountered in Period 1. For lack of time the excavation had to be stopped. It is necessary to extend this trench in the open space available in front of the cave right up to the *Khwar* and dig down up to the basal rock so as to reveal probably an earlier occupation deposit. This is likely to solve also the geological stratigraphy of this area—specify the filling in the valley floor between the basal rock.

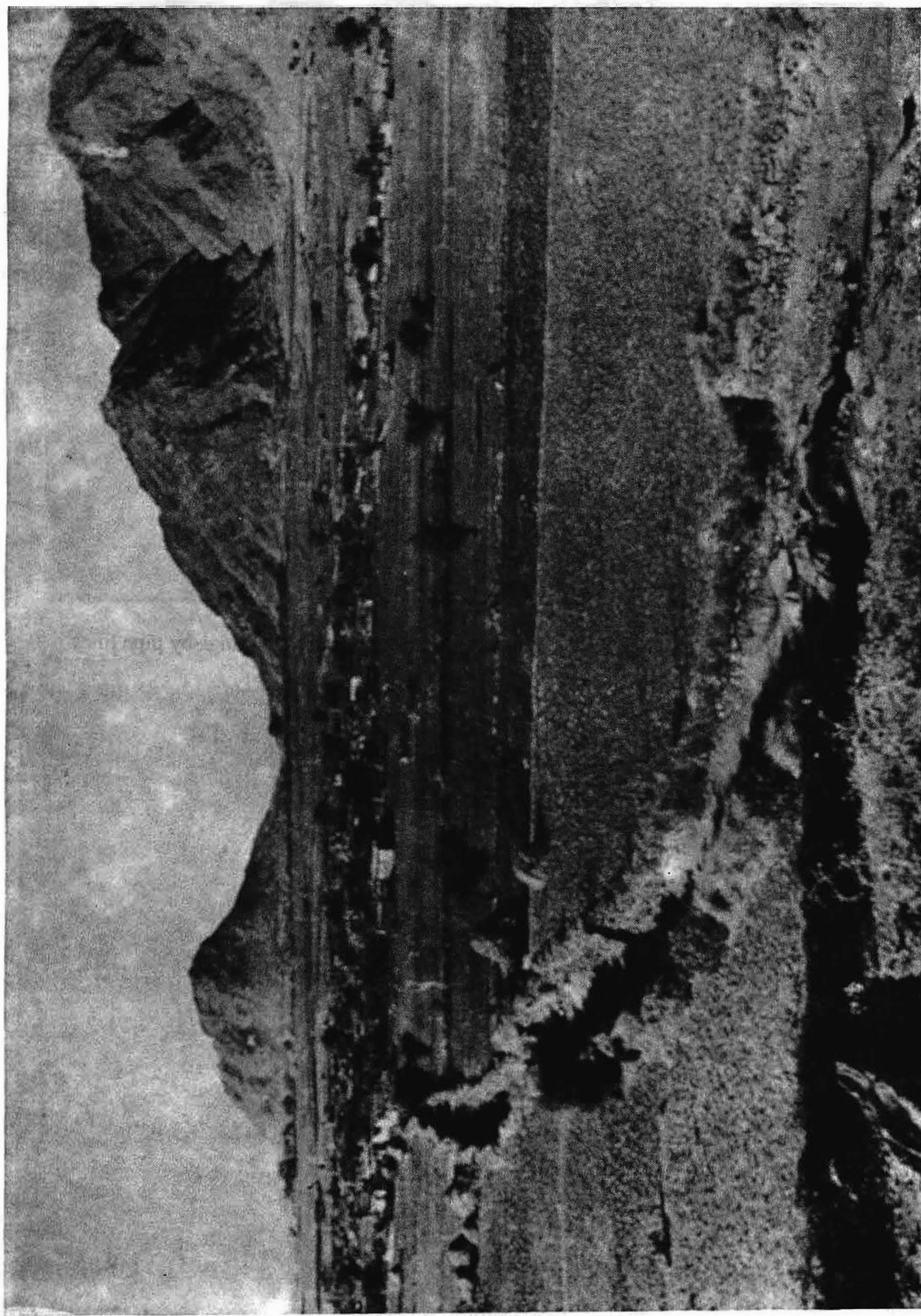
(ii) The vertical dig inside the cave has to be extended horizontally and the rich prehistoric material has to be collected carefully so as to reveal the complete life of the prehistoric man. It is possible that the side parts of the cave might contain some burial. The charcoal has also to be collected for radio carbon dating.

Detailed report

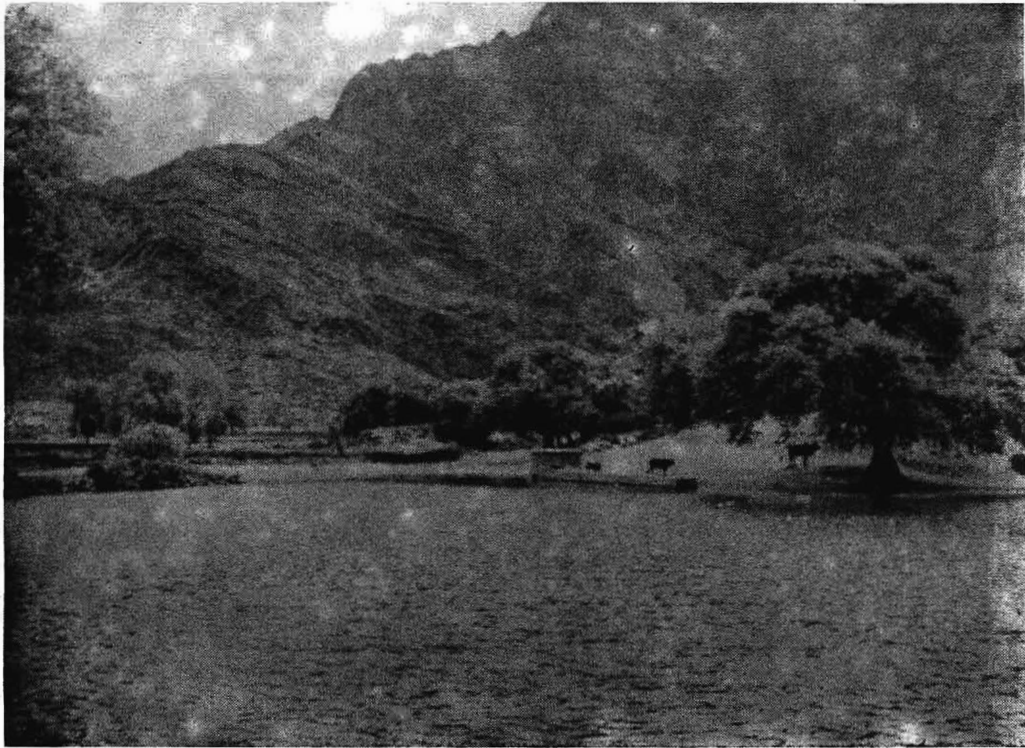
As shown in Fig. 5, a long trench 50' by 10' was laid perpendicular to the long stretch of the cave. The length was further sub-divided into five small trenches 10' each (Pl. XI V, a and b). Originally a small balk of one foot was kept in between the trenches. Out of them trenches A, B and C were inside the cave and D and E were outside the cave. Practically the whole of D was covered by the pitched embankment (Pl. XIII, a and b) and was completely overgrown with bushes. After removing the bushes the excavation was undertaken trenchwise. Towards the close of the excavation the balks were removed and the embankment was also cleared so as to get a clear view right across the cave (Pl. XVII) and get a section right through (Pl. XVIII).

The excavation continued right up to the rock bottom in the cave, which showed a very rough surface occupied by limestone nodules with grit and sand deposited in the holes obviously by river action. The gravels stop short in the cave and against them is packed compact white clay (Younger loess), in time later than the conglomerate of the cave but earlier than the occupation material in the cave (See above on Geology). A trench in this compact clay yielded layer 7A and produced stone tools of the same type as in Period I. For lack of time the excavation had to be stopped below layer 7A, though the tools continue downward. Virgin soil was not reached in this trench. Inside the cave the first period began with layer 12 having a regular habitation indicated by ash and charcoal left-overs together with animal bones, teeth, fragments of horns and plenty of quartz tools and waste quartz. Besides quartz we also found schist fragments including points and edged tools. The size of the tools in Period I is comparatively larger than the tools of the later periods. The layers in this period are composed of yellowish or whitish hard clay, mixed with grit, sand and charcoal inside the cave and containing tools of white quartz. Red staining was noticed on rare specimens of quartz, suggesting

Fig 6



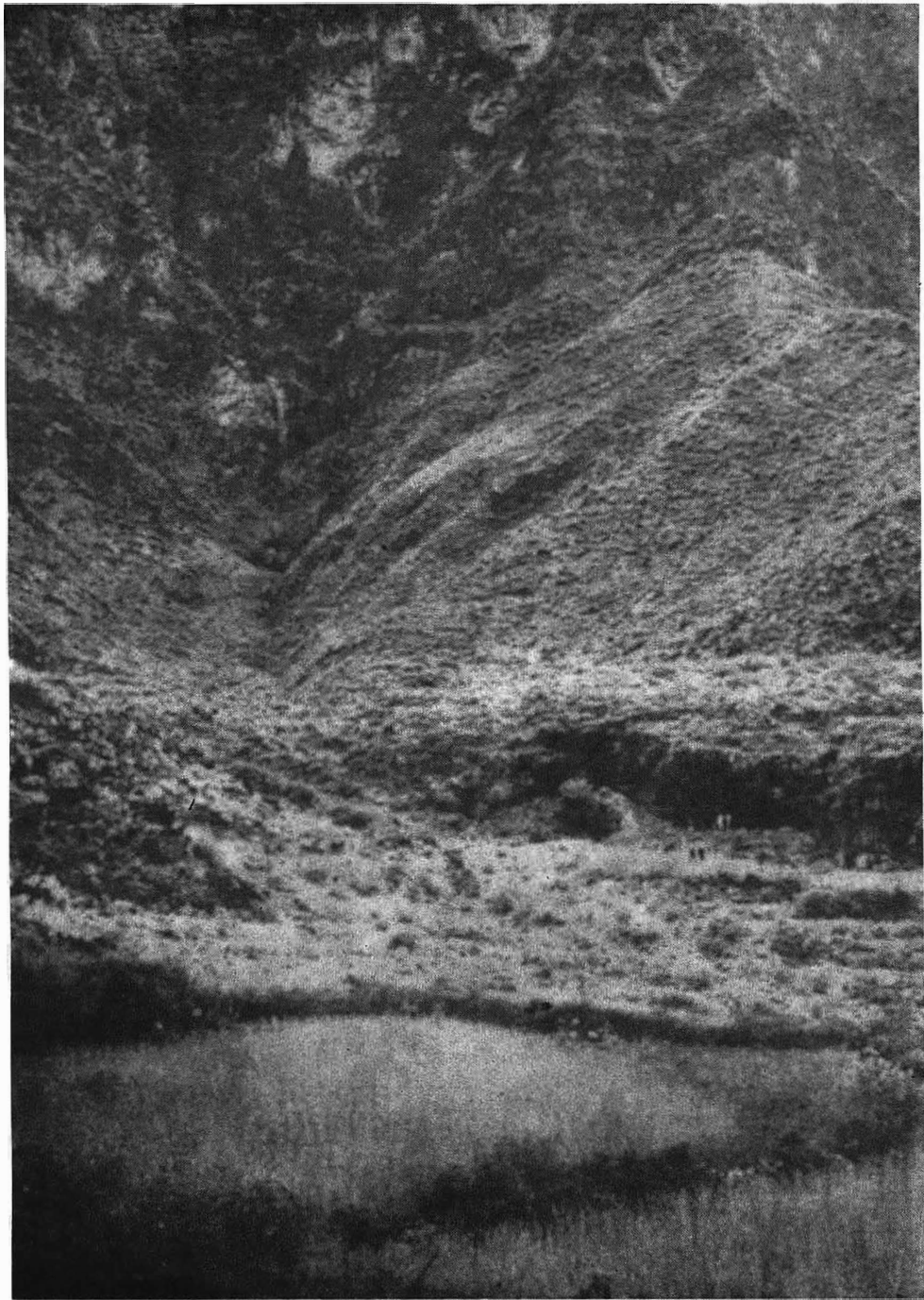
Pl. II — Sanghao Village seen from Machizai, Khandao in the Background



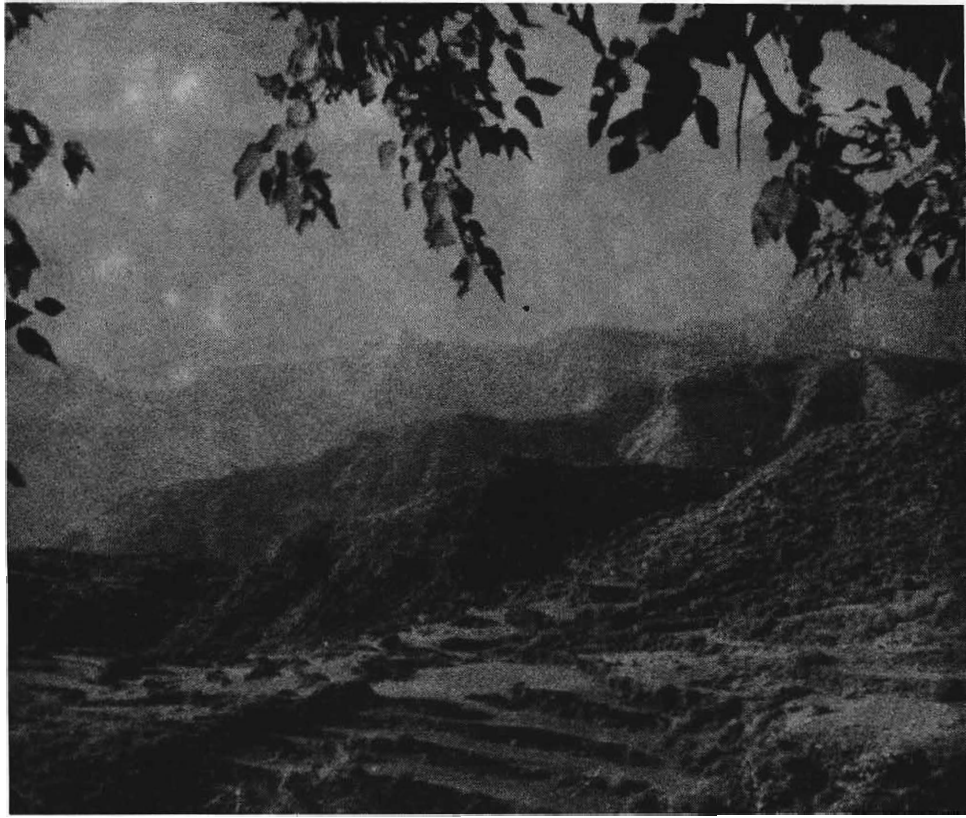
Pl. III a — Sanghao — The village tank filled with water from the hill springs by pipe lines



Pl. III b -- Sanghao -- Old water channel



Pl. IV — Parkho-darra Cave on one side and the water catchment from the spring at the joint of the hills above



Pl. V a — Sanghao — Terraced fields on the hill slopes



Pl. V b — Sanghao — Diaper masonry used in the terraced fields



Pl. VI a — Sanghao — Three canyons (1) Rod, (2) Parkho-darra, (3) Bagh-darra



Pl. VI b — Bedrock lying at an angle



Pl. VII a — Rod, General view



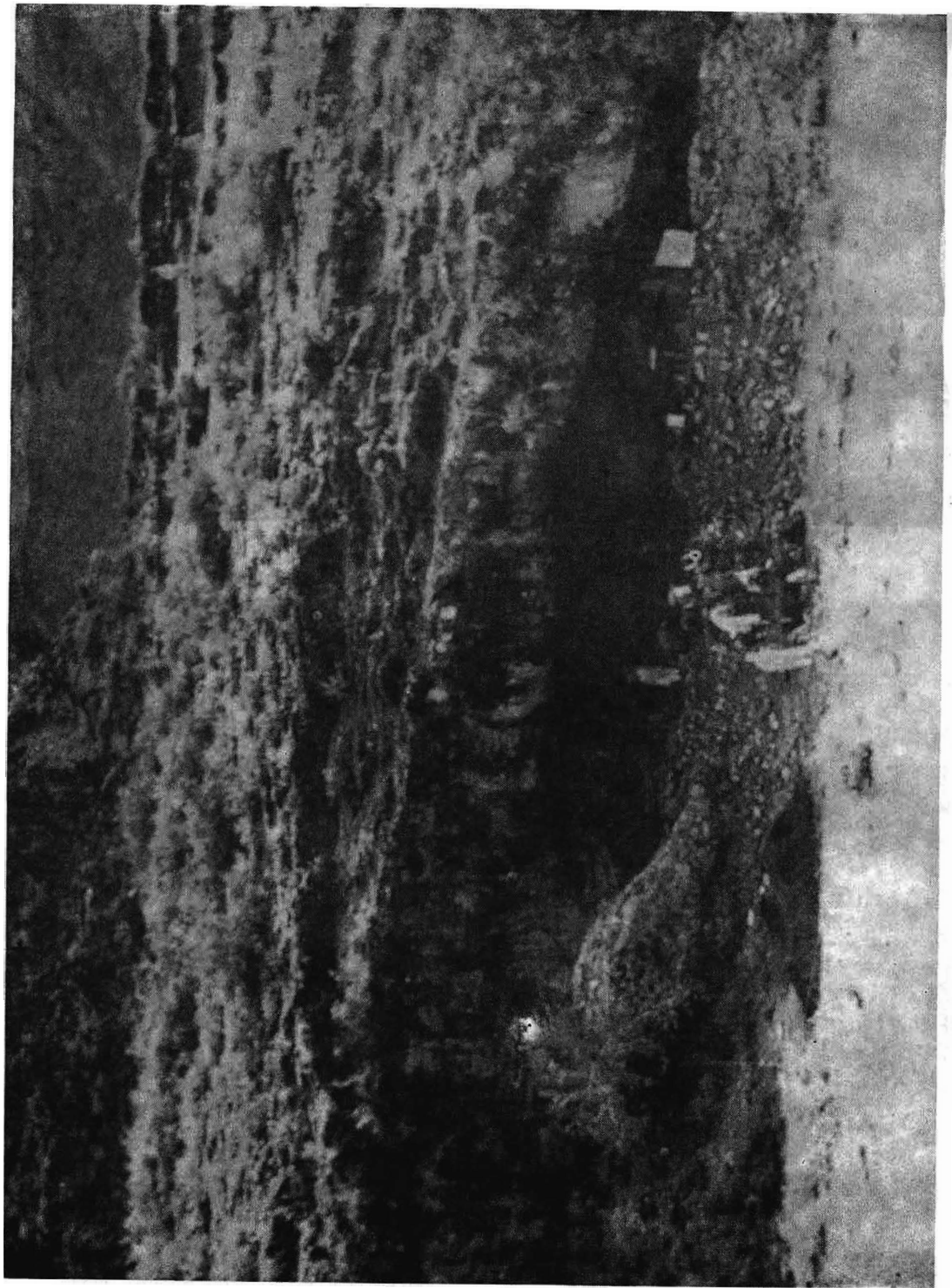
Pl. VII b — Sanghao — Small Cave in Rod



Pl. VIII a — Rod, Buddhist ruins



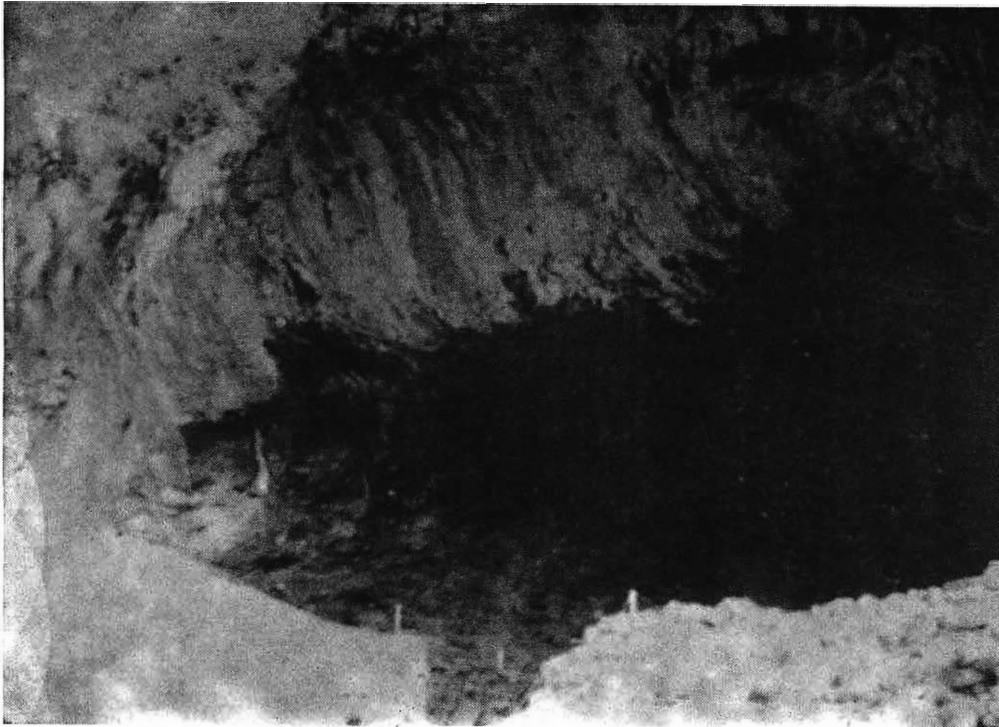
Pl. VIII b — Rod, Buddhist ruins on top of a cave



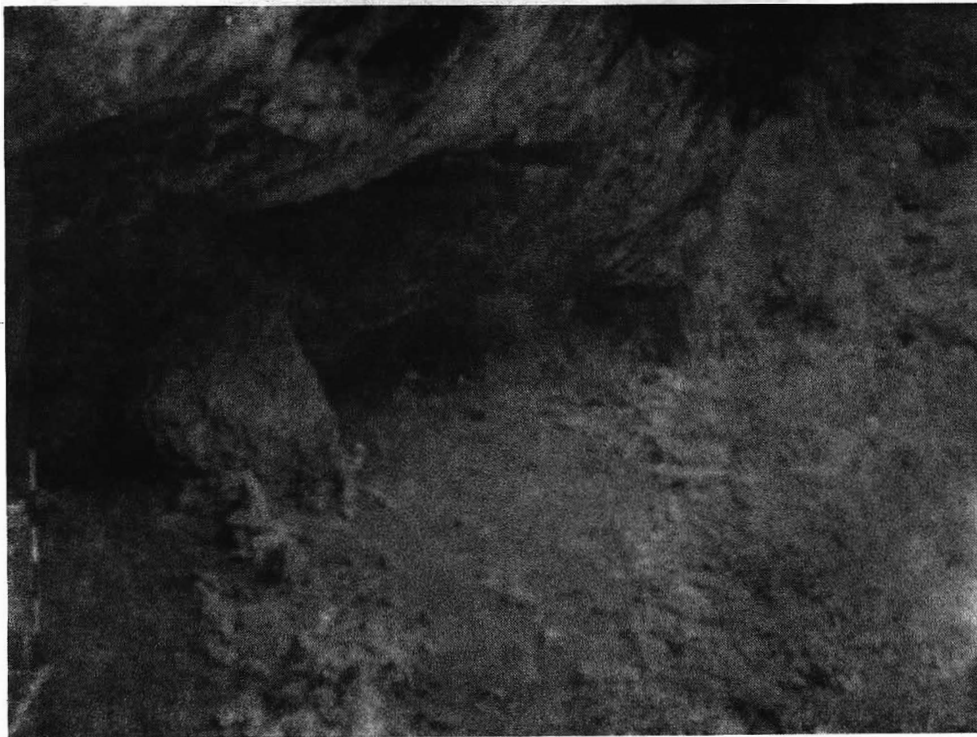
Pl. IX -- Sanghao - Parkho-darra cave under excavation, huge rock fall in front



-- Parkho-darra cave showing hollows on the face after rock fal



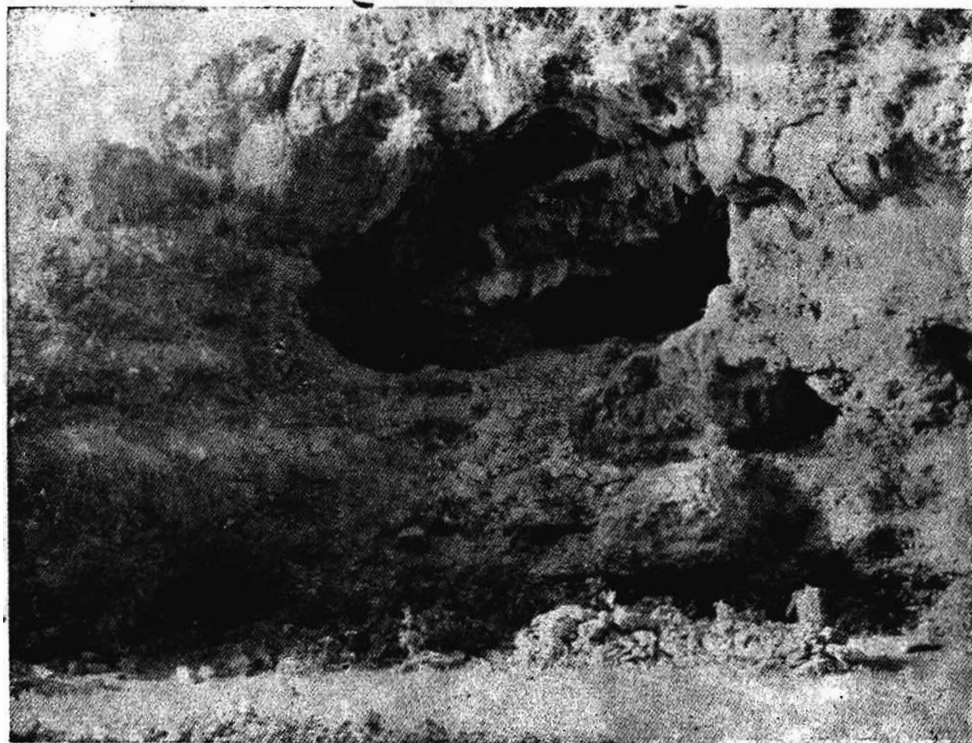
Pl. XI a — Sanghao — Black Soot in the ceiling of the cave



Pl. XI b — Sanghao — Big boulder fallen in the cave



Pl. XII a — Sanghao — Cracks in the Conglomerate near the Parkho-darra Cave



Pl. XII b — Parkho-darra — Small cave to the west of the main one



Pl. XIII a — Sanghao — Bushes in the pitched ramp



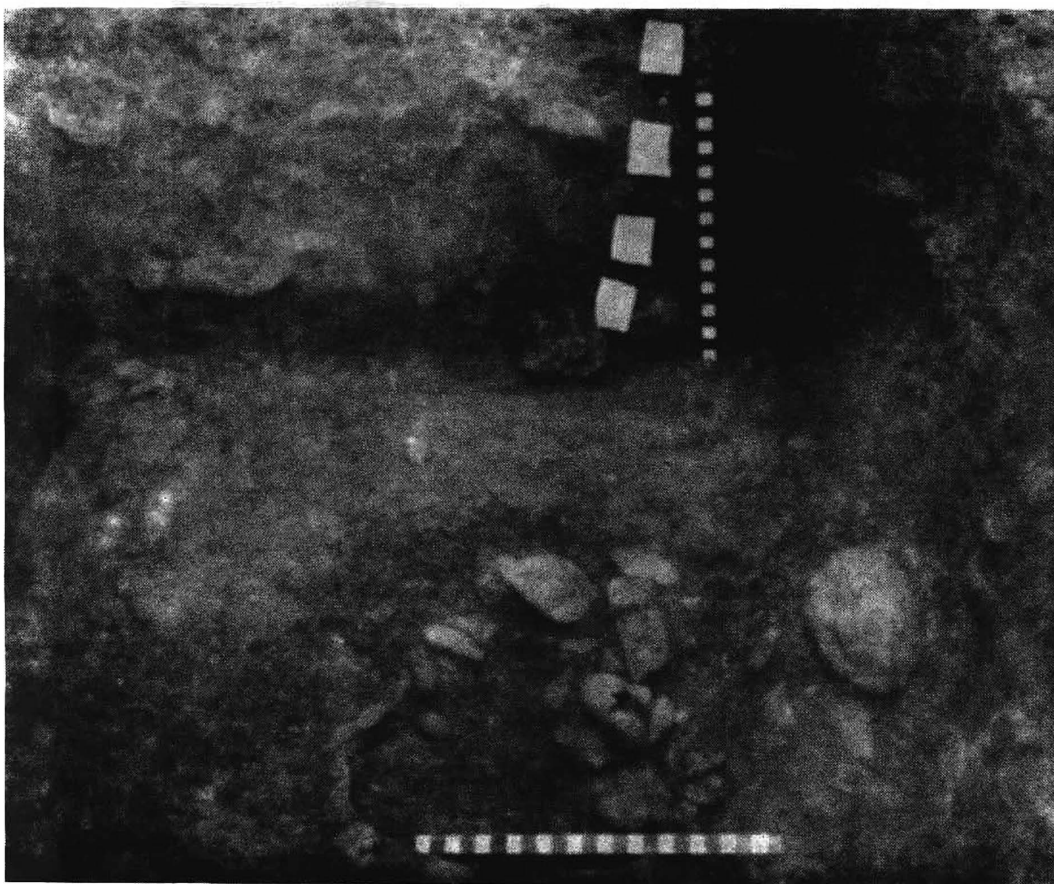
Pl. XIII b — Sanghao — Stone pitching in the Cave



Pl. XIV a — Sanghao — The demarcation of the trench in Parkho-darra Cave



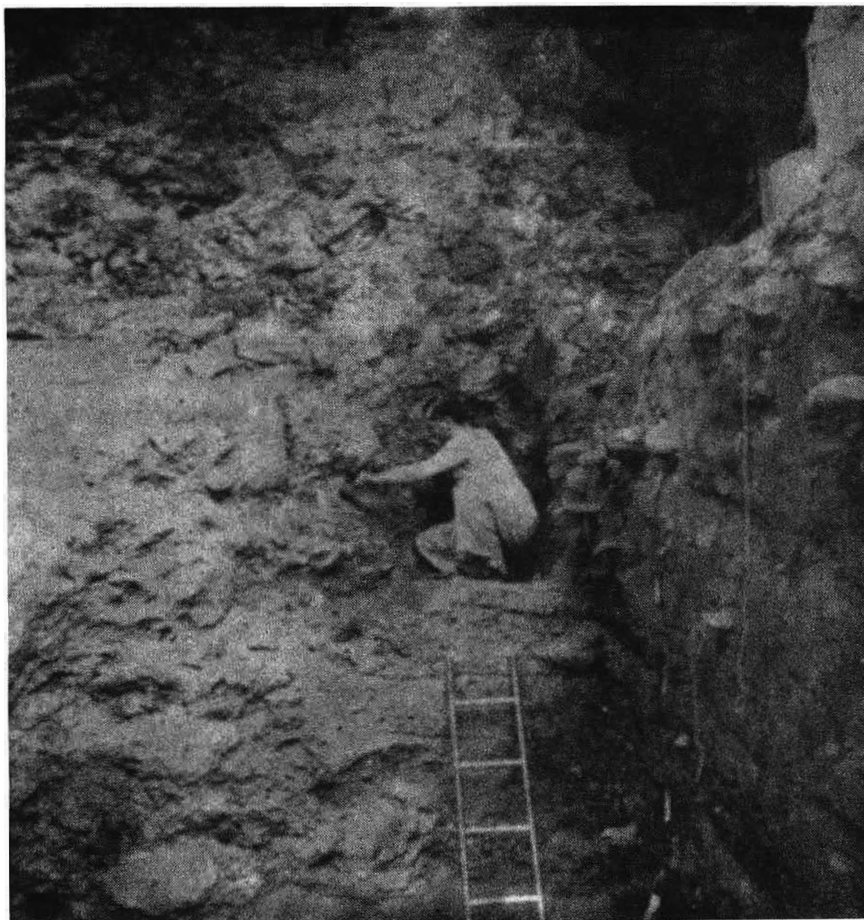
Pl. XIV b — Sanghao — Parkho-darra Cave Excavation in progress



Pl. XV a — Parkho-darra Cave — Modern skull surrounded by stones in the alluvium



Pl. XV b — Parkho-darra Cave. The cave bottom being cleaned



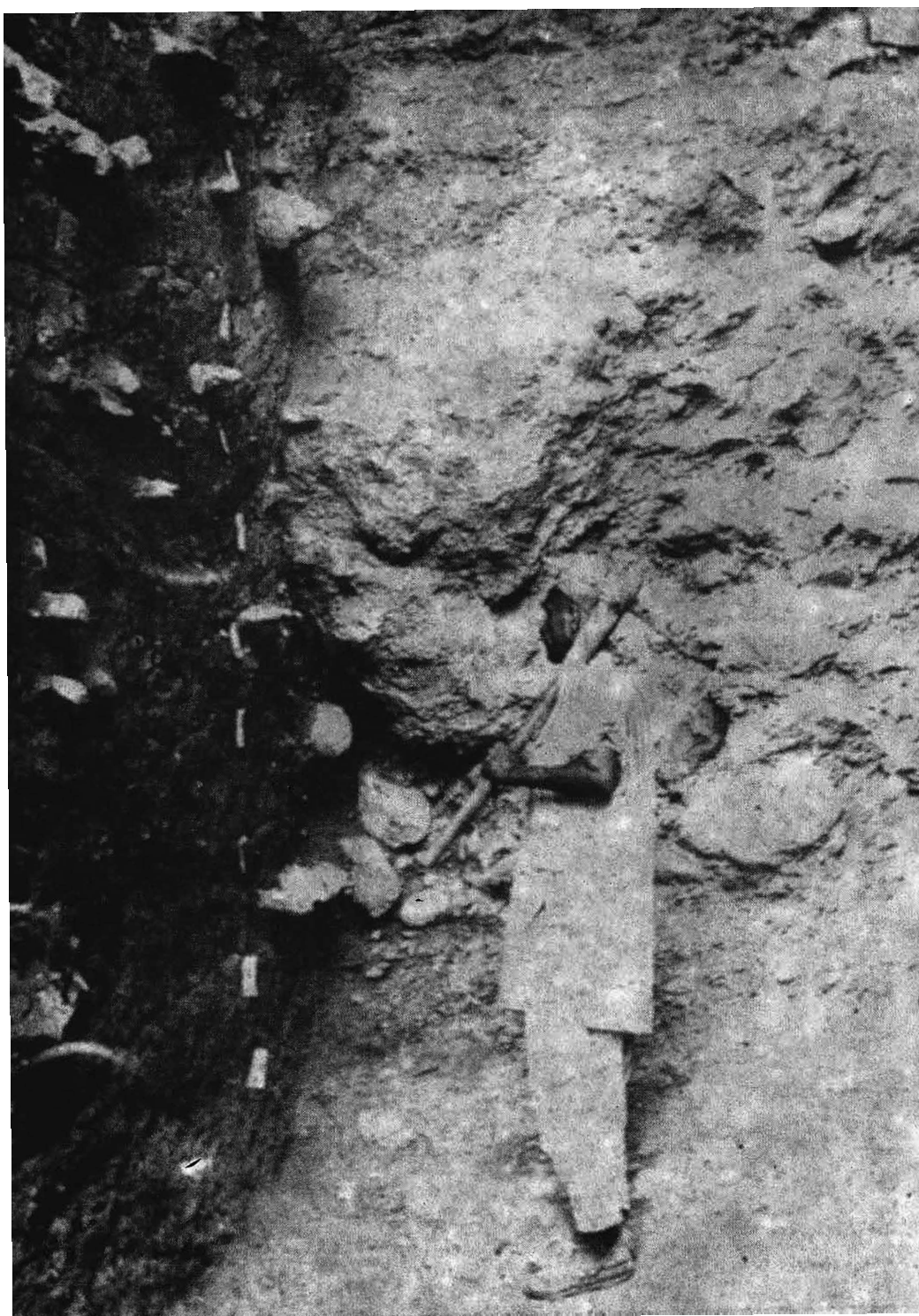
Pl. XVI a — Parkho-darra Cave — Back Rock of the Cave being cleaned



Pl. XVI b — Parkho-darra Cave — Stone lined pit being cleaned



Pl. XVII — Parkho-darra Cave. 15' deep trench



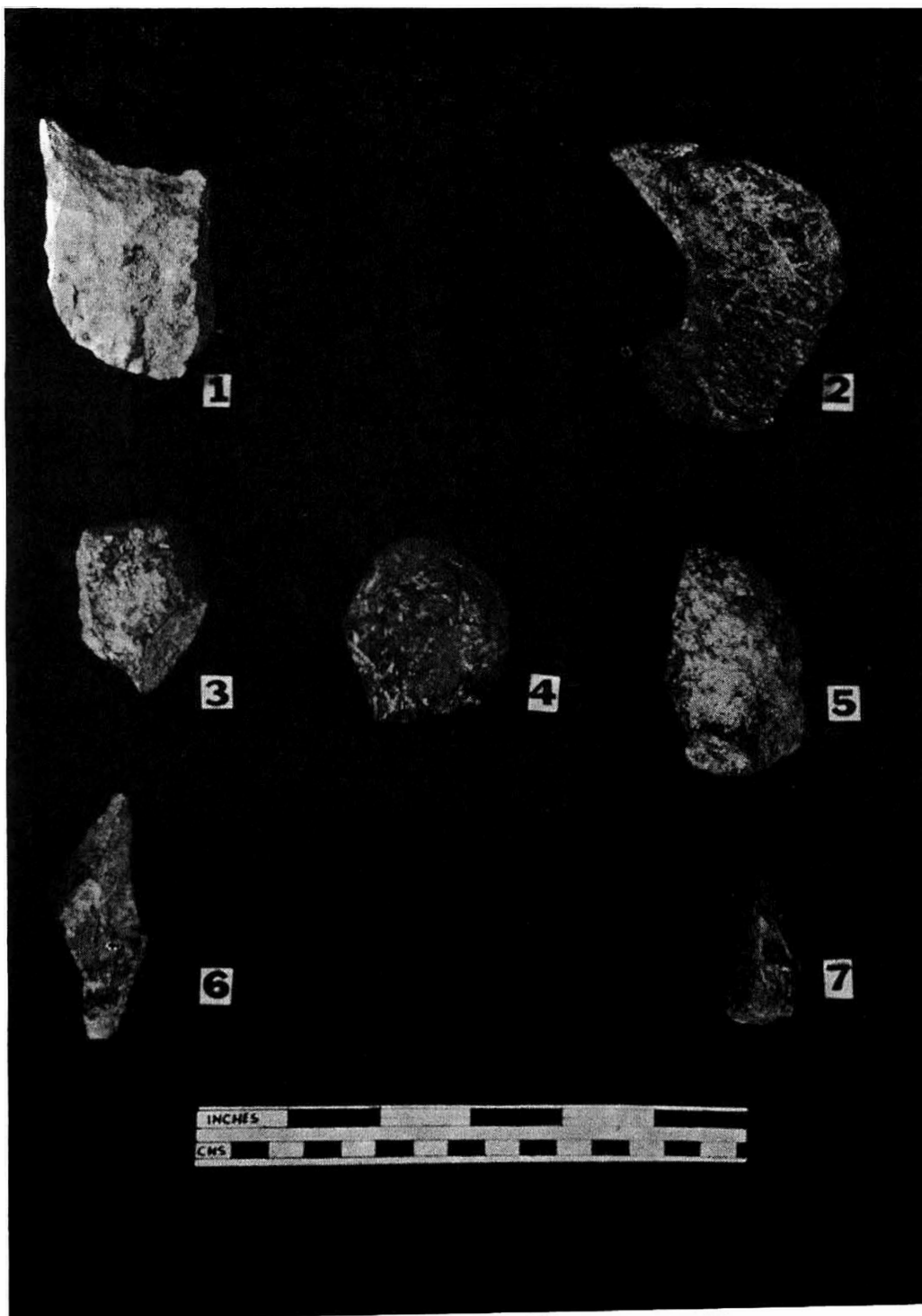
Pl. XVIII — Parkho-darra Cave. Side-view of the trench



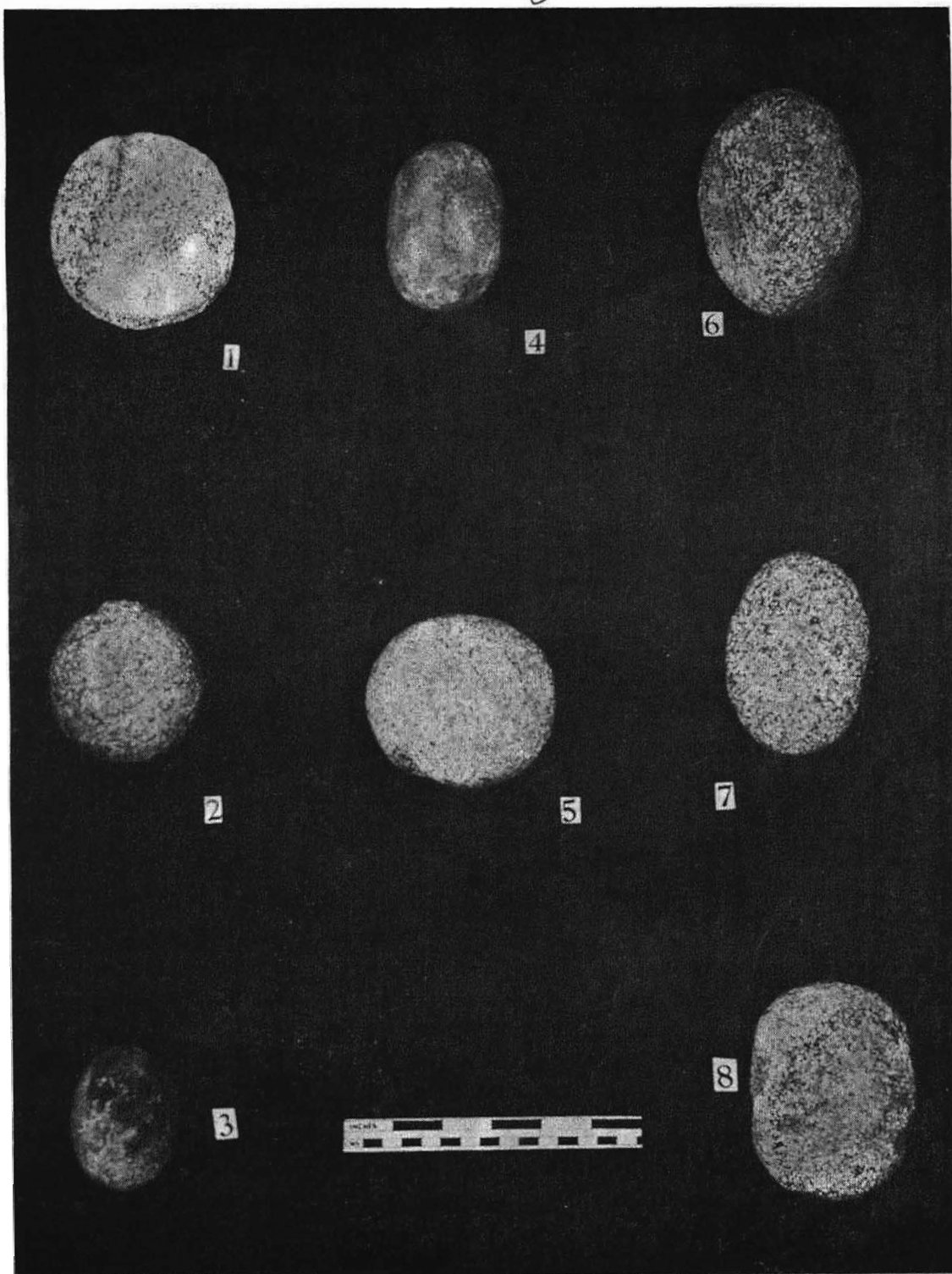
Pl. XIX a — Parkho-darra Cave — Line dividing the layers inside and outside the Cave



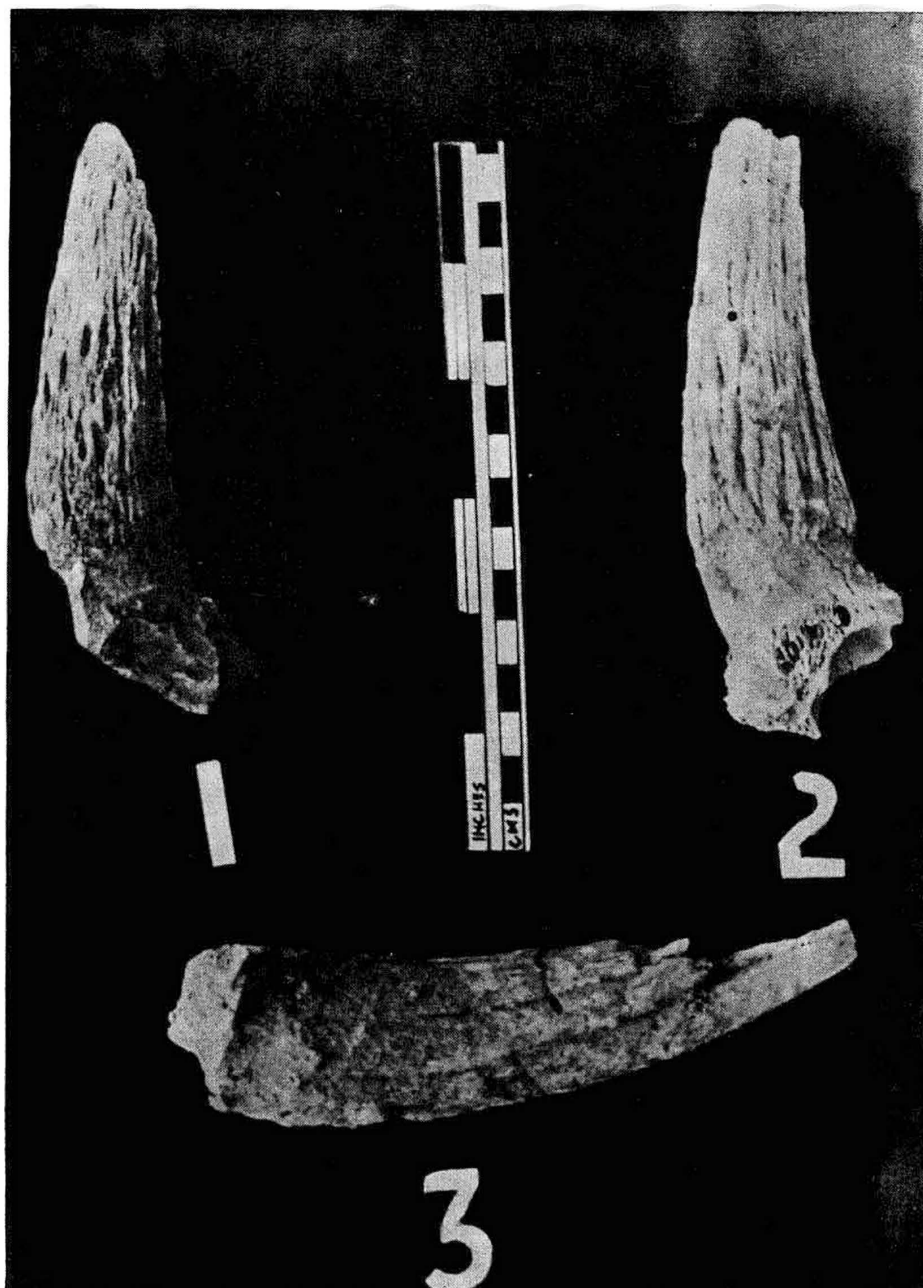
Pl. XIX b — Parkho-darra Cave — Layers dipping away from the back rock



Pl. XX — Schist tools recovered from the cave 1, 2, 3, 6 and 7 points; 4 and 5 scrapers



Pl. XXI — Hammerstones of granite recovered from the cave



Pl. XXII — Parkho-Darra Cave Horns from the excavation

that almost all the quartz was derived from non-lateritized quarries. The period ended with the sudden fall of the cemented boulder from the ceiling. It overlay greater portion of layer 10 and made up layer 9 of period II. The reason for the fall of the cemented boulder may be conceded in some climatic change. One remarkable change is that after this period the red-stained clay makes up the layers of period II, which must have been derived from the red-staining of the upper part of the Younger Loess. It is because of this that almost all the tools in subsequent periods were red-stained.

It is on the top of these boulders that the men of period II settled. It seems that after the fall of the boulders the cave was given up for sometime, or at least the occupation was rather very casual. In fact the bottom of layer 9 revealed no tools at all. But the occupation of the cave continued through all the layers of period II, each layer being separated by a charcoal line. All the layers dip down (Pl. X, X a and b) away from the back of the rock and with them are mixed up several patches of ash and charcoal. The quartz tools are red-stained, though very few at the bottom are of white quartz. Other materials include schist fragments, animal teeth and fractured bones, some being charred. Period II also saw slight sliding of the rock (not shown in the section) from the back of the cave, though this did not lead to actual desertion of the cave.

Period III is a continuation of the stone age material seen earlier, and shows regular occupation with plenty of material in the deposit. Layers consists of reddish clay mixed with good many fragments of limestone. There was also a streak of charcoal lining separating layer 4 from layer 3, and quite an amount of ash was noticed in layer 4. Some of the rubbish ash and charcoal was thrown outside, thus turning the clayey stuff black. The red clay appears to have been derived from the red-stained clay outside. The quartz tools were again red-stained. Other objects found include three animal horns in trench D layer 4 A, hammerstones of granite in trench D layer 4A, bone fragments, animal teeth and tools made of schist.

The next period IV makes a complete break in the material remains.. In this period no regular occupation was observed in the cave, but several pits were found, some of them lined with stones (Pl. XVI a) — all full of ash, charcoal, bones and pot-sherds. One large pit was dug just behind the embankment. The rubbish from these pits were thrown outside making layer 2A of black ashy earth. Some of the stone-lined pits appear to make up hearth. It seems that the cave was used for cooking purposes by the occupiers. Such hearths were also noticed in the lower period as well. The date of this period is determined by the following:

- (i) The find of one copper coin of Kanishka showing the great king in the standing pose on the obverse and Śiva and bull on the reverse.
- (ii) One fragment of a local black polished ware.
- (iii) Rim fragments of a miscellaneous sort and pieces of drinking vessel — all of the Kushana period (See Fig. 25).

On these material evidences period II is dated from circa 2nd century B.C. to 2nd century A.D. Pitched embankment partly falls in this period. It is this period which has been earlier termed "Buddhist". These Buddhists disturbed the earlier

layers in this cave as also in other caves seen in this area. The result of this disturbance, caused by digging holes and pits, mixed up the deposit of the earlier period, and it was very difficult to detect a break between the earlier occupation and the Buddhist period. But wherever it was preserved, it was clearly noticed that an earlier occupation was characterised by whitish clay mixed up with reddish soil. Whenever the clods of this clay were broken, invariably came the fragments of quartz. It is, therefore, reasonable to infer that there was a definite break between period III and period IV.

The topmost occupation period was that of the Buddhists inside the cave. But outside the cave immediately below the ploughed soil there was an interregnum of river-laid alluvium, layer 1A, preceded by a sandy layer, 1B. In this deposit were also recovered some pottery fragments derived from earlier occupation. A pit was encountered in trench E, in which a fragment of a skull (Pl. XV a), lined in a circle of gravels, was found. The pit was dug right from the top proving that the burial was of recent date. This entire deposit has been referred to period V. The layers of this period merge in the pitched embankment suggesting that they are partly coeval with it.

EXCAVATED MATERIALS

Stone Tools

Stone tools found in actual excavation can be broadly divided into three groups:

1. Considerable number of tools of the "flake-blade-and-scraper" type along with cores and numerous waste fragments in three materials: (i) Opaque variety of white or red-stained, quartz is the usual material, (ii) a limited examples of transparent crystal but very fragile, and (iii) only two specimens in chert. It appears that this last material was not available to the cave man. Hence one specimen is re-used again and again.

2. Crude fragments of schist⁷, some of which approach tools of the first group, but a few are unique in this material. They are found in all the levels.

3. River-rolled hammerstones of granite found only in trench D layer 4A, and thus belong to period III.

1. Quartz Tools

Quartz, the most intractable raw material that has been used by the Sanghao Cave man, as it was locally available, makes the preparation of the tools as well as their study most difficult. The material is fragile and the flakes do not make a clean cut. It is very difficult to get a real conchoidal fracture in this quartz. The bulb of percussion is occasionally diffused in the tools. Even the lines of striations are observed with great difficulty. But given this raw material in plenty the

7. Col. D. H. Gordon calls the material "black indurated shale, in *Prehistoric Background of Indian Culture*, Bombay, 1958, p. 19.

Sanghao man had no other choice, and we have to discover the techniques in this raw material and understand technical affiliations with other cultures.

The entire tool complex of Sanghao from period I to III represents a homogeneous technical tradition and follows the same technique throughout. The varieties of tool types diminish in period II, but in period III again they catch up with those seen in period I. The fundamental difference is that in period III the size of the tools is generally smaller than that in period I.

There is plenty of evidence to show that the Sanghao man actually quarried quartz from the local outcrops and brought it into the cave, and here he made tools. Large number of waste fragments scattered in the cave and in the rubbish deposit outside bear testimony to this fact. What the actual process was in making the tools is a question of inference. Dr. B. Allchin⁸ refers to a method employed by the Andaman Islanders in tackling quartz. "They are reported to have fractured quartz pebbles by placing them in the fire until they were red hot, and then removing them and striking them immediately with another stone. In this way the quartz could be shattered into small sharp fragments." But at Sanghao no quartz pebbles were used as raw material. The evidence shows that actual quartz nodules were brought from the quarries only a few hundred feet away into the cave and tools made here. It is quite possible that here again the nodules were heated before striking, but nothing of the sort can be inferred from the tools. Though charcoal and ash as well as the evidence of hearth are known in the excavation, still it appears that they were more used for cooking than for the manufacture of tools. The evidence of charred bones from the excavation goes to support this inference.

The Sanghao tool complex is predominantly a flake industry though a small proportion of core tools is also present in it. The tools show a technical tradition which comes closest to the Levallois-Mousterian making technique of Europe and Western Asia. In terms of Indo-Pakistan prehistory it is referable to the Middle Stone Age industry as the following analysis will show. (See also below under comparison and conclusion). No statistical calculation of the tools is given in this report as the excavation is still incomplete. However, a preliminary account of the main types and varieties of the tools is included here so as to give an idea of the main industry associated with these cave dwellers. The industry may be divided into two sub-groups: A. Core tools, and B. Flake and blade tools.

A. Core Tools

Broadly speaking there are four varieties of core tools so far detected in the excavation: (i) Discoidal cores, (ii) Tortoise cores, (iii) "Fluted cores", and (iv) unrecognizable cores which have been so much flaked that at the end they are thrown as waste materials. The last variety was the greatest in number probably because of the very nature of the raw material. They have not been illustrated here. All the other three varieties show careful preparation of the striking platform, some of them being unifaceted as in variety (iii) and others being multifaceted. The cores are further worked to produce edged tools of different varieties

8. 'The Indian Stone Age Sequence', in *Journal of the Royal Anthropological Institute*, Vol. 93, 1963, p. 221.

mainly reduceable into (a) discoids, (b) chopping tools or probably small hand-axes. The latter are of two sub-varieties—one group has a clean platform on the top and the other has a narrow rough end. And (c) scrapers. Long blade flakes appear to have been struck from fluted cores, but their number is few. The greatest number of scrapers is produced from tortoise cores. It is from them that we also get triangular points. Many small varieties of points are struck from discoidal cores in the process of making other tools. By striking away one side of these cores (See Fig. 10. Nos. 1-2 & 3) we get one variety of tools which may be used either as chopping tools or more preferably as scrapers. From tortoise cores we get another variety (Fig. 9, nos. 2 & 3), which may be included among semi-circular scrapers—a type which appears to be a predecessor of the crescents or lunates of the microlithic period.

(i) *Discoidal cores:-*

(a) Fig. 7, No. 1. A discoid of red stained quartz worked on both faces into a rough round shape. Marks of use at the edge. Trench B layer 3.

(b) Fig. 8, No. 1 — chopping tool or hand axe, slightly red-stained, has a platform at the top end. The other end is worked into a cutting edge, worked bifacially. It belongs to the first sub-variety. Trench D layer 4 A.
Fig. 8, No. 2 — chopper, has a single platform at the top end. Long flakes taken out from both the faces and then the edges retouched. The working end is slightly pointed, red-stained, belongs to the first sub-variety. Trench A, layer 11.

Fig. 8, No. 3 — chopping tool or hand axe with a platform at the top end, rectangular in section. One face shows a single flake struck from the platform but the other has a subsidiary flake removed from the lower half, thus producing an almost “bivelled” edge. It belongs to the first sub-variety. The term “bivelled” used here is not very satisfactory as it is a late technique seen in the neolithic tools of Eastern Asia.⁹ The idea here is to describe a secondary flaking with a single snap worked from the lower half of the body towards the cutting edge in the process of sharpening. This is seen in a number of tools at Sanghao. It is only in this limited sense that the term “bivelled” is used here.

Fig. 7, No. 2 — handaxe with the top end narrow, secondary flaking on the body to produce the edge, red-stained. It belongs to the second sub-variety. Trench C layer 3.

Fig. 7, No. 3 — handaxe retaining the platform at the top end, secondary flaking on the body, red-stained. It belongs to the second sub-variety. Trench B layer 3.

Fig. 7, No. 4 — smaller variety of handaxe, much worked on the body, red-stained. It belongs to the second sub-variety. Trench B layer 3.

(c) Fig. 9, No. 1 — scraper, almost semi-circular with a flat top. The edge is produced by secondary working. Trench B layer 11.

9. A. H. Dani: *Prehistory and Protohistory of Eastern India*, Calcutta, 1960, p. 47.

Fig. 9, No. 2 — smallest variety of the above, red-stained, Trench D layer 7A.

Fig. 9, No. 3 — medium sized variety of the above. Trench A layer 12.

Fig. 9, No. 4 — scraper, slightly longish in shape, red-stained, much worked on the body. Trench B layer 3.

(ii) *Tortoise Cores.*

(a) Fig. 10, No. 1 — core showing multi-faceted platform, red-stained. Trench B layer 3.

Fig. 10, No. 2 - smaller variety of the above, red-stained. Trench B layer 3.

(iii) *Fluted Core.*

Fig. 10, No. 3 - A fluted core with a platform on the top, and flakes struck longitudinally. The underface is broken. It is because of this break that it looks like a tortoise core, but the other face which is rounded shows clear long flake scars. 'For this reason alone it is termed fluted core. Trench A layer 11.

B. Flake and blade-flake tools

The flake tools, as pointed out above, are a miscellaneous assortment particularly because quartz does not give good flakes. In the course of flaking or trimming the core many waste products are found as a natural outcome. All these waste products are not completely abandoned. The use marks on many of them indicate that they were actually used but the manner of their use is difficult to determine. It is particularly difficult to resolve them into one or the other typical shape. They may be called freaks. The flake scar on them is not at all clear. They might have been used as scrapers or points. These have not been illustrated at all.

There is quite a good number of tools on which deliberate flaking is writ large. All the flakes are struck from a prepared core by a single blow with the result that the lower face generally shows one clean cut though the bulb of percussion is sometimes diffused. The flakes thus removed are then taken up for further working. The first flake scar forms the underside of the tool and the secondary flakes are removed from the upper face. In the case of broad scrapers a single blow from the middle of the body towards the cutting edge or a longitudinal flake across the body produces a joint at the cutting edge. Sometimes two or three flakes are struck from the upper face to the same end. In the case of side scrapers sometimes a fine strip is taken out to produce the working edge. In a few cases notches are seen at the lower end for purposes of hafting, and in some the back is blunted by transverse flaking.

There is a good number of tools which cannot be included under the category of scrapers as they do not show clear scraping edge, though they are produced by

the same process. Their dominant character is the pointed end, though the point may be the result of freak. Such tools have been included under the term "points". Within this group have also been put awls, gravers and burins, which show an advanced technique of backward stroke from the point downward. This technique has not so far been noticed in trench D layer 7 A, but no definite conclusion can be drawn from this in view of the small area of the dig at the lowest depth. From period I onwards the technique is well evidenced. In the first case we get triangle or triangular points, particularly Fig. 16, No. 4 shows two long flakes produced by fine workmanship at the sides. In the other examples, Fig. 15, Nos. 4 and 5, notches are given either on one side or on both sides to produce the boring point. Still another, Fig. 14, No. 6, shows a clear backward stroke to produce the graver or burin. The largest number of gravers or burins are found in period 1, and their number is reduced as we go upwards. This remark holds good on the basis of the present excavation only. Its correctness will be verified in the second season work. Some of the tools have long tangs, Fig. 14, No. 7; Fig. 12, No. 6; others have notches on one side, Fig. 12, Nos. 1-3; and still others have notches on both sides, Fig. 15, No. 6. We have also got triangles with a hollow base, Fig. 16, No. 7.

Thus the flake tools can be broadly classified under two main categories: (a) scrapers and (b) Points, the latter category including awls, gravers and burins. The scrapers include blade or blade-flakes and scraper-cum-points. Each of them can be further sub-divided into following sub varieties:

a) *Scrapers.*

- (i) Blade-flakes - These are almost parallel sided flakes struck from prepared cores (Fig. 13, No. 1). Some of these are further worked into points (Fig. 15, No. 7).
- (ii) Leaf-shaped scraper (Fig. 13, No. 2), which sometimes ends in a point. This particular tool has two platforms and the edge shows marks of use.
- (iii) Side-scrapers have several sub-varieties:
 - Straight-edged, Fig. 13, No. 7, with blunted back, the edge being produced by a thin flake strip removed from the side.
 - Convex edged, Fig. 13, Nos. 4 and 8, with the original platform serving as the blunted back.
 - Convex edge with a notch at the lower edge, Fig. 12, Nos. 1 and 2.
 - Hollow scraper. Fig. 20, No. 11, is concave on one side.
 - Double hollow scraper, Fig. 13, No. 6, the hollow being produced by secondary retouch.
 - Aslant edge scraper, Fig. 13, No. 5, the aslant edge being a by-product of the usual flaking. It is a freak.
- (iv) Notched scrapers show single (Fig. 12, Nos. 1-3) or double (Fig. 15, No. 6) notches at the lower end, the notches being produced by secondary retouch.

- (v) End scrapers either have narrow butt end and show the cutting edge on the other end produced by secondary flaking from the middle of the body (Fig. 14, No. 3), or are almost rhombos in shape (Fig. 14, No. 2). In these cases the original flake scar serves as the platform for the secondary flaking.
- (vi) Fan-shaped scraper (Fig. 12) Nos. 4 and 5 shows a single flake scar on the lower face but has several flakes taken out from the other face. The name is derived from the shape.
- (vii) Semi-circular scraper (Fig. 12, Nos. 7-9) has a single flake taken out from the lower face and number of longitudinal flakes from the other face. They are blunted. These are almost like latter day lunates but are bigger in size and do not show any retouch.
- (viii) Discoids with almost circular edge but having a platform on the top (Fig. 24, No. 1).
- (ix) Scraper-cum-points are found both in large and small sizes. Fig. 14, No. 4 has the point made by backward stroke.
- (x) Tanged scraper (Fig. 12, No. 6) has almost straight cutting edge. It could as well be used as a transverse arrow head, if such a use was known.

(b) *Points.*

- (i) Awls or borers with a single notch on one side only, Fig. 15, No. 1.
- (ii) Awls or borers with a double notch on either side of the point, Fig. 15, Nos. 4 and 5.
- (iii) Gravers or burins, Fig. 16, Nos. 1-3, are almost triangular in shape, each showing a backward stroke. We also have a long sub-variety (Fig. 14, Nos. 5 and 6) made on blade-flake.
- (iv) Tanged point, Fig. 14, Nos. 7-8, No. 8 is of slightly broader sub-variety.
- (v) Triangular point — Fig. 16, No. 4 is a good example.
- (vi) Notched point — Fig. II, No. 5 shows two notches at the lower end but the point is very crude.
- (vii) Triangular point with a hollow base, Fig. 16, No. 7. The point is produced by the junction of two flakes on the upper face.
- (viii) Narrow point in period III produced by minute flaking in the upper face, Fig. 22, No. 1.
- (ix) Rough and crude scraper-cum-points in period III, Fig. 23.
- (x) Long point in a chert blade. Only one example in period III, heavily used, Fig. 21, No. 10.

Catalogue of the illustrated tools—**Trench D, Layer 7 A**

Fig. 11.

- No. 1—semi-circular scraper with blunted arc.
- No. 2—Fan-shaped scraper.
- No. 3—A rough flake showing marks of use on one side.
- No. 4—Another freak used as an end scraper but much flaked on the other face.
- No. 5—Double notched point, the notches at the lower end.
- No. 6—Point of unusual shape, the point produced by convergent flaking.
- No. 7—End scraper (edge downward), the edge being produced by striking a flake from the middle of the upper face.

Period I

Fig. 12.

- Nos. 1-3—Convex scraper with a single notch. All from trench A layer 11. Probably knife blades.
- Nos. 4-5—Fan-shaped scraper. No. 4 from trench A layer 11.
- No. 5—from trench A layer 12.
- No. 6—tanged scraper from trench A layer 12.
- Nos. 7-9—semi-circular scrapers. 7 and 8 from trench A layer 11 and No. 9, red-stained, from trench A layer 12.

Fig. 13.

- No. 1—blade-flake from trench A layer 12.
- No. 2—Leaf-shaped flake, from trench A layer 11.
- No. 3—convex side scraper from trench A layer 10.
- No. 4—curved scraper (a sub-variety of convex type) from trench A layer 10.
- No. 5—Double-sided aslant scraper from trench A layer 11.
- No. 6—Double-sided hollow scraper from trench A layer 11.
- No. 7—straight-sided side scraper, slightly red-stained, trench A layer 11.
- No. 8—convex side scraper from trench A layer 11.

Fig. 14.

- No. 1—rhombos-shaped end scraper, red-stained, trench A layer 11.
- No. 2—rhombos-shaped end scraper, red-stained, trench A layer 10.
- No. 3—end scraper from trench A layer 11.
- No. 4—Scraper-cum-point from trench A layer 11.
- Nos. 5-6—graver or burin on a blade flake, both from trench A layer 11.
- Nos. 7-8—Tanged point. No. 7 is long and No. 8 is broad. Both from trench A layer 12.

Fig. 15.

- No. 1—Borer notched on one side, trench A layer 11.
Nos. 2-5—borers notched on both the sides. No. 2 from trench A layer 11, No. 3 from trench A layer 12. These are of broad base. Nos. 4 and 5 are from trench A layer 12. They have a long body.
No. 6—borer as No. 1. Trench A layer 11.
No. 7—Retouched point, slightly red-stained. Trench A layer 12.

Fig. 16.

- Nos. 1-3—burins or gravers. Nos. 1 and 3 are from trench A layer 11 and No. 2 from trench A layer 12.
No. 4—triangular point from trench A layer 11.
Nos. 5 and 6—gravers or burins. No. 5 slightly red-stained from trench A layer 12 and No. 6 from trench A layer 11.
No. 7—triangular point with a hollow base from trench A layer 11.

Period II

Fig. 17.

- Nos. 1 and 2—almost semi-circular scraper, the scraping edge being produced by secondary working. The original platform serves as the flat base. Both red-stained and from trench D layer 5 A.
No. 3—straight-edged side scraper, slightly red-stained, from trench A layer 5.
No. 4—double-sided scraper from trench A layer 5.
No. 5—fan-shaped scraper, red-stained, trench A layer 9.
No. 6—tanged scraper with edge almost straight, red-stained, trench A layer 9.
No. 7—Semi-circular scraper with the arc blunted from trench A layer 9.
No. 8—Scraper-cum-point, scraping edge on both sides, red-stained, trench, A layer 7.
No. 9—Scraper-cum-point, straight edge, back blunted, point produced by back stroke, red-stained, trench A layer 6.

Fig. 18.

- Nos. 1-9—all are triangular points. No. 5 is of chert and comes from trench A layer 9. The remainder are quartz, all red-stained. Nos. 2, 3 and 9 from trench D layer 5 A. No. 1 from trench B layer 7. No. 6 from trench B layer 8. Nos. 4 and 8 from trench A layer 7 and No. 7 from trench A layer 6.

Period III

Fig. 19.

- No. 1—blade-flake used as a side-scraper. No retouch, trench D layer 4 A.

- No. 2—Blade-flake used as a side-scraper. No retouch, red-stained, trench C layer 3.
- No. 3—Scraper-cum-point, red-stained, trench D layer 4 A.
- No. 4—flake, trench A layer 3.
- No. 5—Parallel-sided flake, trench D layer 3 A.
- No. 6—A flake, red-stained, trench B layer 3.
- No. 7—A side-scraper, red-stained, trench C layer 4.
- No. 8—Side-and-end scraper, secondary working at the end-side, trench C layer 4.
- No. 9—End scraper, rectangular in section, almost like a chisel, red-stained, trench D layer 3 A.
- No. 10—A flake, trench A layer 3.
- No. 11—side-scraper (knife blade) with a slight tang, red-stained, trench B layer 3.
- No. 12—same as No. 2 above, red-stained, trench B layer 3.

Fig. 20.

- Nos. 1-3—semi-circular scraper, back blunted. No. 1 from trench B layer 3, No. 2 from trench A layer 3, and No. 3 from trench D layer 4 A.
- No. 4—End scraper with the cutting edge slightly aslant, trench A layer 3.
- No. 5—side-and-end scraper with its original platform serving as the flat top, trench A layer 3.
- No. 6—End scraper, almost semi-circular shape, back blunted, trench A layer 3.
- No. 7—Side-scraper with a notch for the haft (knife-blade?), red-stained, trench A layer 3.
- No. 8—similar as No. 7 but shows re-working of the edge, red-stained, trench A layer 3.
- No. 9—Similar as No. 8, trench A layer 3.
- No. 10—Leaf-shaped scraper, no retouch, trench B layer 3.
- No. 11—Hollow scraper, red-stained, no retouch, trench A layer 3.
- No. 12—Hollow scraper-cum-point, red-stained, trench A layer 3.
- No. 13—Hollow scraper, no retouch, trench A layer 3.

Fig. 21.

- No. 1—Graver or burin, red-stained, trench A layer 3.
- No. 2—Graver or burin, red-stained, trench B layer 4
- No. 3—Triangular point, trench C layer 3.
- No. 4—Graver or burin, trench B layer 3.

- No. 5—Triangular point, trench B layer 3.
- No. 6—Triangular point, trench C layer 4.
- No. 7—Triangular point, red-stained, trench A layer 4.
- No. 8—Graver or burin, red-stained, trench B layer 5.
- No. 9—Triangular point, trench B layer 3.
- No. 10—Chert blade, re-used as a point, heavily used, trench D layer 4 A.

Fig. 22.

- No. 1—A point having a single flake scar on the lower face & converging flake scars on the upper with a central ridge, red-stained, trench A layer 3.
- No. 2—Triangular point, no retouch, trench A layer 3.
- No. 3—Triangular point, no retouch, trench B layer 3.
- No. 4—Side scraper with a single notch at the lower end, red-stained, trench A layer 3.
- No. 5—Graver or burin, with double notch at the lower end, red-stained, trench A layer 3.
- No. 6—Triangular point, red-stained, trench A layer 3.
- No. 7—Triangular point, trench A layer 3
- No. 8—Triangular point, red-stained, trench A layer 3.
- No. 9—Triangular point, trench C layer 4.

Fig. 23.

- Nos. 1-4—All side scrapers of rough type having pointed ends. They are of very large size and all of them red-stained. No. 1 from trench B layer 3. No. 2 from trench D layer 3 A. No. 3 from trench B layer 3 and No. 4 from trench A layer 3.

2. Schist Fragments and Tools

(Pl. XX and Fig. 24).

Throughout the excavation from top to bottom in the cave large number of schist and limestone nodules were recovered. Some of them were used for lining the pits and others were definitely used for making rough ovens as they showed burning on the surface. A few of them might have been used as a ground base for breaking bones and even for hammering the quartz into pieces or flaking. Attempt was also made to turn a few hard schist stones into tools but the success was rarely achieved simply because it is difficult to get the desired effect in this stone. The material shatters into pieces on the application of a blow. We cannot expect any conchoidal fracture in this stone. Even then we get large number of deliberately broken fragments, and some of them have pointed ends. They may be treated as freaks as they do not readily show the usual technique known in the case of other tools. But the quantity in which they are present and all making

some sort of a pointed end along with a few scrapers convince one that the cave dwellers, who were so short of good raw material, probably tried their hand in using this stone as well for their limited variety of tools. Whether we include them under the category of points or not, we must give them their due place in the life of the Sanghao man. Selected specimens are illustrated here and drawings of only two tools are given. In period I recognizable tools are few and far between, but good specimens come from periods II and III. Wherever recognizable, all such tools are made on flakes, if they can be called flakes. The clearest examples are illustrated in Fig. 24:-

No. 1—(Pl. XX, No. 4)—A scraper of schist found in trench A layer 7, almost round in shape but for the preparatory platform. It is struck from a prepared disc core by a single blow. Hence the lower face shows one clean cut and the platform is preserved on the top. From the upper face three longitudinal flakes are struck and then its lower half is trimmed by secondary working to produce the scraping edge. The flake scars are so clear that no one can doubt the genuineness of the tool. This is the most convincing example.

No. 2—(Pl. XX, No. 3, upside down in the photograph)—scraper-cum-point, found in the cave, trench A layer 7. A single rough flake scar on the lower face struck from a prepared core. The upper face shows flakes taken out from the sides, and the point is made by the convergence of two flakes leaving a ridge in the middle.

Pl. XX, No. 1—Scraper-cum-point. The scraping edge is concave at the top, produced by secondary flaking. The sides show further flaking. The shape is a freak. Trench B layer 11.

Pl. XX, No. 2—A point of almost crescentic shape with notches at the lower end. The shape and the point are both worked by secondary working at the sides. Trench A layer 7.

Pl. XX, No. 5—A flake almost triangular in shape. Trench D layer 7 A.

Pl. XX, No. 6—A tanged point of peculiar shape. The point is produced by the convergence of two flakes meeting on a ridge in the middle. Trench B layer 11.

Pl. XX, No. 7—A point showing a single flake scar on the lower face and two flake scars meeting on a ridge. Trench A layer 6.

The techniques followed in the case of these schist tools appear to be the same as in the case of the quartz. The preparation of the core is also evidenced by them. The points and the edges are also made by secondary working. Only in one tool fine workmanship is attested (Fig. 24, No. 1). The selection of this poor raw material is difficult to account.

3. Hammerstones and anvils (Pl. XXI)

One dozen hammerstones were found with three pieces of horns (Pl. XXII) in trench D layer 4 A. All the stones are river-rolled pebbles of granite — a variety

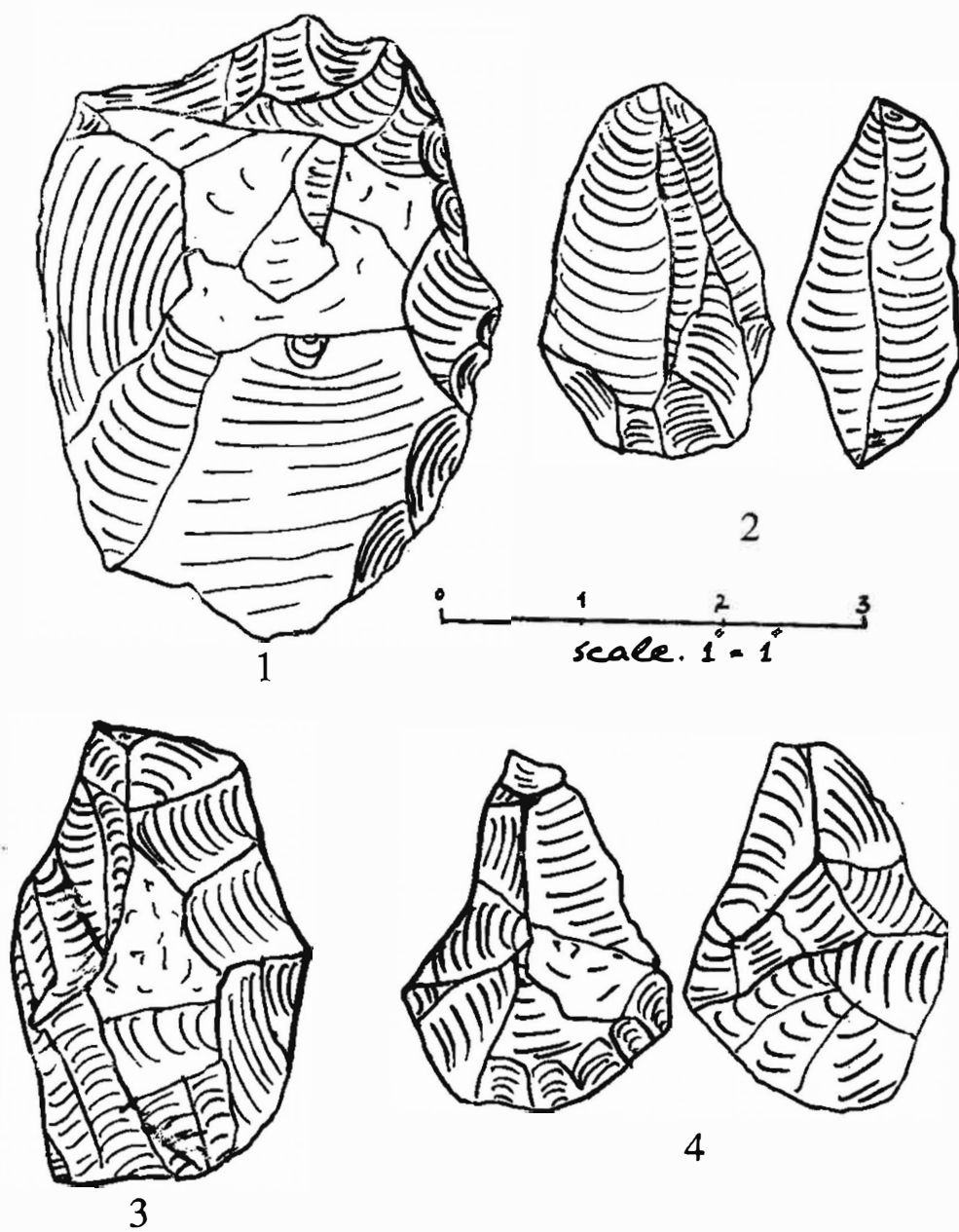


Fig. 7



1.A



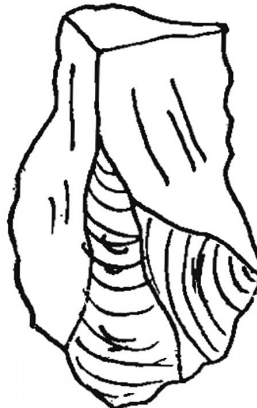
1.B



1.C



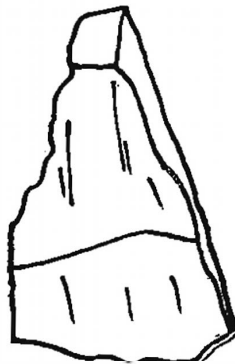
2.A



2.B



2.C



3.A



3.B



3.C

Fig. 8

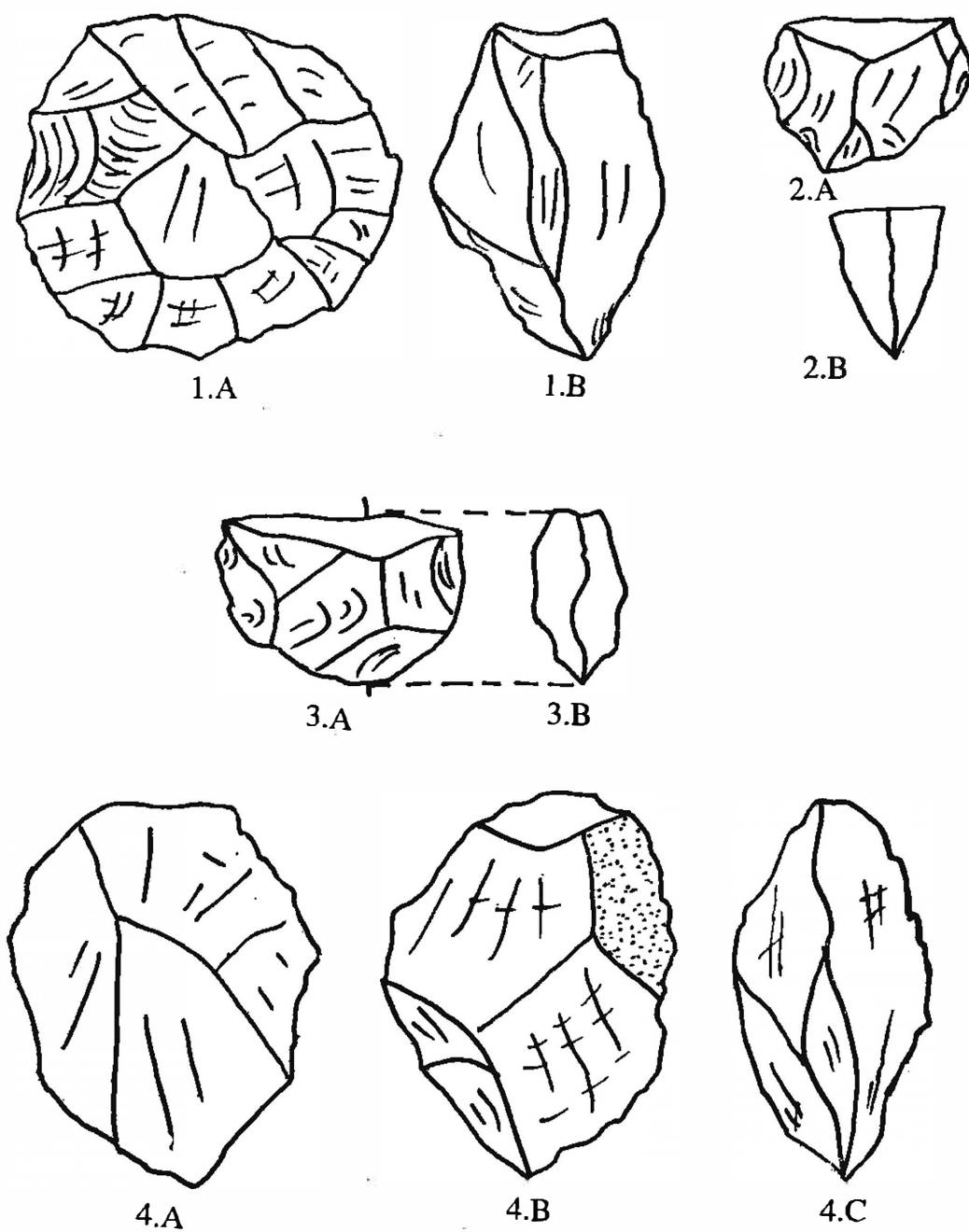


Fig. 9

DANI

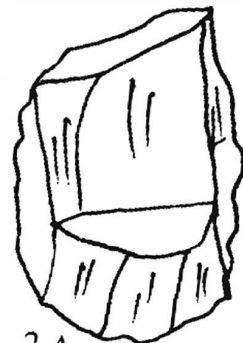
(ANCIENT PAKISTAN)



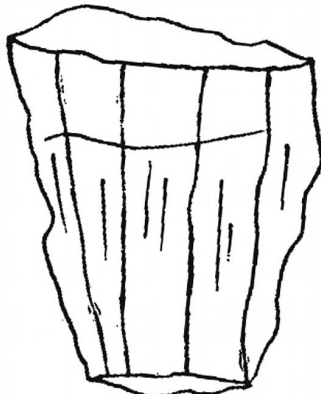
1.A



1.B



2.A



3.A



3.B



2.B

Fig. 10

Trench D Layer 7A

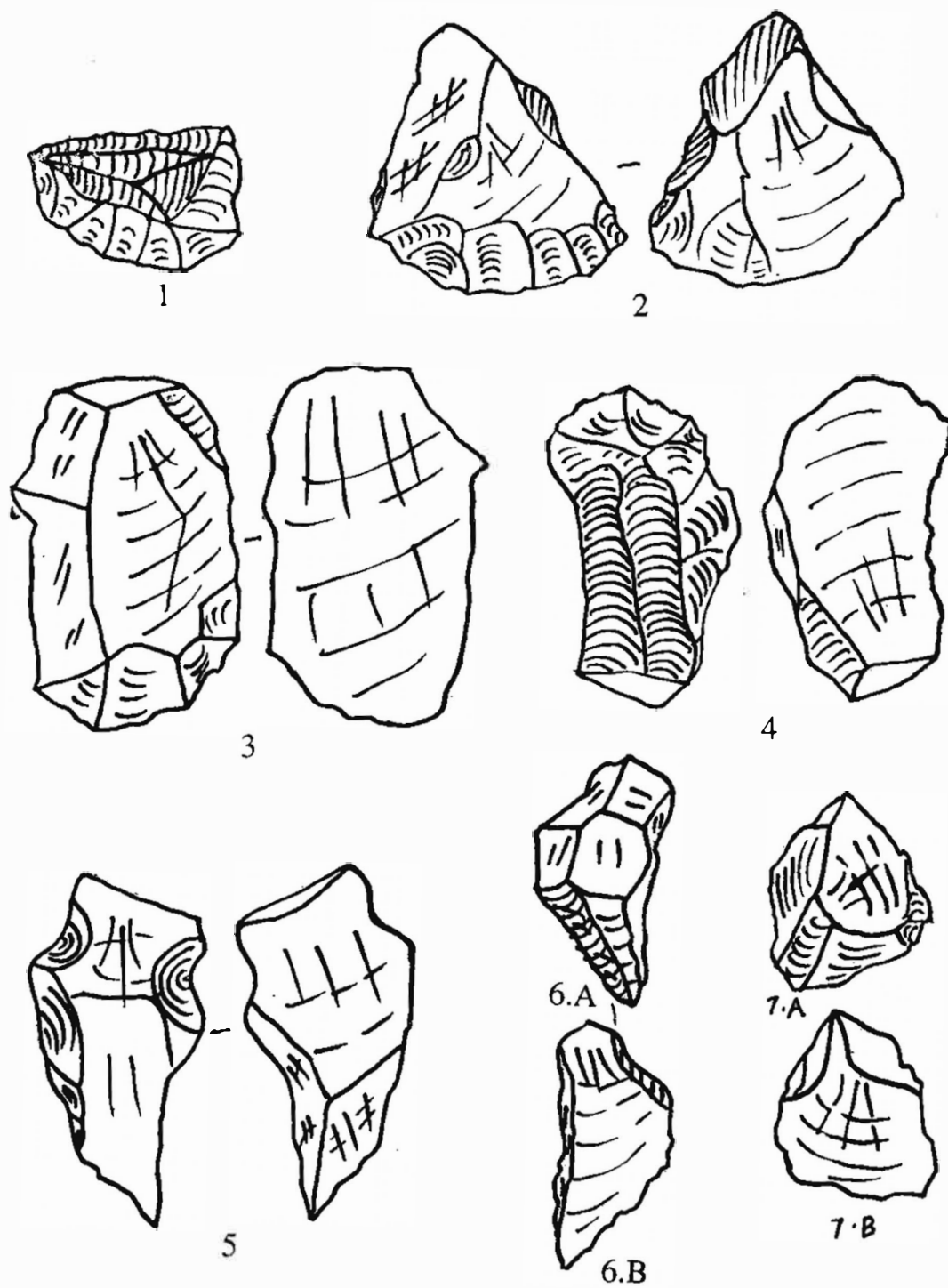


Fig. 11

Period I

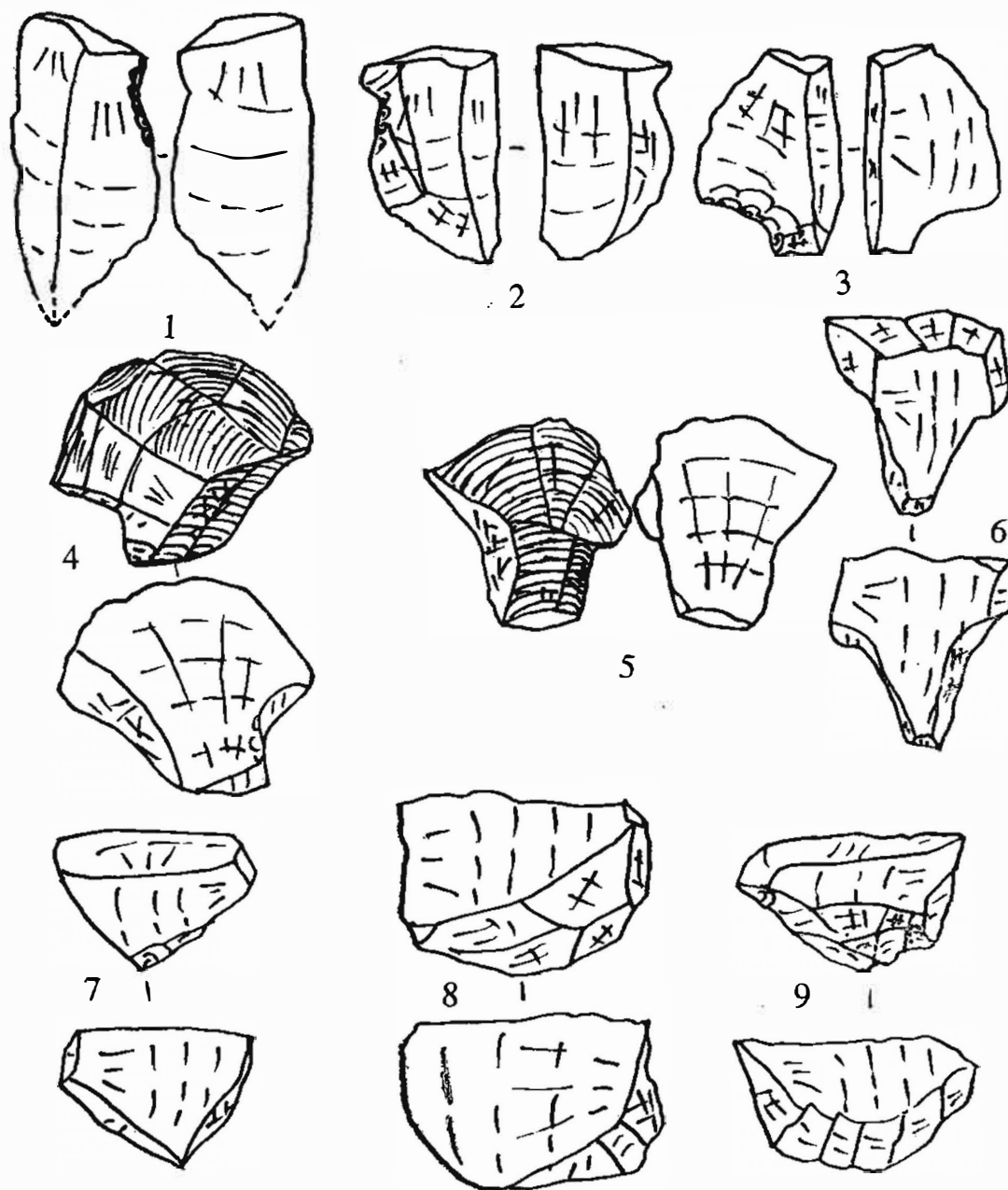


Fig. 12

Period I

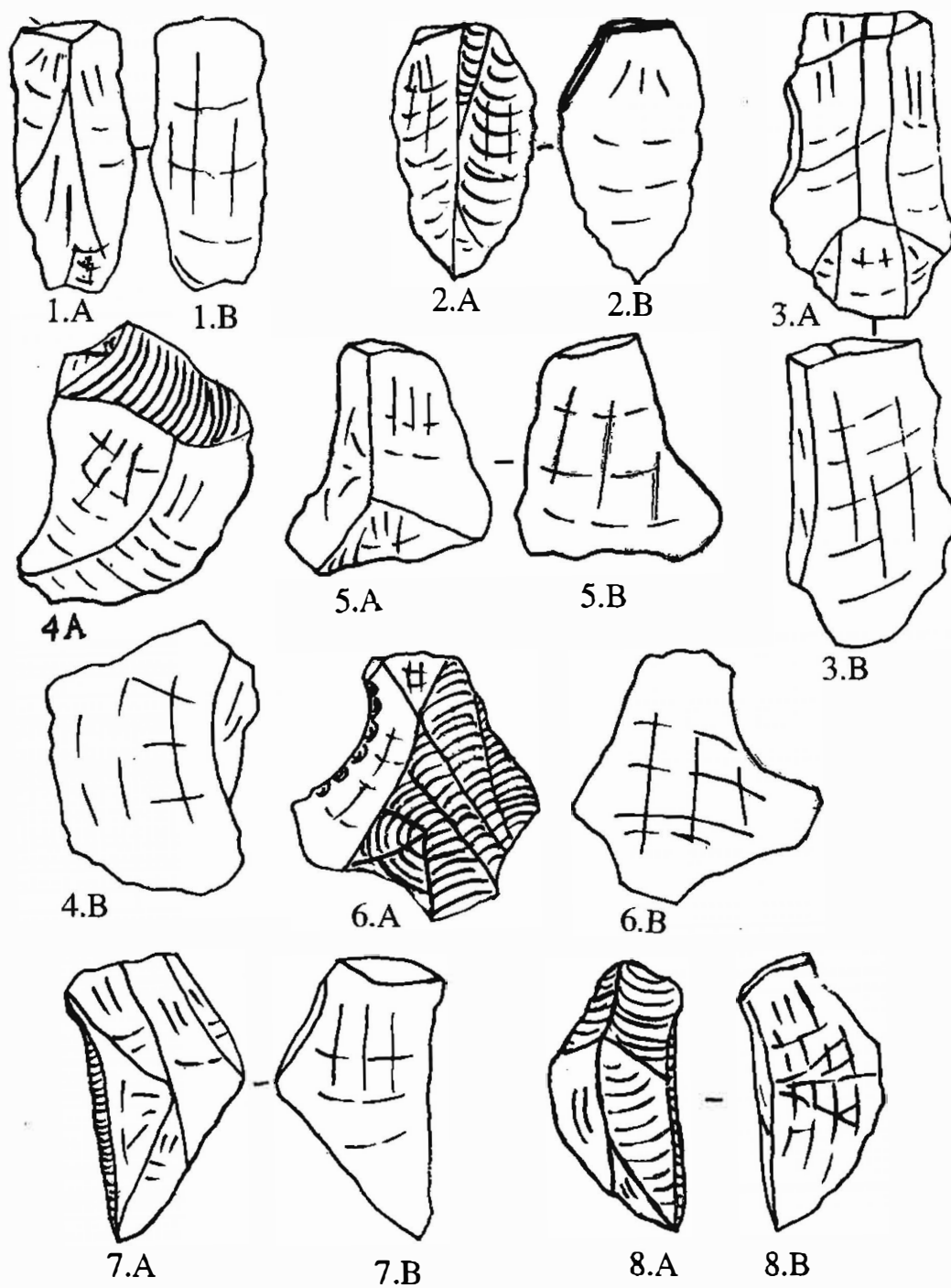


Fig. 13

Period I

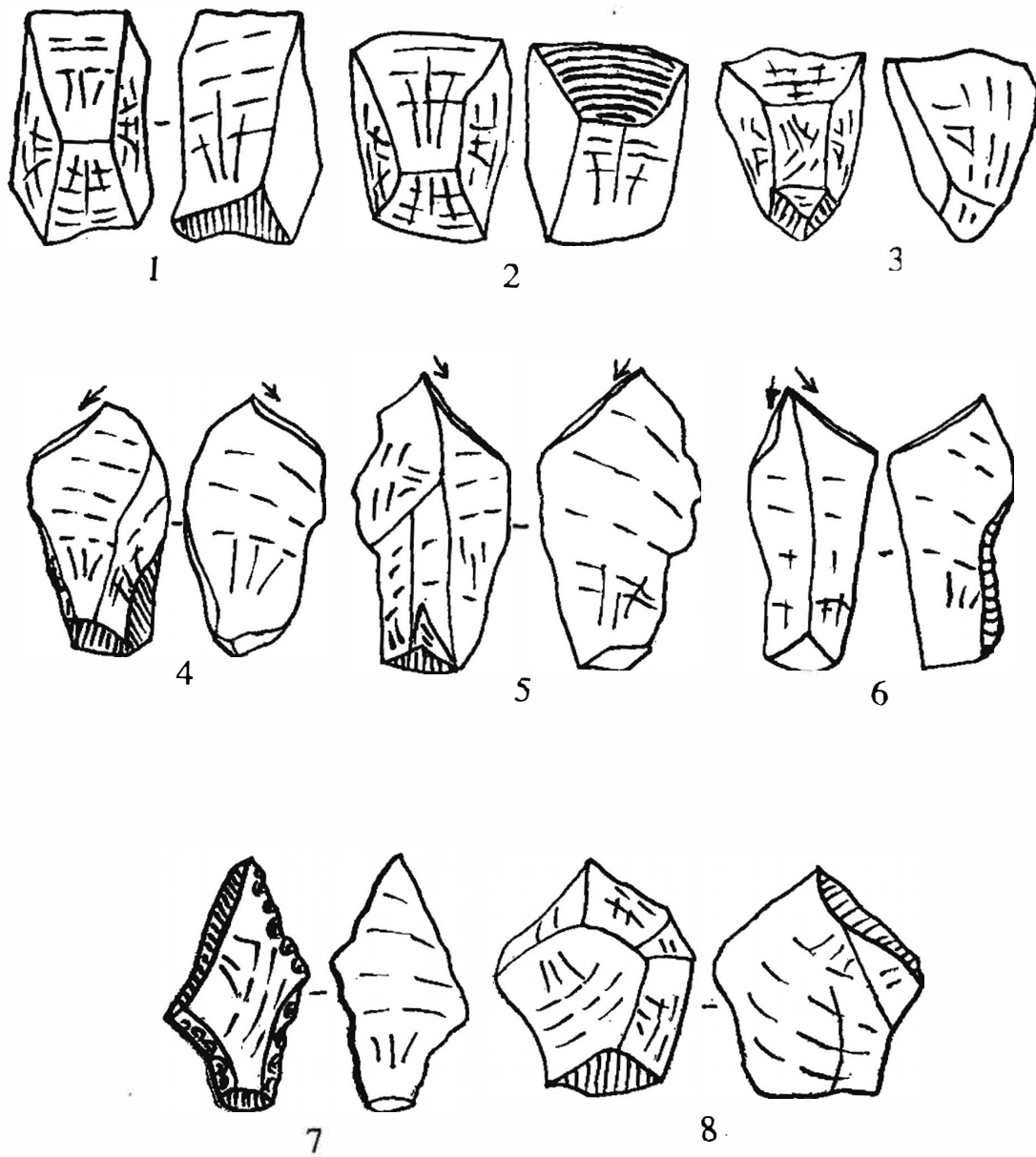


Fig. 14

Period I

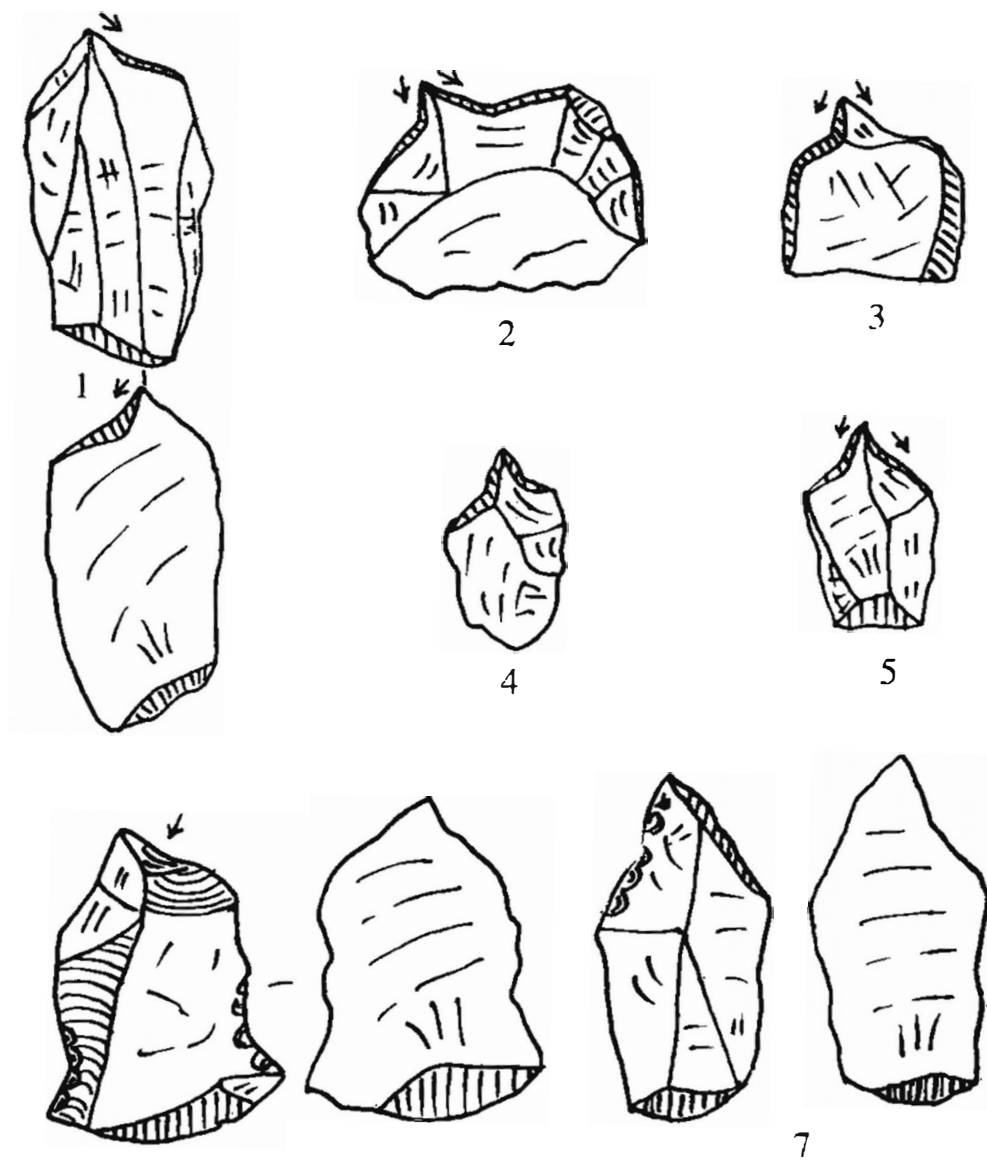


Fig. 15

Period I

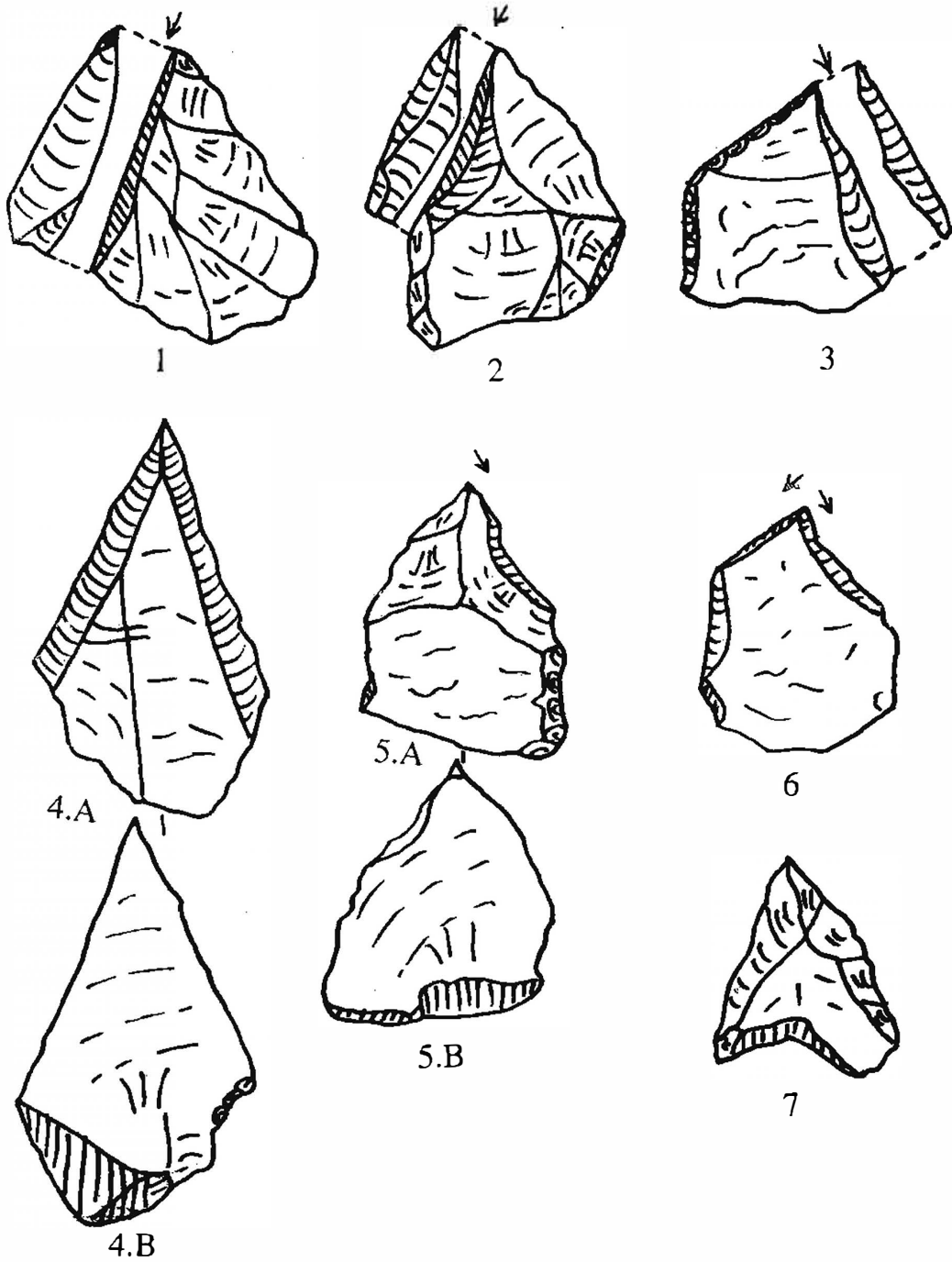


Fig. 16

Period II

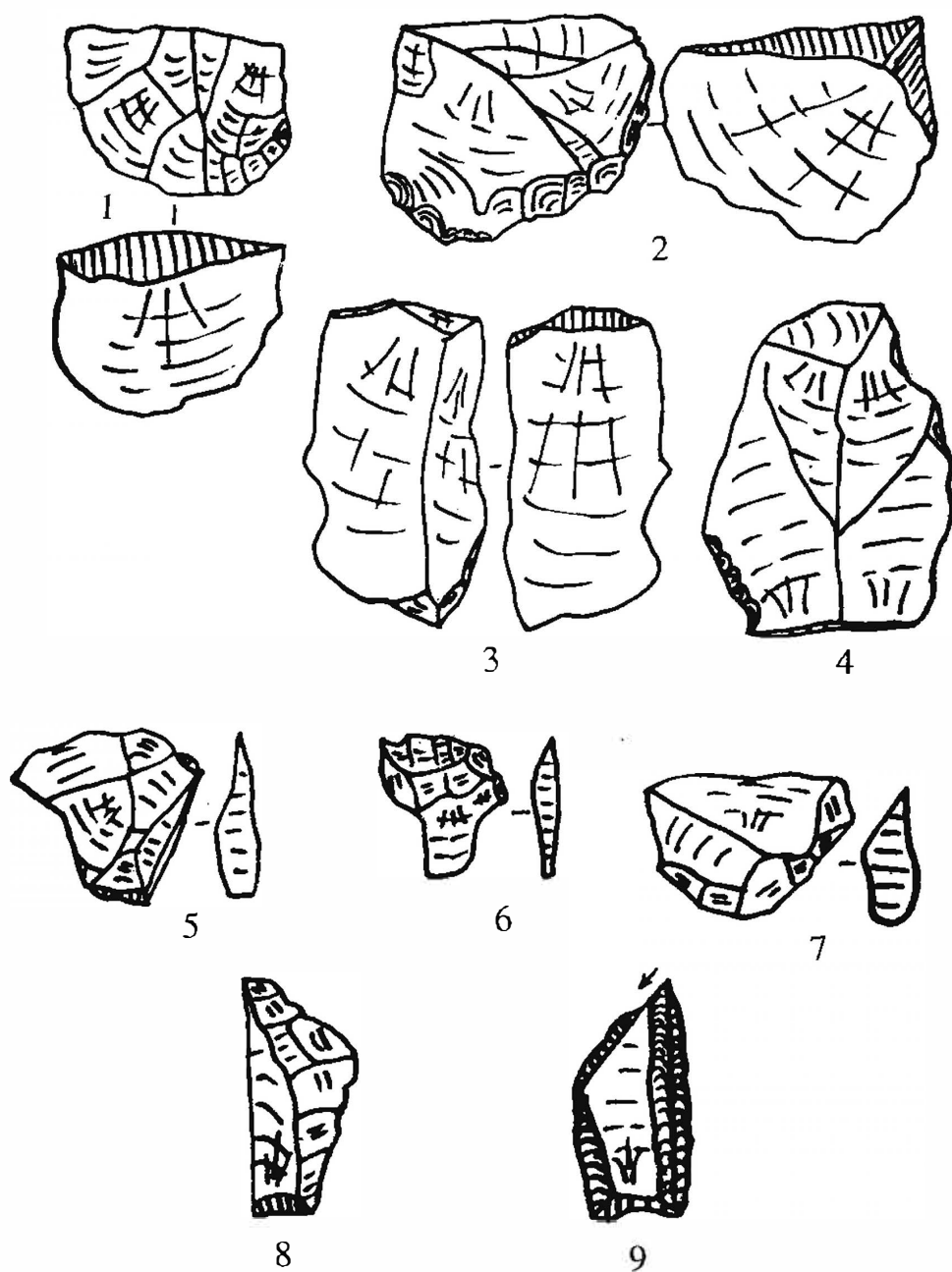


Fig. 17

Period II

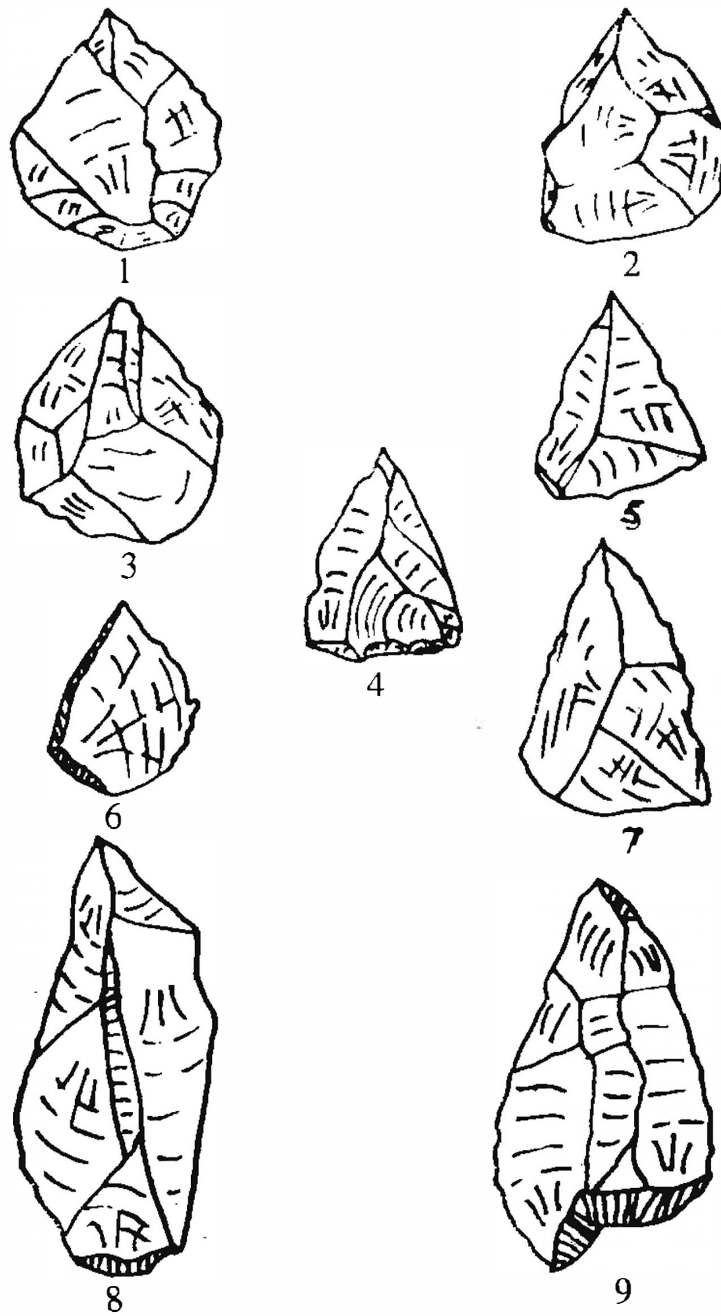


Fig. 18

Period III

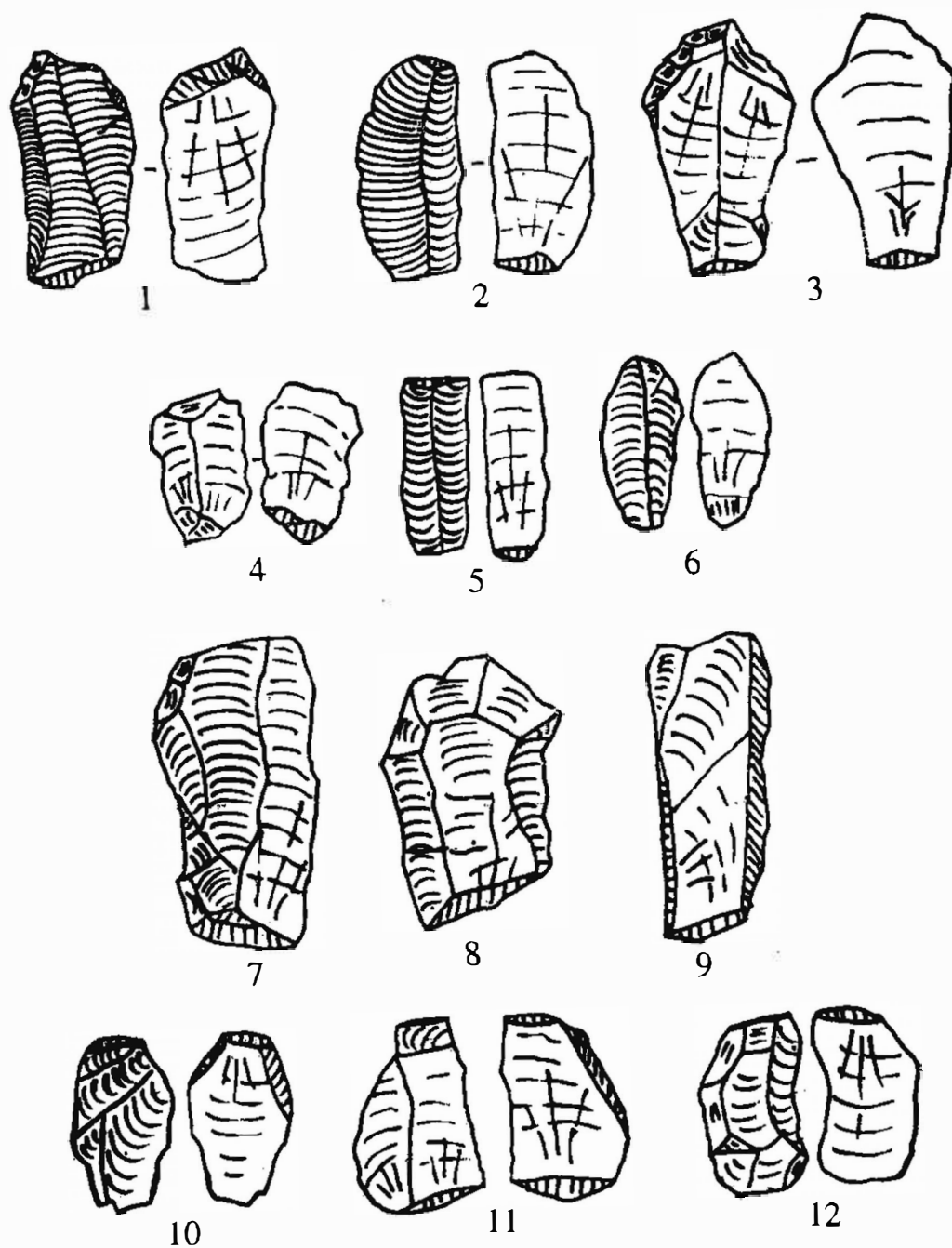


Fig. 19

Period III

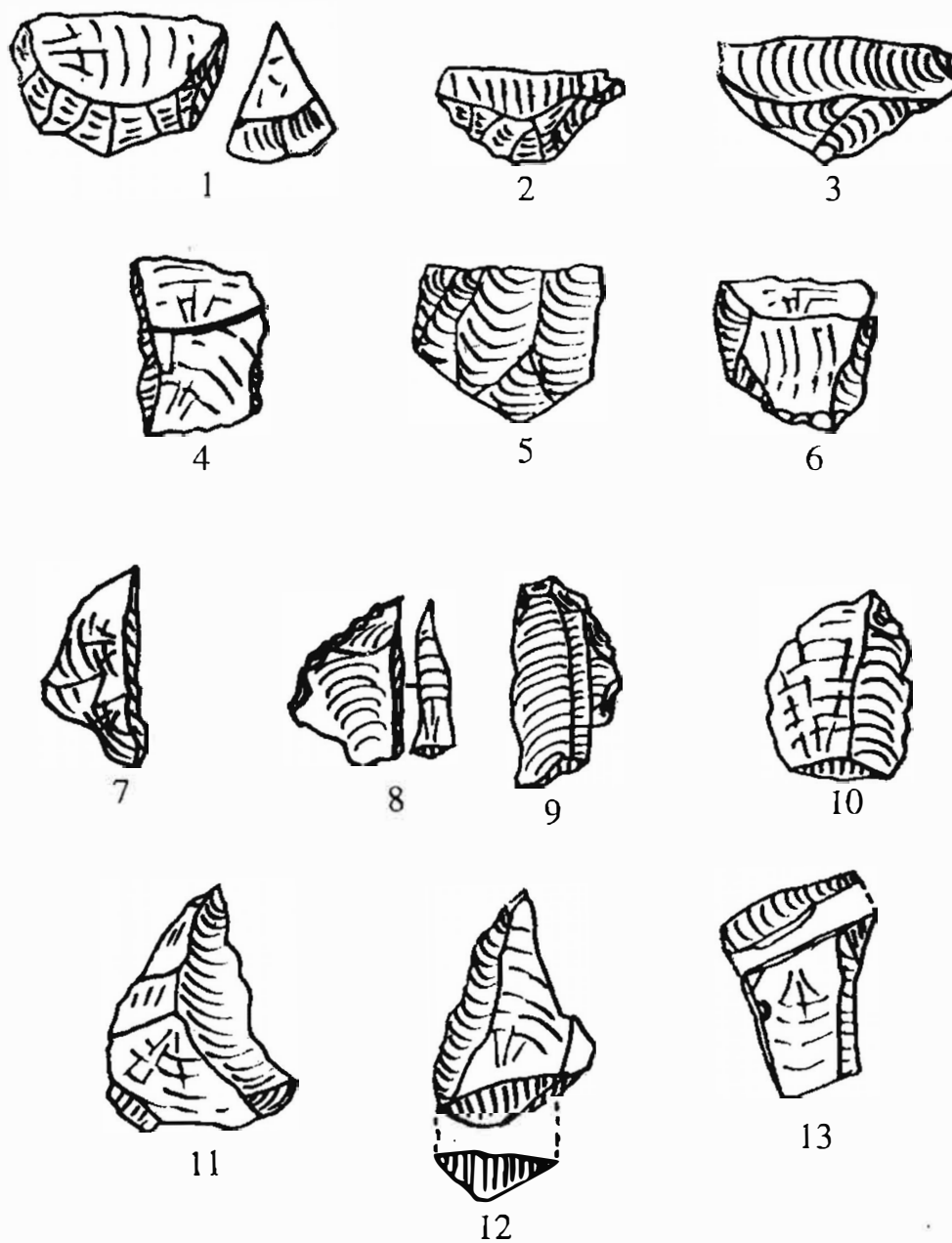


Fig. 20

Period III

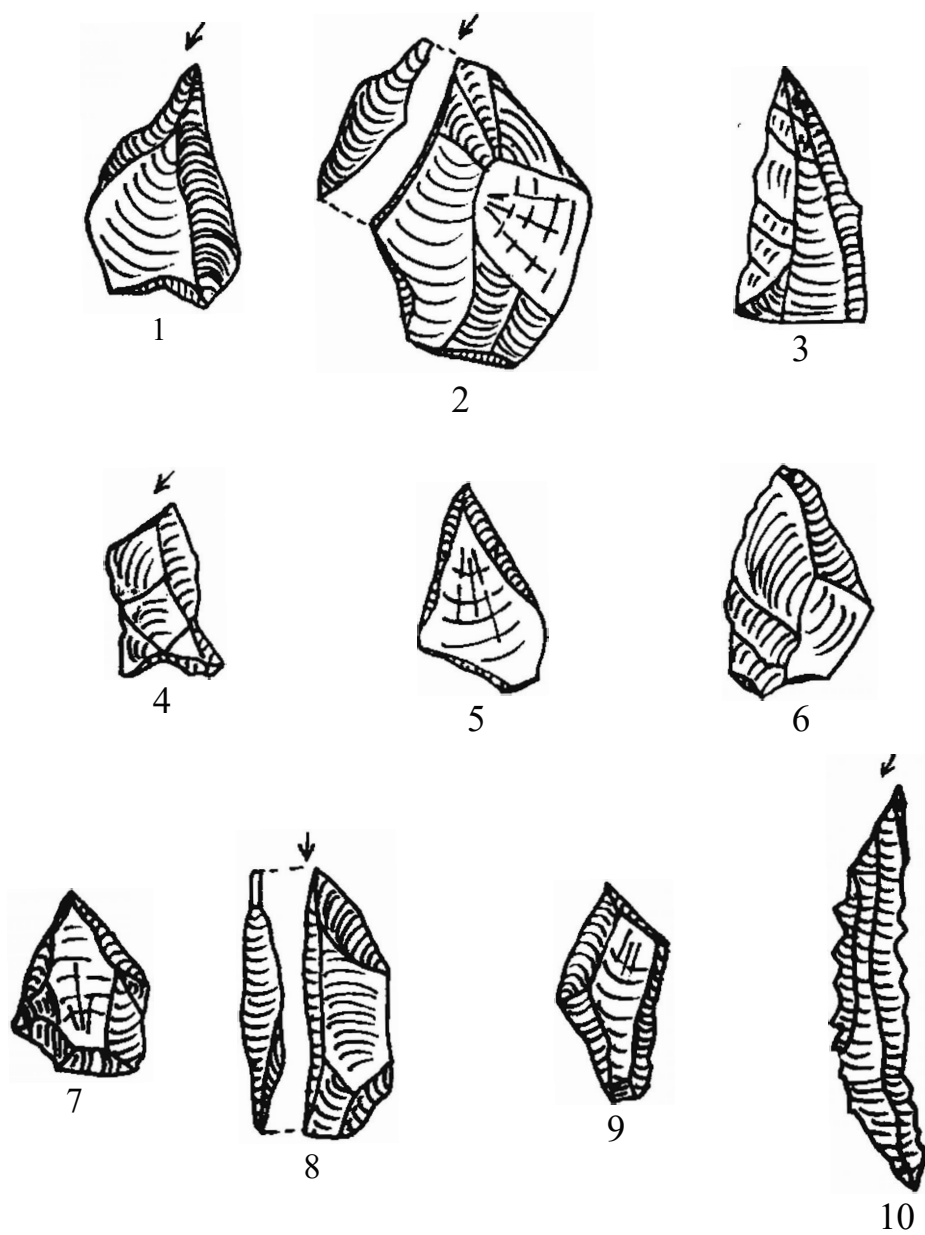


Fig. 21

Period III

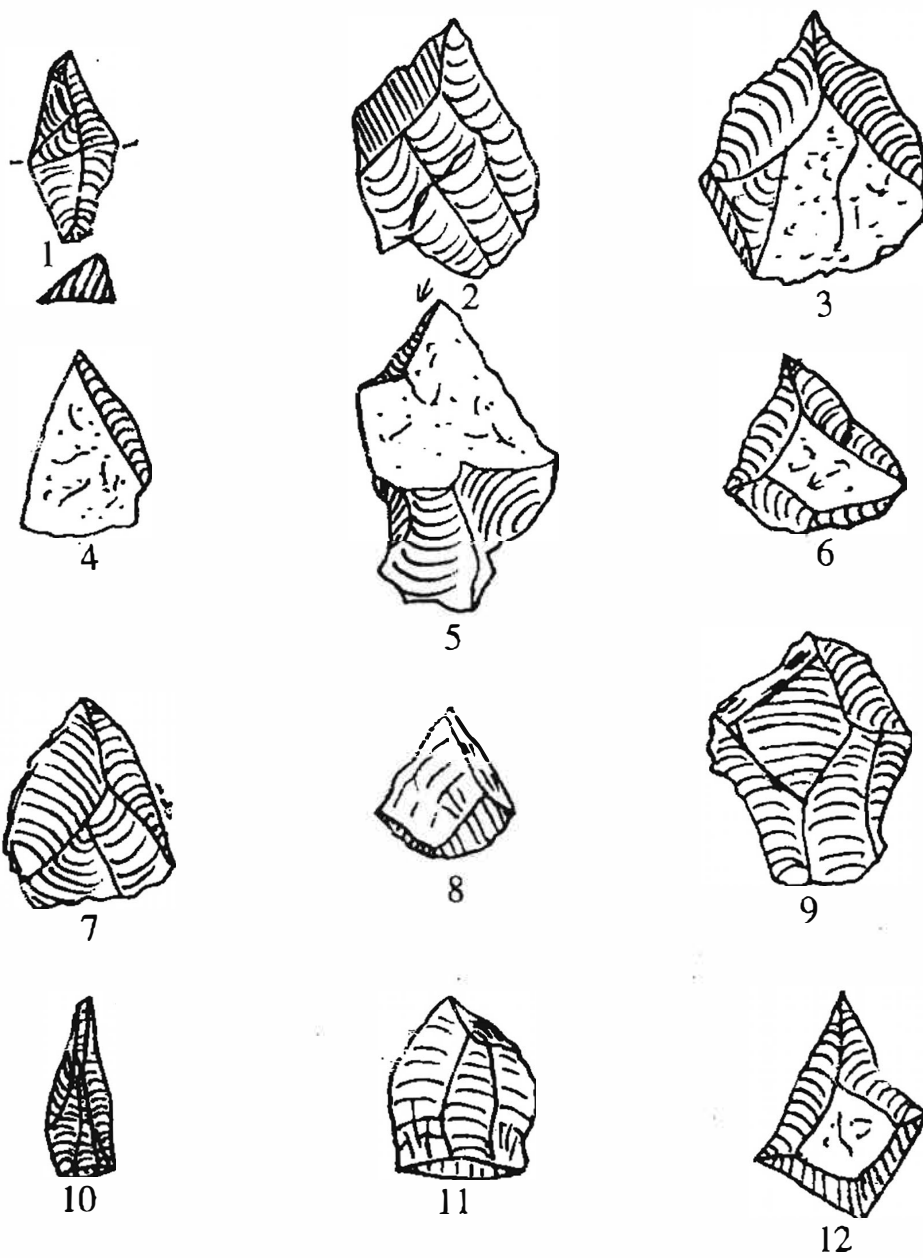


Fig. 22

Period III

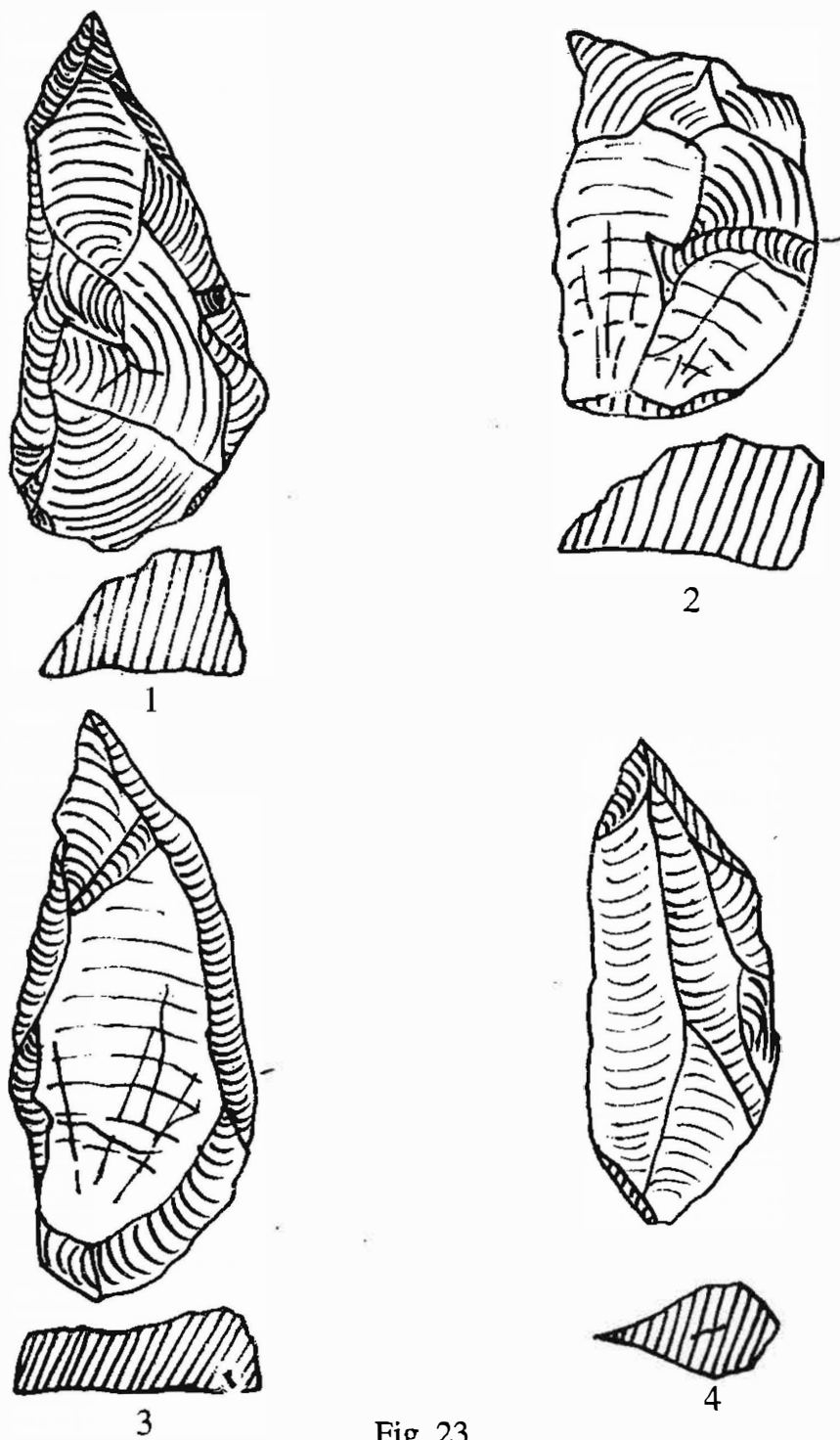


Fig. 23

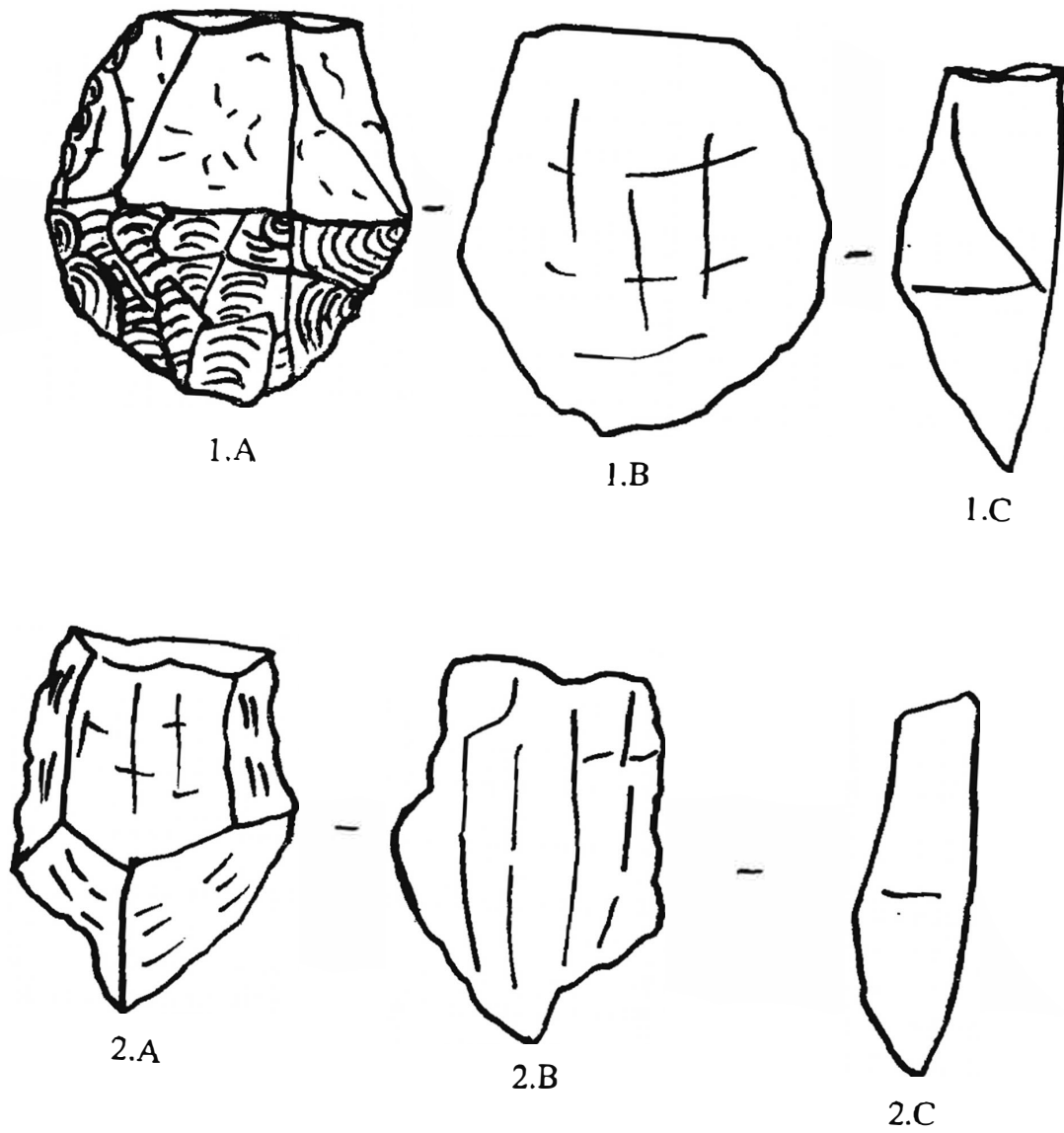
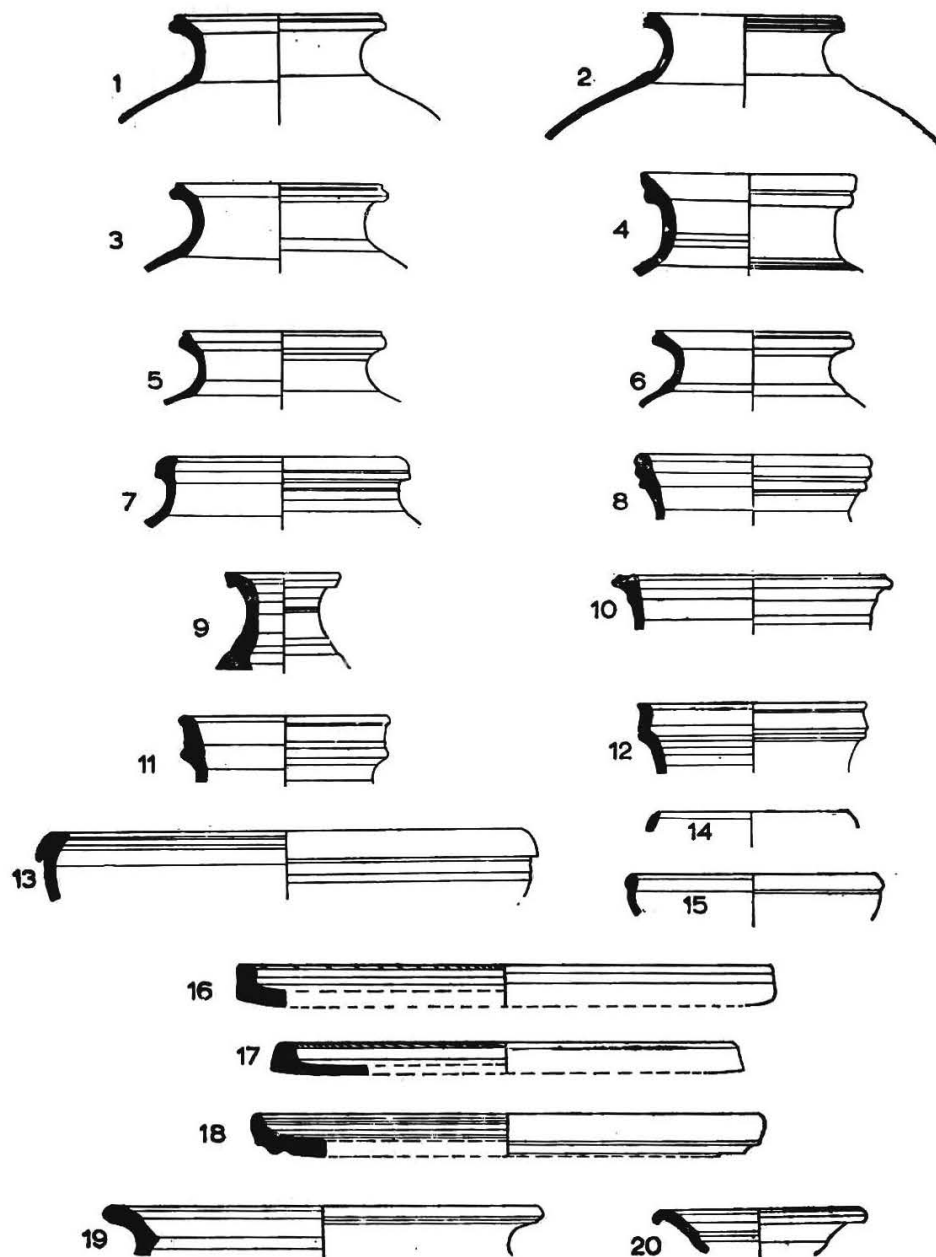


Fig. 24



SANGHAO POTTERY

Scale of Inches
1" = 1"

Fig. 25

of stone found in the Malakand ridge. In the Malakand Agency and Swat state even today this stone is quarried for house building purposes. The pebbles must have been picked up from the Khwar. They are of different shapes but fall mainly into two varieties: either rounded or flat on two faces. Only one example (No. 5) makes a complete ball. The centre of these stones is crudely chipped and has either a dimple or a rough scar the flat stones with the rough scars appear to have served as an anvil or a base for striking quartz flakes, and the round ones with a dimple could be used as hammerstones in a haft. These could be used for the application of blow on to the quartz modules.

Distribution in Gandhara

The quartz industry described above is not a preserve of the Sanghao cave. Such tools are scattered in the loamy soil of the entire valley away from the recent alluvium. As has been pointed out before, no tools have been found in the excavation of the recent alluvium outside the cave. In this very valley in Rod canyon there are two more caves, and in Bagh-darra there are two small caves overlooking a small *Khwar*. In Tangai canyon some more caves are seen high up the main range of hills. About three miles away to the south of the Parkho-darra cave is the village of Babuzai (see map Fig. 1), over which stands the famous Buddhist cave of Kashmir-smast. On the lower range in a shallow trough-like formation of Babusar some more caves have been located. All over this region quartz flakes are scattered. Still farther south at Jamalgarhi Col. D.H. Gordon¹⁰ discovered a cave, 300 yards east of the Mardan-Katlang road. Unfortunately tools found near the cave are not illustrated. Later he gives further information: "The flakes, which are found on the sloping approach to the cave, are of opaque white and semi-translucent banded quartz and of black indurated shale. The quality of the flaking is poor but most of the material is coarse and makes rough tools. So far, up to a considerable distance. It has not been possible to trace any other site showing even an approximation (no longer true now) to a microlithic industry, and three more caves in this neighbourhood yielded no flakes at all; in fact up to the present the Jamalgarhi cave remains the only known microlithic site in the N.W.F.P."¹¹ The cave has been revisited by us and the quartz tools collected from its vicinity. The tool types from this collection repeat those found in period III in the Sanghao cave. Gordon included them among the microlithic tools probably because he had no comparable material available to him. If his collection of tools is of the same nature as we have got, and there is no reason that there should be any difference, they could be easily associated with the Sanghao industry.

In between Jamalgarhi and Takht-bahi on the same Paja Hill, in an isolated hillock near the village of Katigarhi about 7 miles east of the main Mardan-Malakand road, three more caves have been located. They also produce the same kind of quartz tools. Across the Malakand Range similar quartz tools have been collected in the open fields at Thana, Chakdara and as far as Mingora in Swat state. A newly discovered rich site lies to the north of the town of Timargarha

10. It was first published by M.E. & D.H. Gordon in their article 'Survey of Ancient Gandhara' in *Journal of the Indian Anthropological Institute*.

11. D.H. Gordon - *Prehistoric Background of Indian Culture*, Bombay, 1958, p. 19.

in Dir state. All over this valley right up to Bajaur the quartz flakes are found in the open fields.

The distribution of these tools in the whole of the northern part of Gandhara clearly brings into view the general environment of these flake using people. They, no doubt, lived in the caves wherever they were available but they also hunted games in the small and narrow valleys, and they moved up and down these valleys across the hills and hill slopes in chase of smaller variety of games whose bones have been found in the Sanghao cave. Their location on the southern and northern sides of the Malakand Range suggests that these people migrated from the north into Peshawar valley. They appear to have moved in the same areas where later the Buddhists came and settled, and most probably they moved along the same routes. It is mainly in the track of the Buddhist ruins that we have been able to locate the prehistoric sites. It is hoped that the future search may widen the area of these people.

Comparison and Conclusion

It will be well to recapitulate the main features of the Sanghao industry before seeking comparisons. This industry is predominantly a flake and blade-flake industry including mainly different varieties of scrapers, graters or burins and very rough kind of points made on either triangular flakes or blades. The flakes are struck from prepared cores, mainly tortoise and discoidal. The angle between the platform and the flake scar appears to be right angle. The faceted platform technique is well attested. The tendency towards triangular shapes clearly points to the Mousterian tradition. The triangles are again struck from the prepared cores and show convergent flaking with a tendency to leaving a central ridge. Though secondary flaking is attested, minute retouch are rarely observed. Notches are seen at the lower end of the tools for haft. Among the scrapers the knife blade and the leaf-shape are well-designed. There are quite a few local varieties, the most important being semi-circular scraper, fan-shaped scraper and rhombos-shaped scraper. The tendency from period I to period III is to reduce the size and to produce better worked tools but the bad quality of the raw material was a great hindrance. On the first look the period III tools show greater affinities, particularly in size, with the microliths. It is for this reason that Gordon called the Jamalgarhi tools microliths, and we also in our first notice¹² treated them under the same name. But the typology and the technique of the tools from top to bottom are so similar that period III tools may be a later survival of period I but following the same Mousterian tradition. As pointed out before (in the section of Excavation), there is definite evidence of some lapse of time between period I and periods II and III. However, the tools show one homogeneous tradition, and if we bear in mind the nature of the raw material, the tradition can be referred to the Levallois-Mousterian heritage.

The nearest comparable material comes from the other side of the Indus in the Potwar region, where flake tools were collected by the Yale-Cambridge

12. A. H. Dani, 'Prehistoric Pakistan', in *Journal of the University of Peshawar*, 1963.

team and now described by Mr. Paterson¹³ under the title "The Clacton Invasion". He makes two groups: Upper Clacton A and Upper Clacton B, and attributes them to the Upper Potwar Loess, which presumably is coeval with the Younger Loess of the Peshawar valley. The flake tools illustrated by him in his figures 42 and 43 can be easily matched from the Sanghao finds, with the only difference that at Sanghao retouch is very rarely seen. The convergent flaking, talked of by Paterson, is amply evidenced at Sanghao. Paterson calls this industry an intrusive element as he correctly distinguishes it from the upper Soan but in the past no such distinction was made. However, now with the discovery of a widely scattered zone in Gandhara where this industry is attested, its source is easy to determine.

Further west in Afghanistan the Italian Archaeological Mission through its representative, Prof. Salvatore M. Puglisi¹⁴, has been able to locate open air sites at Hazar—Sum (Samangan). He writes: "Human presence even during the interstadial stages of the last glaciation is not to be excluded — the scattered implements of a Levallois and Mousterian technique are here significant. The lack of Gravettian may be equally indicative of a particular climatic-environmental situation. Local industry mainly reflects the clactonian technique: large flakes (used for various purposes) as well as medium and small-sized ones, and laminar flakes (usually thick) are all evident. In nearly all these implements the large bulb of percussion may be noted with the typical, slight, radial fissures. The angle formed between the flake surface and the striking platform is normally obtuse. These implements have no definite shape; their edges reveal clear, vigorous retouches that sometimes form denticulation. Along some edges inverse retouches have been obtained. A number of pointed-carinated type are noteworthy as well as some implements with retouched concavities which bespeak the use of bone and wood for the making of sharp weapons, and a few big flakes with straight edges or pointed ends with large retouches for use as handaxes or cleavers. The biggest series of implements is made up of side-scrapers, discoidal, scrapers, knives, and a few pointed flake-tools." Though the tool types of this region follow the same Mousterian tradition, they are much better and finer than the Sanghao examples because the main material used here is flint. If we can concede this change due to the change of the material, the Sanghao industry, in spite of the local varieties, can be attributed to the same Mousterian tradition.

If this change in material resulting in better workmanship is kept in mind, it is not difficult to find parallels in the tool types of Sanghao and in the tools found in the caves of Iraqi Kurdistan¹⁵ and Iran¹⁶. Particularly the triangular points and scrapers illustrated by Braidwood on his plate 25 have close similarities with the Sanghao implements. The Mousterian technical tradition in the two areas are further strengthened by cave dwelling and change in the living condition - a change from the stage of food gathering to that of "food collection" - a natural outcome from the habit of living in closed small valleys. This is partly due to

13. T. T. Paterson and H. J. H. Drummond, *Soan the Paleolithic Pakistan*, Karachi, 1961 chapter IX.

14. See his 'Preliminary Report on the Researches at Hazar Sum (Samangan)' in *East and West* (New Series, Vol. 14, Nos. 1-2) Rome.

15. Robert J. Braidwood and Bruce Howe, *Prehistoric Investigations in Iraqi Kurdistan*, Chicago, 1960, p. 60.

16. C. S. Coon, 'Cave Explorations in Iran 1949', Philadelphia, 1951.

the natural environment in the case of Sanghao or other parts in Gandhara. Here the Middle Stone Age man had not to go far in the chase of games in the open fields but on the other hand he had to wait in his own den until the games came within his easy reach to be shot and collected and brought into the cave for general feast, as is attested by the large number of bones in the cave. Two more characteristics noted by Braidwood (p. 179) are "the probable beginnings of the hafting of weapons and conscious burial of the dead." While the second feature yet remains to be discovered at Sanghao in the coming seasons's work, the first is amply proved by a good many tools having notches at the lower end for hafting.

Observations¹⁷ have already been made in the past regarding the Mousterian sites, which occupy corresponding position on the northern fringe of the Central Asian massif. In the Oxus valley and eastern Iran.

Thus today a wider zone is available in Asia for the play of the Mousterian technical tradition in almost similar conditions of living and probably at the same time during some phase of the last glaciation. This tradition is now traced right into Pakistan on both sides of the Indus. Dr. Mrs. Allchin and others linked this up with the Upper Soan but Paterson rightly treated it as an Upper Clacton intrusion in the context in which he was discussing. The new finds in Gandhara place at our disposal the materials which will lead to a new perspective and a new study of the entire Mousterian complex in western and southern Asia.

The link on the Indian side is very difficult to trace as there is a great desert belt that separates the Middle Stone Age of West Pakistan from that of India.¹⁸ Dr. Mrs. Allchin has sought to trace the link in the following way: (De Terra and Paterson have pointed out that certain flake tools from the Narmada are comparable to Late Soan tools from northern Pakistan, as defined by them. We are now in a position to reverse this, and say that the Late Soan falls typologically within the range of the Indian Middle Stone Age. de Terra and Paterson go further, and claim that the deposits which contain the Late Soan tools are contemporary with the second aggradation phase on the Narmada). The question of their relationship is a difficult one, as the two deposits are laid in quite distinct environmental regions, one north and the other south of the desert belt. None the less the typological comparisons, in my opinion, is a valid one and in itself implies contemporaneity. (Thus the Late Soan extends the distribution of the Indian Middle Stone Age north of the desert belt into the southern foothills of the Central Asian Massif).

This position no longer holds good in view of the fact that Paterson in his latest publication has distinguished the Late Soan from the "Upper Clacton". It is not the Late Soan which typologically falls within the Indian Middle Stone Age technical tradition, but it is the Upper Clacton industry with which the Indian

17. Cited by Mrs. B. Allchin in 'Indian Middle Stone Age' *loc. cit.*, p. 33.

18. For the Indian Middle Stone Age see B. Subbarao. *The Personality of India*, 2nd ed., Baroda. 1958, pp. 64-67; S.C. Malik, *Stone Age Industries of the Bombay and Satara districts*, Baroda. 1959; B. Allchin, *loc. cit.*; V. D. Krishnaswami and K. V. Saundarajan, 'The Lithic Tool Industries of the Singrauli Basin' in *Ancient India*, 7, 1951, pp. 40-66; H. D. Sankalia, *Prehistory and Protohistory in India and Pakistan*, chapter II, G. C. Mohapatra, *The Stone Age Cultures Of Orissa*, Poon, 1962. pt. III, section VIII.

Middle Stone Age materials can be related. This industry is now known to have had a wider circulation in West Pakistan and had a direct link with the stone age sequence of Western Asia. It is from that very source that the Indian Middle Stone Age has to be derived through the intermediary of Pakistan. It is no use giving an independent and secluded life to the people in India even at this stage. It is just possible that future excavation at Sanghao may bring forth the anthropological evidence to establish the particular race of man who was responsible for the spread of this culture in this part of the world. Time and patience and more work on a concerted basis alone can reveal this phase of the history of man in Pakistan and finally give a place to him in the onward march of humanity.

Distribution of stone vases and

